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Psychological Bulletin

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JOHNS HOPKINS UNIVERSITY

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VOLUME III, 1906

Containing the Literature Section of the PSYCHOLOGICAL REVIEW

PUBLISHED MONTHLY BY
THE REVIEW PUBLISHING COMPANY
41 NORTH QUEEN ST., LANCASTER, PA.,
AND BALTIMORE, MD.

AGENTS: G. E. STECHERT & CO., LONDON (2 Star Yard, Carey St., W. C.);
LEIPZIG (Hospital St., 10); PARIS (76 rue de Rennes).
MADRID: DANIEL JORRO (Calle de la Paz, 23).

Entered as second-class matter January 21, 1904, at the post-office at Lancaster, Pa., under
Act of Congress of March 3, 1879.

86249
28/3/08



PRESS OF
THE NEW ERA PRINTING COMPANY
LANCASTER, PA.

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THE PSYCHOLOGICAL BULLETIN

THE DIFFERENCE BETWEEN THE MENTAL AND THE PHYSICAL.

BY PROFESSOR G. M. STRATTON,

Johns Hopkins University.

The important discussion which has been in progress of late concerning the nature of Consciousness¹ has stimulated all of us to criticize our opinions upon this topic. And while it seems as though everything pertinent to the matter must already have been said, yet one may perhaps be forgiven for offering an additional account. I feel strongly that progress would be easier if the problem were divided; and so I shall consider separately two questions which are prominent in the papers I have referred to:

- (1) *What is the distinction between the physical and the mental field? and*
- (2) *In what respect, if at all, is consciousness different from the field marked off as mental?*

Only the first of these questions will be taken up in the present paper; the other will be treated in an article which I hope will follow. There is also this farther limitation in the present case, that I shall try to avoid entirely the genetic problem. The question for us, then, will not be, What are the factors which have influenced the race or the individual to distinguish between the mental and the physical world? but rather, What is that statement of the difference, which, with our accumulated knowledge and critical apparatus, seems most exact and satisfactory to us now? Not the origin and history of the distinction, then; but the actual difference, so far as we can at present make it out.

¹ Among other articles, see: James, 'Does Consciousness Exist?' *Journ. of Philos., Psychol. and Scient. Methods*, I., 477; Woodbridge, 'The Nature of Consciousness,' the same journal, II., 119; Montague, 'The Relational Theory of Consciousness, and its Realistic Implications,' *ibid.*, II., 309; Bush, 'An Empirical Definition of Consciousness,' *ibid.*, II., 561; Perry, 'Conceptions and Misconceptions of Consciousness,' *PSYCHOLOGICAL REVIEW*, XI., 282.

Moreover, my aim is not to formulate the difference between thought and its objects in general, but rather to state the difference between two groups of those objects, — between that group which we call physical things, and that other group of existences (also, without error, to be called ‘objects’) which we recognize as psychic or mental. Without more preliminary, let me pass at once to what seems to me the answer to our question.

Mental and physical existences are to be distinguished by their behavior, and ultimately perhaps by their behavior only. To start with, and at the risk of seeming to use a mere tautology, we may say that physical things are those which act like physical things, while mental facts are those that act as if they were mental. This means that we shall not succeed in identifying the one or the other by some fixed and peculiar mark which each displays. We cannot, by observing the object while merely passive, discover its proper class. We must see it in action, and carefully note its mode of conduct, its governing laws; these and these alone are the absolutely certain basis for distinguishing one group from the other. And by its mode of action, we must understand not its action when the object is taken in isolation, but its way of influencing its associates, the response it makes to this or that surrounding, the circumstances in which it comes into existence and changes and disappears.

This criterion has the virtue which, as we shall come to see later, the social criterion possesses also in some degree — the virtue of being a direct translation into theory, of a method which practical life constantly employs. If we are in doubt whether the door-bell really rang or we merely imagined the sound, we decide perhaps by going to the door or by waiting to hear whether it will ring again. The physical ring occurs with some one at the door and, if unanswered, usually comes again. The purely mental ring comes in a different setting and has a different consequence. Or in the case of vision, when I look at the paper on my desk I say that I have before me both a psychological fact and a physical fact, because there are two things which behave in different ways. The psychological fact, the visual appearance, may be destroyed by a mere wink of the eyes, and called into life by opening them. The physical object can be destroyed by fire, and I do not know how it can be restored at all. The test by action, by the governing law, is not a matter merely of fine-drawn speculation; it is a test constantly employed in life.

But when it is said that the difference between mental and physical objects is found, not so much in their inherent qualities as in their

manner of acting, — not so much in what we might call their morphology as in their physiology — the first impression might be that this difference of action will be found in the fact that physical objects have a regularity of behavior which psychical objects lack.

It is doubtless true that, speaking in the rough, our mental phenomena show a fickleness that contrasts with the physical objects' obedience to law. This fickleness, however, is hardly inherent in the facts themselves; it is rather the projection of our intellectual confusion with regard to them, our failure to understand their law. As believers in the orderliness of the world, we must assume that mental phenomena are, in fact, as regular as are physical objects. Their behavior, we believe, can ultimately be expressed in general laws. And while these laws are exceedingly difficult to discover, yet difficulty is but a relative thing, and will serve as no final distinction between the two realms.

Nor — to express much the same thought in a slightly different way — is it true that a physical occurrence has regular antecedents and consequents, while a mental occurrence has not. A thousand dollars in the bank can do something; it can start a chain of events which will go on indefinitely. An imaginary bank-account, we might be inclined to say, is impotent, it sets nothing going, it has no regular effects. But in scientific exactness, of course, this is not the case. The imaginary bank-account has quite as real a chain of consequences as has an actual credit at the bank. It produces an effect both upon its possessor and upon the world at large, though its effect is different from that which flows from what is physically real. To its deluded owner it gives a sense of security and power, it influences his purchases, it affects his attitude toward the persons he meets. They too act toward him in a way which shows the effect upon them of his delusion: they perhaps believe him to have the money, or they humor him in his error, or pity or deride him. The world within and the world without is thus modified from this purely mental source. But just because the consequences are so different, because the phenomenon runs so peculiar a course, do we class it by itself and call it a mental fact. So too an imaginary illness has consequences, quite as truly as a 'real' disease. But the physical sickness has accompaniments and sequelæ which are different from those of the imaginary sickness. It must be cured by special means, it runs a different course. The two orders of occurrence, the physical and the mental, differ not by reason of the presence or absence of effects in general, but by reason of the different kinds of effects which they produce.

But if one were now to ask that the enquiry be pushed farther and some statement given of the particular kind of conduct which should mark the physical, and the special kind that should mark the mental, then the best that we can say would surely fail to satisfy those who wish some final and definite answer. For at this point we should be forced to make a general reference to the detailed discoveries of the physical and the mental sciences. These are the systems whose very office it is to give us just this knowledge, to tell us exactly what are the peculiar habits of physical objects and what the habits of mental things. There is no other way of telling accurately how they do behave; these sciences are the organized answer to our very question. And the answer will never be complete until science has done its perfect work.

But out of the partial results which science already gives us, certain general differences could doubtless be extracted if one had the knowledge and the patience for the work. Thus we might even now say that physical objects display — not a permanence, exactly, as is often said; for lightning and thunder are as transitory as is anything mental — but physical things usually display a kind of connection, or continuity, which is of a different form from the continuity of our mental objects. When a physical thing changes we can usually discover some representative of it still remaining; a building burns, and a heap of bricks and ashes is in its place; riches take wings, but there is still the thread-bare gentility, the mortgaged estate, the one faithful servant, to remind one of what has been. But when a dream passes away, we may fail to discover any remnant or representative of the fact itself. Some fragmentary memory of the dream may come again; and although, in the interim between dream and recollection, there is doubtless some bond of connection — some ‘disposition,’ let us say, — yet we cannot actually experience any continuous connection, nor can we well imagine what would be the suitable phenomenal intermediaries between our disjointed mental acts. The same thing is seen from another side when we notice the quantitative equivalence which many physicists would say is an essential part of causal connection. But any such quantitative equivalence is highly uncertain in the case of mental causation; so that the fundamental form of the connection, the causal law itself, is doubtless different in each of these different fields.¹

So much by way of illustration of what would be necessary if one

¹ The outline of a discussion of this point, under the title of ‘Modified Causation for Psychology’ will appear in the proceedings of the recent meeting of the American Psychological Association at Harvard University.

were to work out in detail the principle here adopted. It is empirical; it simply elaborates the results of observation and experiment. Let us now consider whether this whole account is not uncalled for; whether its work is not better done by what has recently been offered by others. Let me, then, take up briefly some of these other views.

"The field of psychology," says Dr. Perry in the article already cited, "comes into view only when an incomplete experience is recognized as such from the standpoint of an experience regarded as objective. The corrected or discredited experience so determined critically in an experience of things, is regarded as merely my experience. . . . These psychical data cannot be called things or reals in the same sense as the standard objects, for they are completed and replaced by the latter." Whatever thus reveals its imperfection is regarded as psychic; that which has not been so discredited plays the rôle of 'thing' or 'real.'

I am not sure that Dr. Perry intended 'thing' or 'real' here to be understood as *physical* reality; it is possible that he is using 'reality' in some wider sense. So that what I shall say is not intended to be a refutation of his doctrine, but is aimed simply to show that it is no sufficient answer to the particular problem with which this present paper deals. Genetically the discovery of inadequacies has doubtless been of influence in marking off the psychic field; but the psychic field is not completely and finally marked off in this way and in this way alone. I have many experiences which have never been discredited, but which nevertheless I persistently regard as 'my experience' and as psychic. For example, I do not see but that I must regard my intention to take a suburban train this afternoon as a psychic datum. And yet, in order to recognize it as psychic, it has not been necessary to discredit it or to recognize its inadequacy. So far as I can see, my present intention to take the train is an entirely adequate and appropriate act for me to perform. I may never carry out my intention, it is true; but whether I do or do not, this in nowise affects either the present or the subsequent status of my intention, so far as its presence or absence from the field of psychology is concerned. Or, to take another illustration, shall we say that Shakespeare's *Tempest*—as a purely imaginative fact, apart from stage or paper, ink or voice—is adequate or inadequate, discredited or the reverse? *Æsthetically* it certainly has not been discredited; and if we say that physically it has, and that for this reason we regard it as psychic and not as physical, this amounts to saying that we regard as mental all those things which differ from the physical—a statement which perhaps is true, but which furnishes us hardly the light we seek.

The doctrine espoused by Dr. Bush, that consciousness is the field of things private, while the physical world is the realm of public experience — a view familiar to the readers of Ward, Royce and others, — is deserving of a more careful treatment than would here be possible. But to express at once the difficulty I feel with this doctrine, there are innumerable experiences which we share with one another, but which nevertheless we regard as mental and not as physical at all. And if this be indeed the case, this *social* criterion does not sufficiently distinguish between the two worlds. To take up first the cases which are less significant, there are many well-known illusions which are common to all normal persons, the familiar space-illusions of Zöllner or of Müller-Lyer. While in all such instances there is a physical basis for the deceptive mental occurrence, yet there is a mental twist or distortion of the facts which has no existence except in our minds, while taken just as experiences or phenomena they are no more private than are those which we regard as physically real. To some persons there might seem more point in adducing examples that were less clearly due to aberrations in the organs of sense, — instances where a whole company is deceived by sleight-of-hand, or by more potent forms of suggestion like those in hypnotism. Hindoo fakirs are probably capable of making an entire group of people see a mango tree grow in a few minutes from seed to maturity — an experience which is real enough, and is social, but whose objects have a mental reality only and no existence in the physical world.

But the phenomena which seem to me most difficult to reconcile with the social distinction of mental and physical things, are not confined to the abnormal side of mind nor to circumstances where the mind is baffled or ill-adapted to its surroundings. The sanest and most solid portions of our experience seem to me to lead to a like result. One cannot but feel that for the English-speaking people, *Paradise Lost* is a community experience, is community property, in no very different sense from that in which we say that Niagara Falls or Westminster Abbey is a common possession. Not every one of our race enters into actual possession of the poem, nor indeed do all partake directly of the Falls or Abbey. But there the poem stands, like the physical objects, ready for any who will pass through the various conditions necessary for the experience.

We enter into the world of Milton through a physical gateway — through paper and ink and physical organs. But once we are within, we find ourselves viewing a purely mental creation, and one whose effect upon us is heightened by the thought that what we are in the

presence of is nothing personal and private, but is a common heritage of the race. In this sense, all the great mental achievements of mankind, not in the realm of art alone, but in science, in politics, in morals, in religion, are not private experiences merely, but are parts of our common world. We live and move in them as we do in the common air.

Nor are our social possessions confined to lifeless constructions of art, or to impersonal systems like those of morals. Persons themselves we hold in common. Lincoln belongs to the nation as truly as does the Capitol; and not the physical Lincoln merely, but the rugged soul of the man — his foresight, his patience, his faith in his fellow men. The world of communal experience is therefore immeasurably larger than even the infinity of the physical universe; it holds this, we might say, in the hollow of its hand.

The fact that an experience is public or is private seems to me, therefore, to give no sure indication as to whether it is physical or mental. We may pass on, then, to the view taken by Professor James.

Thought and thing, according to him, do not differ in their constituent qualities, but rather in their relations. Thoughts are not one separate group of objects, and things another. "The one self-identical thing has so many relations to the rest of experience that you can take it in disparate systems of association, and treat it as belonging with opposite contexts. In one of these contexts it is your 'field of consciousness'; in another it is 'the room in which you sit,' and it enters both contexts in its wholeness, giving no pretext for being said to attach itself to consciousness by one of its parts or aspects, and to outer reality by another."¹ Just as a point can exist at once in two distinct lines by being at their intersection, so in experience, he tells us, any given object can be taken in either one of two contexts — in that of my personal biography and in that of the history of the portion of the external world to which the object belongs. The two contexts seem farther to be distinguished by the fact that physical things show an energy of behavior which thoughts do not display. Physical objects *do* things and have constancy of action, while psychic objects are inert and erratic.

In so far as Professor James would distinguish physical and mental things by a difference in their mode of behavior, his view and the one presented in this paper are in perfect accord. The divergence begins with the attempt to describe the character of behavior characteristic of each group. When he says that physical things behave in

¹ Page 481 of James' paper already cited.

an energetic way, while psychic things do not, one cannot but recall the many inert things in the physical world — will-o'-the-wisps, thistle-down and rainbows, as well as the many energetic things in the mental realm — the mariner's error of reckoning, which brings shipwreck, or the broker's judgment of value, causing sales that range in the millions. The 'energy' of such psychic events need not at all depend on their 'affective' warmth, which is a border state between the mental and the physical, according to Professor James. They may be cognitive acts of the coldest sort. And as for psychic things being *irregular* in their causation and not simply without causal efficiency — being erratic as well as ineffectual, — what seems to me to be the truth on this point has already been expressed and need not here be repeated.¹ His view that the difference between thought and thing is a matter merely of context or relations is, however, more or less independent of these details in his doctrine and should be judged independently of them.

Just how far his distinction between 'thought' and 'thing' is intended to answer our question as to the difference between psychic and physical reality, I find it difficult to say. His illustrations at times indicate that he has our problem directly in mind. In viewing an actual room, there is, according to his view, a double context; as an actual room, it has a certain set of associates and a certain history; as a part of my field of consciousness, it has a different set of associates and a different history. But again, this same difference of relations, or of context, exists entirely *within* the mental field. A room merely *thought* of, Professor James tells us, has also such a doubling of connections, and may be viewed as 'thought' or as 'thing' according as we please to take it in one or another of these lines of association. And such an illustration leads one to feel that the doctrine here offered is not meant to distinguish the physical from the mental. For in the latter illustration, where the room is not seen but is merely thought of, both contexts may at the moment have no existence except in thought. Let us suppose, to make this clearer, that I am thinking of a room in a distant city, and unknown to me the actual house has burned down some hours before. We may now distinguish between: (1) the real room, once existent, but now destroyed; (2) the room existent in my thought; and (3) my thought of the room — some wish or antipathy, let us say, with regard to it, together with all else that makes up the psychic process. We have here three facts and three contexts, with more to be added at will. The first is physical; the

¹ See p. 3 of this article.

second and the third are patently psychic, in spite of their distinguishable contexts. So that the doubling of contexts which permits us to see the difference between a thought and a thing, does not provide us with any clear distinction between a physical thing and a thing not physical. In the case of purely imaginary constructions of art, as when we think of King Arthur's sword, a multiplication of contexts may clearly occur without going beyond the psychic field.

But since in all these illustrations there is some reference to a physical context, some attempt to copy the relations of physical things, let us have at least one instance where even that is taken away. Suppose that I am thinking of a conclusion at which I arrived the day before. In recalling such an experience there is as clear a case of doubling, as though I were thinking of something I had seen. My *present thought* of my conclusion has its special connections — my interest of the moment, in using it merely as an illustration. The *conclusion thought of* has a totally different context — the feelings and interests which existed while the reasoning was actually taking place. We have here a clear contrast between the 'thought of something' and the 'something thought of,' but lying wholly within the mental realm, and without even a distant reference to physical things. So that Professor James' discussion of the contexts of thoughts and things undoubtedly is of the greatest importance in helping us to think clearly of the distinction between mental states and their 'objects'; but since these objects may be mental as well as physical, we are left without any sure criterion by which to distinguish between these two orders of fact.

With this we may close our survey. My own feeling is, that in spite of the penetrating work that has been done of late upon the distinction of mind and body there is still need for us to be up and doing with regard to it. And so I have ventured to give, in the earlier part of this paper, what seems to me a better way of distinguishing the two fields, namely by a difference in their modes of behavior, by a difference in their laws of action. My own offering is intended only to point out what seems to me the most hopeful direction of progress,—a kind of humble guide-post to help past one fork in the road, though even the right direction has cross-roads and fresh difficulties ahead.

PSYCHOLOGICAL LITERATURE.

PLATO ON THE SOUL.

Plato's View of the Soul. ERIC J. ROBERTS. *Mind*, N. S., 1905, XIV., 371-389.

Following Lutoslawski's classification of Plato's Dialogues,¹ Roberts gives us a very clear account of the development of Plato's view of the soul, and shows the various stages through which this view passed, from dualism to a kind of contradictory solipsism. The usual opinion concerning Plato's idea of the soul and its relation to the world of ideas is the dualistic conception which, as Roberts shows, is a point of view which Plato gradually changes as he reaches his later works.

In the earlier dialogues we have presented an external world opposed to the soul, and within this dualism a further schism takes place. The soul was regarded by Plato "as the subject of knowledge or of cognitive activity in general, and as the principle of movement or of life. For Plato meant by the soul that which exercises these functions and only with respect to them can its place in the scheme of existence be determined" (p. 372). As regards the world of existence this "was divided into two classes — on the one hand the world of true being, consisting of ideas, the objects of knowledge, and on the other hand the realm of becoming or generation, with which opinion, based on sense perception, was concerned. There is reason to suppose that this distinction was never abandoned by Plato, although he qualifies and supplements it in various ways" (p. 373). Connection of some sort exists between these two sets of dualisms, in that, according to Plato, the soul "possesses two quite distinct but equally essential characteristics — cognition and motion, of which the former connects it with the world of eternal reality, the latter with the world of ceaseless change. At the same time the soul has an identity of its own and is not merged in either world. It possesses reason in common with the ideas, motion in common with the world of generation; but this very fact that it presents features which unite it to the two opposite realms of existence at once is proof that its nature is to be distinguished from both" (p. 375).

¹The classification is as follows: First Platonic Group, Socratic dialogues, *Symposium* and *Phædo*; Middle Platonic Group, *Republic*, ii-x, and *Phædrus*; Later Group, *Theætetus* and *Parmenides*; Latest Group, *Sophist*, *Politicus*, *Philebus*, *Timæus* and *Laws*.

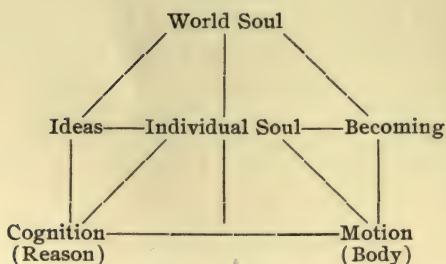
I venture to put this early standpoint of Plato into schematic form, following of course the presentation given by Roberts:



The contradiction here evident is well shown by Roberts. It is seen that the soul, in this scheme, has no place of its own, and seems to be 'lone wandering but not lost.' The soul would lose its immortality were it connected with the world of change or becoming, while, on the other hand, it cannot rank as a fixed and eternal idea, since it possesses the attribute of motion.

In this scheme it is seen that the disparateness of the various parts needs to be overcome. "Evidently there was need for a sort of 'Copernican change' in the Kantian sense of the expression, if any approach to a more adequate theory were to be made. And this is in fact what we find taking place in the later dialogues. The ideas by degrees vacate their position of transcendence and are seen to be dependent upon soul. Thus, as Lutoslawski puts it, 'the center of gravity of the Platonic system' changes, and it is to the soul, as the source at once of the ideas and of motion, that supreme reality is accorded. * * * A new investigation is undertaken, and the scheme of existence is gradually reconstructed, increasing attention being given to the subjective factor" (p. 378). In the later works of Plato, objects of knowledge become subjective categories, and the absolute separation of ideas and particulars is definitely rejected. Mind is considered as the final cause of all things, and the soul, as the originator of motion, leads to the natural extension of a universal soul, which orders and sustains all things. "The world-soul is described as a composite formation, a blend of all modes of existence and activity—ideal or archetypal ('undivided') and phenomenal ('divided') alike" (p. 381). While this conception of a world soul is logically a development of the notion of a personal soul, Plato seems to reverse the process and 'represents the human soul as somehow dependent upon the universal soul' (p. 383).

Again following Roberts' clear presentation, I once more venture to represent this 'Copernican change' as follows:



Concerning the immortality of the soul, Plato conceives this as belonging to *νοῦς* alone, and as being both 'individual' and 'personal.' The immortality which the soul has in virtue of its kinship with the ideas is qualitative rather than durational. "The existence of the ideas is eternal, *i. e.*, timeless and self-explanatory. To this the human soul can never completely attain; soul and body as indestructible have an immortality in time, but it is distinctly stated that they are 'not eternal,' as their nature is never entirely and absolutely at one with reason. Still, the more the soul by exercising her rational cognitive function upon the ideas brings herself into harmony with them, the more nearly does she become immortal in this highest sense" (p. 386).

As regards knowledge, in order to explain how the soul comes into contact with the ideas, we have the poetical hypothesis that it knew them in a previous existence before it became imprisoned in the body; a conception which is more poetically presented, I think, by Wordsworth's lines,

Our birth is but a sleep and a forgetting:
The Soul that rises with us, our life's Star,
Hath had elsewhere its setting,
And cometh from afar:
Not in entire forgetfulness,
And not in utter nakedness,
But trailing clouds of glory do we come
From God, who is our home.

The article of Roberts of which I have attempted to give some account is a very thorough bit of work and is worthy of careful study.

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PRAGMATISM.

Le Pragmatisme. C. DESSOULAVY. *Revue de Philosophie*, 1905, V. (7), 89-94.

M. Dessoulavy has given us a most concise and excellent account of the development of pragmatism, as thus far presented, and his short

article is also valuable for the number of references it contains. I may therefore be pardoned if I make a rather free use of his account, by bodily extraction and free translation.

As M. Dessoulavy says, and as is now rather well known, the term 'pragmatism' the title of the new system, first preferred by James, drew its origin from C. S. Peirce, who used the term in his paper of 1878, 'Illustrations of the Logic of Science,' *Popular Science Monthly*, Vol. XII., p. 287; but the system which bears the name pragmatism was outlined for the first time by William James, in his 'Philosophical Conceptions,' published, 1898, in the *Publications of the University of California*. Among the defenders of this theory soon appeared Schiller, who wrote in *Mind*, 'Useless Knowledge,' April, 1902, 'On Preserving Appearances,' July, 1903, in the *International Journal of Ethics* of July, 1903, in the *Personal Idealism* (Macmillan, 1903, essay 'Axioms as Postulates'), and also in his *Humanism* (Macmillan, 1903), in which the new title, 'humanism,' was adopted by him. He adopted this expression as representative of the pragmatic spirit, which in its common disapproval of intellectualism and pure irrationalism seems properly to belong to man, as a complex, according to Plato and Pascal, partly divine, partly brute.

Since the publication of *Humanism* have appeared Bradley's 'Truth and Practice,' *Mind*, July, 1904, James' 'Humanism and Truth,' *Mind*, Oct., 1904, Schiller's 'In Defence of Humanism,' *Mind*, Oct., 1904, H. W. B. Joseph's 'Prof. James on Humanism and Truth,' *Mind*, Jan., 1905, and finally William James' rather precise definition in the *Journal of Philosophy*, March 2, 1905. The religious aspect of pragmatism has been emphasized in the *Monthly Register*, Nov., 1902. In 1903, Vesey Hogue in a series of articles in the *Irish Ecclesiastical Record* laid stress on the religious side, and finally an anonymous writer treated the subject in a similar manner in the *Tablet*, Feb. 11, 1905.

We must look upon pragmatism as the culminating point of the philosophical tendencies which have become evident in the course of the nineteenth century, *i. e.*, of Kantianism, evolutionism, and of philosophic utilitarianism.

Discouraged by the (to him) insoluble antinomies of pure reason, Kant insisted on the superiority of the practical reason. As it happened, however, in wishing to perfect his system his followers finally came to divergent paths, and were even discredited by Kant himself. The environment was probably not of the furthering kind, and pure idealism and pessimism usurped the place of the young heir to philosophic thought.

"While the German professors argued in their fashion, that is to say, somewhat 'in the air,' the English philosophers, less metaphysical than their brethren on the continent, followed the national road of experience, and that experience, of the senses. This English philosophy, correct as far as it goes, has always been somewhat lacking, unfinished, imperfect, characteristics which have not been removed even when Darwin came to its aid with his system. In ethics we know that the English school has ended by identifying moral good with utility" (p. 90).

These two lines of development, Kantian practicisim, and English experience and utilitarianism, so diverse in their points of departure, are finally joined by the mediating position of pragmatism. Agreeing with Kantianism, pragmatism strongly doubts pure metaphysics; agreeing with evolutionism, it admits the provisional and tentative character of our intellectual faculties; agreeing finally with the English moralists, it identifies the two forms of ethical good (the moral and the utilitarian) and furthermore makes them equal to truth.

James was first led to his theory of pragmatism by the increasing multiplicity of systems, especially of metaphysical systems. As he says, 'There can *be* no difference which doesn't *make* a difference.' We must use our own judgment as regards the different systems, and select some basic principle which will stand testing and examination. This principle is the principle of end, of result, of effect, — τὸ πρᾶγμα. 'Truth is found in, is shown by, the result' (p. 91).

Kant has done great service by placing pure reason in a certain disrepute, and thus has 'cleared the way a little' for the growth of empiricism. Darwin has emphasized the principle of natural selection, which was suggested by the process of selection going on in men's minds. 'We keep what is useful, we abandon what is useless' (p. 93). Axioms and principles themselves must stand the test of selection and experiment. Pragmatism may here be distinguished from either empiricism, or classic *à priori*sm, because for pragmatism the first principles are neither the product of a purely passive experience (as the empiricists would have it), nor are they the result of laws unexplainable according to our mental structure. "When our experience suggests to us the utility of a given conception, we endeavor to find whether or not it is true; and if it is found in accord with the facts, if we are led to discover them, we believe in them, and our belief is increased in proportion as the utility of the hypothesis is proved more and more by the senses. Finally, when the given conception ceases to disagree with any fact, it changes its name and is

called a principle. It seems that it is only by means of such a reduction that we can defend the value of our principles, since the induction on which they are founded is far too incomplete; even the principles of contradiction and agreement are nothing but results acquired in this manner" (p. 94).

Finally, the new school agrees with the old scholastic, in that the latter, almost instinctively, has already expressed the equalization of *bonum* and *verum*. We too see that the good is useful, because being good for nothing is synonymous with being evil, and for the same reason the true is the useful. It is in this affirmation that pragmatism consists.

For its size, M. Dessoulavy's article is a gem, and my added remarks are supplementary more than anything else. I think it safe to add that a movement strongly aiding the others in the pragmatic direction is the psychological, under the guidance of Baldwin, Dewey and Münsterberg, of whom the second mentioned can hardly be left out in any discussion of pragmatism. The present emphasis of the motor side of any conscious moment, and the signification of the attitude taken in any explanation of meaning, offers a new interpretation of 'use' and 'practical' which will, I think, safely meet the objections put forth by Bradley and others. As far as I am able to understand the matter, a thing is of 'use,' not only when it is a means towards serial reaction, *e. g.*, shoveling coal, chopping wood, etc., but also when it creates in us an attitude, has for us a certain meaning. We need not throw conniption fits to establish an attitude. Any body adjustment which is felt as meaning, as tendency, is enough. It is in this light, so at least it seems to me, that the objections to pragmatism must be met.

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Pragmatism and Its Critics. ADDISON W. MOORE. Phil. Rev., 1905, XIV., 322-344.

This article might justly be called 'Critics of Pragmatism Criticized.' The term 'pragmatism' is used in its broader sense, the 'Studies in Logical Theory' serving as basis for much of the discussion. The main point urged by the pragmatist against absolutism, and one which has elicited but meager response, is that 'there is no connection between the absolutist's general definition of truth and error, and the standard actually employed in testing any particular judgment.' The two are irrelevant. Professor Creighton's paper on 'Purpose as Logical Category' makes one of the most direct attempts to meet this contention. But, although he allows with the pragmatists that in judg-

ing of truth the appeal is to experience as systematized by thought, partially fluid, in constant readjustment and search for guidance from every quarter, he solidifies his reality by referring to a system in which the present experience 'is completely fulfilled and realized.' No criterion of truth and error is here given, and even if it were, what connection could it have with a completed, fixed absolute? If the system is complete, wherein consists that 'correction and completion' to which he refers? Likewise, if it contains its own 'principles of criticism,' it must be subject to the change that criticism necessarily involves, thereby immediately becoming inconsistent with the idea of fixity. The truth that the mutual aid rendered by present and future to each other in determining reality, is possible only in a 'rationally coördinated system,' by no means involves the static character of that system. Its wholeness is not threatened by its organic quality.

Although some absolutists assure us that immediate experience has a degree of reality lacking in the 'merely ideal' and general experience, pragmatism has been charged with subjectivism through its use of such terms as 'immediate,' 'definite,' 'need,' etc. The attack arises from a misapprehension as to the implication of such words. 'Need' arises only in relation to a 'situation' which includes rather than is included by the individual consciousness. While Professor Pringle Pattison does not commit the error of interpreting 'situation' subjectively, he goes to the other extreme in calling it 'a real world independent of our ideas and unmodified' by them. But the unmodified in a situation is only that part of it the changes of which are not now relevant to it. Unmodified should hence be a relative term, not implying unmodifiable. The permanent or stubborn quality in habit 'constitutes half the stimulus to thought, the other half consisting in the fact that, however stubborn, habit is after all plastic.' Were it not, the fixity of that more-than-stubborn grain in experience would wither all effort.

The eleatic objection presented by Professor Bakewell in 'Latter-Day Flowing-Philosophy' consists in the slur that pragmatism 'resolves the world into sheer flux.' Though he agrees that the 'fixed itself must be conceived dynamically,' he still looks for an 'end,' 'a system of purposes,' 'a distant scene,' which if he regards as static (how else can we interpret these words?) exclude this possibility of a really dynamic conception. He should consider permanence itself as a function of experience, and hence a form of activity, correlative with the function of change within the self-activity. Between these two functions is a constant interchange of content.

The use of the word 'purpose' does not allow any escape from the difficulties of a static absolute. For the 'purpose' must be constructed in order to guarantee its appropriateness in a given situation, as well as any other standard. The construction and completion, as opposed to the idea of appropriation, of a purpose is possible in any given situation in spite of the infinite regress argument, just because its completion consists not in abstract correspondence with an absolute purpose, but in the way it gives outlet to the activities termed 'means.' It does not complete itself as an independent thing, but in thus providing this activity-outlet. In the case of conflict (the presence of which involves the absence of any complete purpose) between activities, there is no appeal to an ultimate previously determined purpose, but a struggle to construct a purpose. Our knowledge of gradually-matured constructions out of a wide range of social material, and their constant modifications, refutes the idea of ultimateness. The purpose through which this conflict finds its solution is merely that which gives the freest and most harmonious activity-outlet. What is permanent in purpose is an abstraction of the function of purposing. Nor does this test of completion in a 'sense' of freedom and harmony bring the taint of subjectivism when it is understood that this 'sense' is the issue of a long process involving as many minds and as much material world as the most insistent desire for objectivity could demand.

Another thrust is the charge of dualism, both of a genetic and an immediate kind. The former is founded upon a misapprehension as to the pragmatic hypothesis which regards habit and thought as correlative functions of self-activity. One is not parent to the other, thought is not a product of evolution, but an organic moment in that process. Each supports and is supported by the other. The charge of an immediate dualism upon those who constantly insist upon the interrelations between the various phases of experience by those who make thought entirely independent of the 'psychological situation' is singularly inconsistent. The absolutist with his 'independent thought' faces the really bald dualism. Difference in function, the pragmatist's dualism, can hardly deserve the name. And the difference between thought and the 'situation' is to be regarded as merely a functional difference, even in such staid sciences as mathematics, the stronghold of the pure-thought advocates. 'Practical purpose' and 'practice' have been ambiguously used by both sides, but according to the true pragmatist they cannot denote a material end, that being a contradiction of terms, nor yet a 'purely theoretical' problem,

since either as a process or an end such purity, involving entire exclusion of the physical, is impossible.

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PHILOSOPHICAL PROBLEMS.

The University of California Publications. Philosophy, Vol. I.

In commemoration of the Seventieth Birthday of Professor George Holmes Howison. Berkeley, The University Press, 1904.

Of this beautiful and stimulating volume, it is perhaps enough to say, in general, that in both form and content it honors the occasion which inspired it.

Professor McGilvary in the first essay discusses 'The Summum Bonum.' After a presentation of various current meanings, Professor McGilvary says, 'The problem before us is to determine whether there is any reasonable highest good for men at large.' Passing over much interesting detail to net results, the solution is found in the conception of 'the common good.' But this common good 'is not a good common to all human beings, but only to a group which constitutes a *community*.' How large the community shall be will depend on various conditions. Further this common good 'is not something ready-made, nor does it need to resort to metaphysical principles or theological considerations' to give an account of itself. A common good, a community ideal, grows out of: (1) the fact that in pursuit of the various individual goods common means such as police protection, etc., are needed; (2) 'the naturally altruistic nature of man—all normal men have at heart the good of some other beings than themselves'; (3) 'the contagion of desires'; (4) 'social pressure in the forms of teaching, preaching, etc.' The common good thus generated, in the constant maintenance and reconstruction of which the individual ultimately finds his own satisfaction, is, then, the Summum Bonum.

'The Essentials of Human Faculty' is the title of an interesting paper by Professor Mezes. On the psychical side the chief human differentia is found in the ability to construct alternatives, to ask double questions, to choose. And this is due: (1) to the development of free ideas, floating adjectives—a world of meanings *consciously* segregated from the world of facts; (2) to the development of the power of voluntary effort, the power of *consciously* reinforcing a weak or mastering a strong impulse. In the opinion of the reviewer voluntary effort is too much abstracted from the cognitive 'self' at whose 'bidding' and 'command' it is. Physically the *differentia humana* is

found in erectness, the attainment of which has necessitated changes in the hand, the jaw, the shoulders and spinal column, and the feet. 'Now note that this is a list that even in popular thought is significantly connected with effort and will power,' as shown in such phrases as 'loosing one's grip,' 'setting one's jaw,' 'having no backbone,' 'weak-kneed, flat-footed,' etc. In short, '*Voluntary effort, which makes possible choice our original differentia, turns out to be the psychic correspondent gradually pruned and organized of the physical strains and stresses incident to erectness which itself conveniently sums up the physical differentia.*' As the author suggests in a note, there are many points of attachment between the essay and certain doctrines of pragmatism.

In 'Some Scientific Apologies for Evil' Professor Stratton opposes the doctrine of the necessity of evil in experience. The 'contrast' or 'foil' theory demands only 'the idea of evil, not actual evil.' And if it be asked whence comes the idea, Professor Stratton suggests that the conduct of animals might furnish it. These antitheses of ideal and actual evil and animal and human conduct suggest certain difficulties which cannot here be developed.

But Professor Stratton goes further and says that evil is not necessary even in idea, since (1) psychologically and logically the contrasting content necessary for defining the good can be supplied by intellectual and æsthetic experiences. Definition requires not contradictory, but simply different content. [Some logicians will challenge this.] (2) 'From the standpoint of evolution, evil is not a lower level, as viewed from a higher.' The conduct of a tree, a bird, a child, are not bad, because immature. Yet we do condemn the person who, when childhood is passed, refuses to put away childish things. But Professor Stratton thinks, 'It is quite conceivable that life should unfold in such a way that our various instincts should always stand in such right proportion, in such mutual check and adjustment that our character throughout its entire course would give us a sense of perfect symmetry, in that all our powers would unite in work toward an appropriate end.' Why such an evolution if possible is not actual, especially since it is regarded as a revelation of God's character, Professor Stratton confesses still remains 'a mystery' and says we must look for a truer revelation 'in some inner light, some inner voice.'

If the conceptions of pragmatism which appear in Professor Rieber's paper on 'Pragmatism and the *A Priori*' be typical specimens of the fruits of pragmatic teaching thus far, well may the pragmatist despair. Some of the most discouraging imputations run as

follows: "The mind of man was *created by phenomena*" (p. 76). "Mind which the pragmatist puts last in the evolutionary series" (p. 77). "Thought being a function in the present situation *exhausts its entire meaning in that situation.*" "He (the pragmatist) gives a fundamental place to matter or that which is other than mind, and regards mind as simply episodic, *a mere attendant phenomenon* in the evolutionary scheme" (p. 80). "Following Spencer, those thoughts of ours which seem so irresistible are simply results of transmitted inheritance." "All professed pragmatists *admit* that it has its roots deep down in *Spencerianism*" (p. 87). "We pronounce it (thought) true if it contributes *to the existing order*" (p. 82). [Italics mine.] I am sure pragmatists would like to see chapter and verse for these attributions.

On some of these misconceptions, especially those concerning evolution, I have commented in the *Philosophical Review* for May of the current year. The charges of 'materialism' seem so far wide of any pragmatism I have seen or heard that there appears to be scarcely common ground enough to serve as a basis for discussion.

The *a priori*, Professor Rieber defines as "that primary, self-explanatory, category, or system of categories, which we must accept upon their own authentication as justifying all derivative knowledge and preventing its dissolution into universal scepticism." After such a Spinozistic statement it is not strange that Professor Rieber should discover that pragmatism has no *a priori*. It certainly has none of that sort. Indeed one would suppose that since Locke's and Kant's discussion of analytic judgments, it would be difficult to find even among absolutists many who would so frankly give the *a priori* such a character. Of such an *a priori* the pragmatist would at once ask: What can be meant by a category being 'its own authentication'? Does 'authentication' mean anything as applied to a content simply given? Does not 'authentication' require a relation to other experiences? And is not the 'authentication' of any category found not 'in itself' but precisely in the 'derived' experiences? Further, if there be a system of *a priori* truth, which is just all truth and nothing but truth, must there not be also a system of *a priori* error?

Though pragmatism is without *such an a priori* it still may have an *a priori*. The pragmatist's *a priori* is not a particular content or system from the womb of which all other knowledge is to be drawn; it is rather a certain *way* in which *any* experience is made to lead to other experience. It is not a divine autocratic prerogative of certain contents of experience to the eternal exclusion of all others; it is a democratic office to which any experience however humble may aspire.

The criticism of pragmatism is continued by Professor Bakewell under the caption, 'Latter Day Flowing Philosophy.' Professor Bakewell, however, sticks much closer to the texts of pragmatism than does Professor Rieber. As the title suggests, the main thesis is that pragmatism leaves no stable element in experience, but resolves it into 'a universal flux, into something 'utterly plastic,' 'something like a kaleidoscopic eye accompanied by a chameleon memory trying to grasp in view a perpetually dissolving field.' The individualistic and subjective characters of pragmatism are also noted as corollaries of its fluctuous nature. In the article above mentioned, I have discussed Professor Bakewell's main contention and have nothing essentially new to add here.

In general it is interesting to note the great difficulty and narrow margin with which Professor Bakewell himself escapes pragmatic conclusions, and that he succeeds only by hobbling pragmatism in certain cases with interpretations of will and desire to which no pragmatist would subscribe, and in others by falling back on an absolute *purpose* after a telling critique of absolutism in other forms.

The great desideratum of all modern voluntarisms, says Professor Bakewell, 'is to find a fixed' (p. 304). This is not to be found in substance regarded as either matter or mind. "Equally vain is it to seek refuge in a world of immutable ideas. Equally vain and verbal is the attempt to find the permanent in some mysterious psychical entity." Again, 'We cannot simply find our desired fixed by defining the nature of the will in terms of some ideal pattern, to which the individual will must conform.' Where, then? Professor Bakewell answers: 'The solvent conception must be sought in the notion of self-activity.' But where in self-activity is the permanent? It is in the element of purpose, plan. Here, however, the reader's perplexity begins. On the one hand we read that 'this is not any static plan, external to the process and constraining us therein.' This would seem to mean that planning, purposing, is a function of self-activity out of which arise specific plans and purposes. Nowhere is there here an absolute plan or pattern — all of which is very orthodox pragmatism. On the other hand, we read of the 'end toward which it (experience) tends' (instead of ends in experience), and 'in so far as that end can, as it were, be appropriated by the life of the individual knower'; and again, 'I must believe that there is a distant scene to which the steps as they come, one by one, are or may be surely leading.' And again we read of 'a system of purposes within which each particular purpose has its fixed place and relative value.' All these passages are

quite capable of a pragmatic interpretation. But it is difficult to resist the conviction that Professor Bakewell has no such interpretation in mind; that in these statements the 'end,' the 'distant scene,' the 'system of purposes,' refer to some fixed, final and absolute goal. Professor Bakewell apparently regards the subjective and individualistic characters of pragmatism as obvious corollaries, requiring no exposition.

'Some Problems in Evolution and Education' is the title of an interesting paper by Professor Henderson. Two conceptions, the significance of infancy and the non-inheritance of acquired characters, are especially significant for education. (1) A long period of infancy means the opportunity to acquire, not certain specific adaptations, but the disposition and capacity for adaptation. The supreme adaptation is the tendency to readaptation, to reconstruction. In the helplessness of the infant we find the freedom that is the parent of progress. (2) The non-inheritance of acquired characters is just what we should expect in an organism of long infancy. Infancy would lose its meaning, would be anomalous, if it were loaded with the habits of previous generations. The evolution of the capacity for adaptation means precisely the evolution of the non-inheritance of acquired characters. But as fast as this period of infancy and the non-inheritance of acquired characters develops, we observe the emergence of social heredity or education, which is defined as 'a process of conscious selection, a process by which whatever is of value in the past for present life may be appropriated without becoming a rigidly fixed habit or instinct.' How to secure in this material of the past such precision and definiteness as to be effective and still keep it open and free to reconstruction as new conditions develop, is just the problem of liberal education.

A paper on 'Philosophy and Science in Education' is presented by Principal Burks, in which he says that there 'cannot be a science of education because the facts involved are too varied in character and too widely separated in their relationships.' Nor can there be a philosophy of education, since its subject matter is a limited field of reality. It is too broad for science and too narrow for philosophy. However, philosophy may render great service by checking the fads and prejudices, the artificial issues, such as 'culture versus utility,' 'special versus general training,' 'interest versus effort,' etc., which the history of education and current discussion everywhere reveal. On the positive side 'the fundamental problems of education are identical with those of life,' and 'the philosophy of education therefore is nothing less than the philosophy of life.'

In a scholarly and well-written essay on 'The Dialectic of Bruno

and Spinoza,' Professor Lovejoy traces very clearly the philosophical pedigree of some fundamental difficulties of present-day absolutism. He shows how the attempt, first systematically made by a Neo-Platonism, 'to relate a simple perfect and immutable absolute to the universe of concrete, manifold, temporal experiences' results in a separation between the being, the *esse*, the that of reality, and its attributes, its what — the former being assigned to the absolute, the latter to finite experience. But this only befogged the problem for a time, and resulted in an oscillation continued unto this present day, between mystical appeals to the principle of *coincidentia oppositorum* as in Bruno, and the unmediated parallelism of substance and attributes as in Spinoza, or the degradation of the qualities to the level of an illusory appearance of the substance. Professor Lovejoy shows convincingly that the attempts to make Spinoza consistent by an idealistic interpretation of the attributes only makes him historically inconsistent, that in view of his heritage from Neo-Platonism and Bruno, Spinoza was committed as much to the differentiating substance as to the unified substance; to the substance in the qualities, as to the substance transcending the qualities.

The moral Professor Lovejoy points is the hopelessness of the attempt, not yet wholly given over, to make a metaphysic of an absolute absolute, which at the same time must take up into itself the successive and processive nature of finite experience. "In fine, to assert of an ultimate reality both its *transcendence* as regards its essence or distinctive predicates, and its *inclusion* of the whole *esse* of something defined as having an essence different from those predicates, is to adopt self-contradiction as the method of metaphysics."

Professor Stuart's paper on 'The Logic of Self-Realization' contains an acute criticism of rationalistic and ontological absolutism and a convincing account of the 'instrumental' conception of the self — of the self as 'an ideal of ethical *method*, not a contentual or descriptive ideal from which either the details or the generalities of right conduct are to be extracted.' After pointing out the value of Green's critique of utilitarianism and evolutionism, he shows how Green 'proceeds forthwith to the other extreme of proposing as an ideal a conception which in the end amounts to a wholesale begging of the question for all cases of true moral difficulty' (p. 180). 'According to Green the moral ideal is the infinite personality of the absolute self.' Therefore it might appear 'that the province of ethical theory should be the description of the content of this ideal.' But 'the expounders of this system insist that all human knowledge of the ideal must be

imperfect at any given time.' What then? We must appeal to history 'where the absolute is working out a progressive self-revelation' and where we can at least get the general line of direction. But 'how can we interpret history without that knowledge of the ideal which is declared impossible'? On the other hand, 'if it were impossible, the appeal to history would be superfluous.' Again, even if by faith we insist that history is a revelation, so far, of the absolute, aside from the problem of sin and error involved in such an assumption, how can the past, taken simply as a revelation of the content of the absolute, afford any moral guidance for the future which must bring new conditions? In short, this conception of self-realization is in the end 'but a kind of intuitionism grown self-distrustful.' On the positive side a true theory of self-realization must rest upon the following principles: (1) There is no ultimate ethical ideal admitting either of complete formulation prior to experience or of progressive formulation in the course of experience. (2) The actual coöperating factors in ethical deliberation are, concepts or standards corresponding to particular types of virtue and vice, and concrete particular ends of present desire. (3) The outcome of the process is a purpose or plan reached through a unification of these factors involving in a greater or less degree transformation of them all (p. 188).

But what determines the point at which this process of transformation through analysis and synthesis has reached a goal? Professor Stuart answers: "The formal test of the rightness of an act must be for the agent his own consciously grounded conviction of its *finality*." But this finality is not the mere *de facto* finality of deciding to do or leave off doing. It refers rather to the *method* of decision. It means that the process of deliberation has so taken account of all the known relevant factors in any given case that it can have at the end the *logical* attribute of finality for *that* situation. Whether or not one finds Professor Stuart's account of the criterion adequate, the important thing is his contention that the construction of the moral ideal is a part of the moral act, not given outside and prior to it; and that self-realization is just the entire act of constructing and executing a purpose rather than a process of analyzing and imitating an archetype set from and to all eternity.

'Utility and the Accepted Type' is the title of Professor De Laguna's paper, in which he discusses the relation between two apparent standards of conduct, (1) 'a more or less definite type of conduct to which the quality of rightness or wrongness belongs and the appropriate ethical feelings are attached, as honesty, courage, chastity, etc. ;

(2) the other, the probable utility of the act to the agent and society.' After an interesting comparison of æsthetic and ethical judgments, Professor De Laguna finds that these two standards are really not distinct and opposed standards at all, but are rather the relatively permanent, the conventional, the conservative and the reconstructive, the individual, the radical factors, present in all moral experience. "Utility and conformity are then alike essential elements in moral life. Whether in any particular moral judgment either is ever active to the entire exclusion of the other is a question which need not detain us." I see no harm in admitting that the type may act alone. Some readers, however, are likely to find, in view of the preceding discussion, that there is harm in such an admission. The following anti-absolutist passage is worth noting: "The relatively permanent content of the type may pretend to an eternal self-reference until scientific induction shows its genetic dependence upon experienced utility; but the shifting border lines have their distinct external reference. Thus it is found that no moral law, categorical as it may commonly seem, is capable of a valid universal statement, unless indeed the reference to utility be itself formulated as a law" (p. 223).

Those who have encountered pedagogical difficulties in teaching syllogistic logic will find Dr. Dunlap's paper on 'A Theory of the Syllogism' suggestive. Dr. Dunlap attempts to deal with the old subsumptive difficulties, and offers a classification of propositions and a system of symbols which he thinks is able to take care of all possible relationships. Just how far Dr. Dunlap has succeeded could scarcely be expected to appear in a paper which aims to present only an outline with a few illustrations. It is at any rate an interesting attempt at a much-needed reconstruction of the syllogism.

The last paper, by Dr. Overstreet, on the 'Basal Principle of Truth Evaluation' seeks to escape the implicit skepticism of absolutism by an attempt to make out a case for 'a perfectly adequate grasp of a partial truth.' For this adequacy there appear to be two criteria: 'inconceivability of the opposite,' and 'self-maintenance'—the relation between which is not altogether clear. To the reviewer the crux of the paper lies in the attempt to escape the absolutist's difficulty while still holding to the latter's conception of the general nature of truth and reality. Thus the author's conception of completeness is the absolute completeness of a fixed and closed system, instead of completeness as determined by specific purposes, which to the reviewer appears to be the only way of escape from the absolutist's dilemma.

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EMOTION.

Le Mécanisme des Émotions. DR. PAUL SOLLIER. Paris, Alcan, 1905. Pp. 303.

The theory developed in the five chapters of this volume is succinctly stated in the following definition: Emotion is 'the diffusion of energy transformed and liberated by the brain in the brain itself and the absorption of this energy by the brain at the expense of the effective work for which it was destined' (p. 48). To be more precise, this diffusion takes place in the cerebral cortex, with which alone the author connects phenomena of consciousness. For emotion is also a phenomenon of consciousness, not merely the diffusion of cerebral energy (p. 115). Strictly it is to be considered not even as consciousness of the diffuse molecular changes of the cerebral cortex — still less of the peripheral changes — but as consciousness of the molecular state of the cerebral cortex brought about by the diffusion of a stimulus in the brain, whether transitory or permanent and whether accompanied or not by surplus of activity or by inhibition (p. 234). The essential phenomenon, however, is wholly physical, the feeling is a result of the consciousness of the disturbance which it accompanies and completes (p. 243). The physical basis of emotion is the emotivity or excitability of the cortex, that is, the facility, original or acquired, with which the brain responds to stimuli by a diffuse expenditure of its energy. This property is identical at bottom with sensibility and irritability (pp. 110, 117), and, indeed, with the susceptibility to general disturbance possessed by every machine (pp. 10, 20, 46). Hence 'the mechanism of emotion': the emotional process is, in the strict sense, mechanical.

The theory thus outlined consists of three main parts: (1) The emotional process is mechanical, physical; (2) it is a process of diffuse, incoördinated nervous discharge; (3) it is a central, cerebral, not a peripheral process.

On the first of these points the author, while admitting the uniqueness of the machinery and energy of the brain, nevertheless insists that the cerebral mechanism not only obeys the general laws of dynamics and physics, but differs in no essential respect from physical mechanisms; between its functioning and theirs there is not only analogy, but identity (p. 40). It is a little difficult to reconcile this broad assertion of identity with the previous recognition of difference. Are we actually to suppose that the postulate, the operations of nature are everywhere conformable to law and, indeed, to [mechanical law, is the same thing with the postulate that mechanical laws are the only

laws there are? However, the general question as to how far the functions of the brain can satisfactorily be expressed in terms of dynamics or physics need not detain us. What interests us here is the application of the conception to the explanation of the emotions. After commending Sergi as perhaps the only writer who has attempted to treat the emotions from the general mechanical and dynamical point of view — Sergi cites the laws of inertia, reaction, periodicity, antagonism and cohesion, which he applies, however, directly to the mind instead of to the brain — Sollier gives his own explanation, from the same point of view, of a variety of phenomena of general significance in the emotional process (Chap. II., 'Evolution of Emotion') His conclusions are such as these: In surprise the only operative cause is the mechanical law of action and reaction (p. 57); in contrariety — the feeling of being crossed — the problem is simply one of the equilibrium of forces (p. 64); the failure of an emotion to appear at the time it would naturally be expected, while it appears later (*retard des émotions*), is due to inertia (pp. 70 ff.); the substitution and balancing of emotions are phenomena of the equivalence of forces; their oscillation, of periodicity (p. 79). Now it is not necessary to deny the presence of these mechanical factors to question their adequacy. The simplification is, indeed, complete. But in arriving at these results, have not other factors been overlooked without which the processes indicated would fail to issue in an emotional experience at all? Where, for example, would be the feelings of surprise and contrariety without the thwarting or arrest or other modification of or reference to the interests and complex conative tendencies of a sentient subject?

Conative tendencies, subjective interests, these, if recognized by Sollier as having anything to do with the process of emotion, would, of course, have to be considered in terms of their physiological, and in his view their mechanical, equivalents. But he does not thus specifically consider them. On the other hand, he has a good deal to say of the general relations of mental, and in particular of emotional, phenomena to the functional states of the brain. His account of this relation, however, seems neither clear nor consistent. His view claims to be monistic or unitary. But this may be variously interpreted: and, in fact, various interpretations are here offered us in unmediated juxtaposition. In one place, for example, we have the double aspect theory of a variety of parallelism, and it is regarded as the greatest reproach to seek to subordinate either aspect to the other (p. 34). But then we are elsewhere told that the psychical function is merely a physiological function, and that reducible, in the last analysis, to

general physico-chemical laws (p. 79); and in the same context, as though meaning the same thing, psychological phenomena are declared to be the result of physiological functions. Clearly in either case the psychological is subordinated. Indeed, in one passage, this subordination is expressly asserted (p. 109). The assertion, however, is immediately retracted, and the belief expressed that there is not really subordination, but concomitance (as though the two were logically opposed!) and an intimate association of the diverse manifestations, so that one of them is capable of recalling the others. This suggests a possibly new interpretation, namely that the psychical and physical factors are to be conceived as an organized association of differently appearing energies. There are perhaps traces of this 'energetic' conception. It would be consistent, for example, with such a conception to speak, as Sollier does, of the determination of emotion by perceptions and ideas (p. 286) and of the modification even of the emotivity by reasons (p. 105)—language which, as ordinarily used, implies interaction. But this view is not carried out. The psychical appears rather as a function or product of the physical, or as itself a physiological function, or, again, as an accompaniment of such function. The cerebral state *produces* the representation (p. 110). Emotion is purely cerebral (p. 111). The feeling of the emotion is (p. 115), or results from (p. 243), the consciousness accompanying the cerebral modifications.

These ambiguities are further complicated by the obscure indications the author gives of what may be called the 'seat' of consciousness. Emotion, we are told, has no special center; it is the feeling of the diffusion of energy across the brain in all directions (p. 218). But is this denial meant to hold of the feeling as a state of consciousness, of emotion in the proper psychological sense? This is doubtful. A distinction is drawn between the 'organic' brain in which the fibers of projection terminate and the 'psychic' brain, identified with the prefrontal lobe, connected with the rest of the brain by fibers of association. The former is said to contain the centers of perception and representation, the latter the center of apperception and memory (p. 7). Now this seems to assert a distribution among the brain centers of psychical functions and to suggest that the appropriate modifications of the centers in the 'organic' brain are directly concomitant with conscious sensations, perceptions and ideas. Sollier speaks, indeed, of perceptions and representations as being *in* the cortical centers (p. 286). But on looking closer we find that the properly psychical functions are ascribed exclusively to the 'psychic' brain (p. 7),

and that the author regards this, 'with Bianchi, Wundt, etc.,' as the center of consciousness (p. 222). And in accordance with this sensation even is represented as a consequence of irradiation from the other centers in the center of apperception concomitant with the movement similarly conditioned at the periphery (p. 8). It would seem, therefore, that the 'perceptions' and 'representations' in the 'organic' brain centers are unconscious, indeed not properly mental facts at all, and that the physiological processes directly correlated with conscious experience are in all cases centered in the prefrontal lobe. But this conclusion is in turn made doubtful by the explanation given of certain pathological cases of emotion. It is suggested, namely, that in these cases the center of apperception may be inhibited and only the organic brain be active. In this condition, it is supposed, emotions are produced only on occasion of actual experiences, where no mental representation is required, though the patients may still preserve a form of pure abstract memory (p. 144). It is unnecessary to observe that representation has been previously assigned to the same centers as the sensations and that memory has been referred to the center of apperception. All that we need here note is that with the center of apperception assumed to be inhibited, with the 'organic' brain alone active, the patients in question are certainly not unconscious. Thus this whole doctrine of the relation of mind and brain rests in haze. Is not this confusion largely the result of the author's inveterately indiscriminate use of terms which properly designate actual facts of experience to denote also the hypothetical, objective, physical facts with which they are at best concomitant, but by no means identical?

The second main part of Sollier's theory of emotion was that emotion *is*, or is the feeling of, the diffusion and absorption by the brain of energy destined for effective work. It is not merely that the energy diffuses itself through numerous paths, it must diffuse itself through paths which it ought not to follow (p. 19). Not that there is always, as Paulhan holds, arrest of tendencies; tendencies may be greatly facilitated. Emotions may be dynamogenic as well as inhibitory; they may also become systematized and fixed (pp. 101 ff). But in any event the discharge involves a general perturbation of the normal and effective working of the cerebral machinery. There is an absorption of energy destined for practical use. The discharge is by illegitimate paths.

This theory is so plausible, it comports so well with so many obvious facts, that it may seem hazardous to question its adequacy as a general theory covering all cases. One may be permitted, however, to do this in the interest of clearness. The theory asserts two things,

first, that the emotional discharge is widely, or generally, distributed; secondly, that the distribution of the energy is at the cost of effective work. Both assertions, probably, are meant to be included under the term 'diffuse.' The first of these assertions need not here be disputed; the second, however, must not pass unchallenged. For, taken literally, it implies that emotion is a factor in human experience which always imparts a failure in practical efficiency. And this is not believable. It is not believable that the emotional life of man has no other significance than as the break-down of practically efficient coördinations. It is not true to experience that that man is most efficient, in the broad, human sense, whose inner life is cold, calm, passionless and flat. Rather the wide survey of human nature which led Hume to declare, with some exaggeration, that reason is and ought only to be the slave of the passions, suggests a different conclusion. It is, of course, possible to limit the conception of emotion by verbal definition so as to include under the term only those cases which meet the conditions of the theory. But the limitation would be of doubtful utility, and Sollier, at least, does not make it. He seems rather to have been misled by a narrowly mechanical conception of the organism. The brain is a machine. Its 'emotivity' is merely the susceptibility of any machine to general disturbance. If the machine is well made, it eventually recovers from the disturbance and resumes its normal functions; otherwise its efficiency is, to a greater or less degree, impaired. It is even so with the brain (p. 47). Up to a certain point, no doubt, the analogy holds good. The point where it breaks down is where the brain is regarded as the organ, or instrument, of a mental development. It has no merely fixed, mechanical function to perform like other machines; its functions are ever variable, and its measure of efficiency is not the amount of mechanical work it does, but its success in organizing and directing the significant activities of a conscious, developing individual. How far emotion is concerned in this development can only be discovered by a broad contemplation of the facts of human life, and theory must be adapted to the facts, not facts forced to fit the theory. And it does seem as though emotion at large played a more efficient rôle in human development than the theory under consideration allows for. Why is it, for example, that while in terror and anguish coördination of serviceably disposable energy is broken down, in moods of elation, in the glow of sustained enthusiasm, in certain phases and forms of love, we seem to have the most favorable conditions for its organization and employment?

The third part or moment of Sollier's theory is that the emotional

process is purely cerebral. This thesis is directed against the James-Lange, here called the peripheral, theory. This latter theory is under criticism throughout the entire work and especially in Chaps. III. and IV., which treat respectively of emotion and sensibility, the more negative part, and of emotion and cerebral cœnæsthesia, the more constructive. The fullness and vigor of the attack and the pains taken to establish the opposite theory are of the nature of a recantation. For in 1894 Sollier was of a different opinion and published a famous article in which the peripheral theory was held to be supported by experimental evidence — which almost realized James's idea of a crucial test — of the loss of emotion consequent on induced (suggested) general peripheral and especially visceral anæsthesia ('*Recherches sur les rapports de la sensibilité et de l'émotion*,' *Rev. Phil.*, March, 1894). But this was before he had developed his cerebral theory of hysteria. He then, he tells us, regarded the hysterical anæsthesias 'as was done at that time' (by whom? surely not by James), as purely psychological, as phenomena in which the brain was in no way interested, and believed that 'the brain remained in its normal state of functioning' (p. 159). With these assumptions the conclusions drawn were, he thinks, justified. But the case is altered when it is seen, as he now holds, that the peripheral anæsthesias are only the translation and expression of the cerebral. Now we must conclude, not as formerly, that emotion is absolutely dependent on visceral sensibility and is localized in the points of the organism where the visceral sensibility is preserved, but that 'emotion is constituted almost exclusively by the conscious sensation of the phenomena arising in the brain in the regions governing the viscera and the vaso-motor functions' (p. 191); in brief, that emotion is a phenomena of cerebral cœnæsthesia (p. 234). For the brain itself is sensitive, like any other organ, and — probably through the center of apperception — conscious of its sensitivity (Ch. IV.). The question of the order — perception, emotion, expression or perception, expression, emotion — is met by the assertion that the emotion and the expression are concomitant. The emotion, it is declared, has only two elements, an exciting perception, or idea, and phenomena of expression, at once physical and psychical, namely, phenomena of the cerebral perturbation produced by the excitation (p. 262).

The criticism of the 'peripheral' theories seems to be based in part on a misunderstanding. It seems to be assumed that they share the author's original peculiar 'spiritualistic-dualistic' prepossession and that they treat the peripheral and the cerebral modifications as en-

tirely independent phenomena. Thus they are said to be, while apparently physiological, essentially psychological, 'since they make the emotion the simple feeling of the peripheral variations' (p. 14). And Lange is criticised (p. 227) for making the circulatory changes due to the taking of wine or hashish independent of the action of those substances on the brain, as though a change of view in this respect would make a vital difference in the theory. It hardly needs to be remarked that the common assumption underlying James's theory of emotion equally with Sollier's own is, that the feeling called emotion is directly correlated, like every other content of consciousness, with a special modification of the cerebral cortex. In one sense, therefore, the opposition of 'a cerebral' to a 'peripheral' theory is misleading. Both theories are ultimately cerebral. The question is, with what modifications of the cerebral cortex is the emotional experience correlated? And, again, how are these modifications brought about? And there is the further, psychological, question, in what does the feeling of emotion consist? James's answers are well known.

Sollier's most effective criticisms of these answers are found in the evidence he alleges of the absence of any necessary connection between the specific character and the intensity and extent of the peripheral changes and the character and intensity of the emotions. The personal reaction in emotion, he says, is often always the same with a given individual, whatever may be the nature and origin of his emotion (p. 28). He admits that, among normal persons, like emotions generally express themselves in like, that is, analogous, but not identical, ways; but he has known persons, he says, all of whose emotions were expressed in the first instance by intestinal, cardiac, secretory or circulatory disturbances on which other manifestations were grafted, and he refers to a patient of Charcot's whose excited feelings found vent in laughter under all circumstances, even the most incongruous. He cites the experiments of Sherrington, which, though not conclusive because the whole of the sympathetic system was left intact, nevertheless showed that the suppression of a part of the peripheral conditions by no means involved a corresponding diminution of the emotivity. But the cases of cancer of the vertebral column in which the sympathicus is involved, though not all the fibers are destroyed, show no proportional diminution of the emotivity. Finally in the decerebrated animals of Bechterew and Soury, all the corporeal phenomena were produced reflexly. Thus the emotional sentiment persists when the brain is intact, although the corporeal phenomena are suppressed, but disappears, notwithstanding the pro-

duction of the bodily reactions, when the brain is destroyed (p. 122). This last point, however, is obviously, if James's theory is also cerebral, more specious than convincing. And on the same hypothesis there is but little force, and apparently no little misconception, in the assertion (p. 292), that the 'peripheral' theory is refuted and the 'cerebral' theory confirmed by the fact that sensations are experienced in an amputated limb.

What, then, according to Sollier, is the relation of emotion and its expression? Discussing his experiments on hysterical subjects and arguing on the hypothetical case of the peripheral reactions appearing without the emotion, he suggests the reasonable explanation that, as in the case of the decerebrated animals referred to above, the subcortical apparatus is intact, but that the brain is not in a condition to perceive the reflexly excited reactions. He admits that this result might be interpreted in favor of the peripheral theory. But, he adds, it can be maintained equally well that 'if the peripheral modifications do not of themselves determine the emotion, the emotion is due solely to changes occurring in the cerebral cortex itself, and that the emotional peripheral modifications arise by independent ways and complete the emotion, but cannot constitute it' (p. 161). This is perhaps possible, though it is certainly not clear how an emotion can be 'constituted' without being 'complete.' But it seems to be meant that the essential part at least of the emotional process is, or may be, entirely independent of any modification, direct or indirect, that may be made in the brain by the experience of the somatic reaction. Is this, in the case at any rate of the 'coarser' emotions, probable? Sollier himself, indeed, speaks of fear as 'constituted' by the trembling, palpitations, troubled breathing and movement of flight that may follow, on occasion, a shock of surprise (p. 51). Again, we are told that there are cases in which the greatest emotion is excited with almost complete absence of motor, secretory and vaso-motor phenomena (p. 19). Elsewhere (p. 187) emotion is said to be almost entirely constituted by the excitability of the brain in regions governing the viscera and the vaso-motivity; and, in general, the rôle of the centers of movements and of common cutaneous and muscular sensibility is held to be strictly subordinate. But how are we to know apart from the bodily manifestations what centers are affected? We are thrown back on the general theory. 'I entirely agree with W. James,' says Dr. Sollier, 'in recognizing that the sensation of the manifestations plays an important part in the genesis of emotion,' but he adds that the evidence shows 'that this sensation arises not at the periphery, but in the centers

of representation of the cerebral cortex themselves, and that the peripheral sensations are only secondary, since the cortical representation suffices to produce the emotion' (p. 279). There is then, it would seem, a double sensory process, the process connected with the excitement in the cerebral centers, what Sollier calls the cerebral cœnæsthesia, which alone constitutes the emotion, and the process connected with the bodily excitement, regarded as its 'projection' or 'translation' but relatively to emotion wholly secondary. It is not easy to grasp the relation of these two processes, or of this double process, physiologically, or to understand how two things that manifest themselves, according to the theory, in two such separate ways as cerebral cœnæsthesia and bodily sensations can be both alike treated as the manifestation of emotion, as respectively original and translation of the same fact. But in one respect, at least, the new theory marks an advance: it recognizes distinctly that emotion is not the consciousness of bodily sensations. It is, however, no more the consciousness of cerebral excitement; it is not cerebral cœnæsthesia. The appeal here must be to experience. That it is a consciousness connected with cerebral modifications of some sort few probably at the present day will dispute. But these modifications must be of a sort to correspond with the unique synthesis, the unique attitude, which emotion as a distinct form of affective experience involves. That the modifications due either to present or to past bodily changes in no wise enter into this synthesis is hard to believe; but how far the process is centripetal, how far centrifugal—the sentiment of personality, intimately connected with emotion, is, for Sollier, a centrifugal phenomenon (p. 150),—how far central, and how the synthesis, or synergy, is built up, is still a problem. We need some new organizing conception; purely mechanical principles seem to take us but a very little way after all.

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MEMORY.

The Place of Mental Imagery and Memory among Mental Functions. FRED KUHLMANN. *Amer. J. of Psych.*, 1905, XVI., 337-356.

"The ability to learn has been made a criterion for the existence of consciousness." This implies that conscious use is made of past experience. But conscious memory, or mental imagery, is not necessary for some types of learning, *e. g.*, adaptation in digestive processes at birth, or racial adaptation to environment. Loeb and Lloyd Morgan regard the mental image as the essential factor for the possi-

bility of learning, Bentley and Thorndike do not. Where the memory image does not exist 'consciousness must move within the narrow limits of the present.' But where it is present its utilitarian significance lies especially in its 'forward look,' in 'foreseeing and providing for the future.' The article is a good critical résumé but adds nothing new.

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BOOKS RECEIVED FROM DECEMBER 5, 1905, TO JANUARY 5, 1906.

General Sociology. ALBION W. SMALL. Chicago, University of Chicago Press; London, T. Fisher Unwin, 1905. Pp. xiii + 739. \$4 net.

The Dissociation of a Personality. MORTON PRINCE. London, New York and Bombay, Longmans, Green & Co., 1905. Pp. x + 569.

La théorie physique, son objet et sa structure. P. DUHEM. Paris, Chevalier & Rivière, 1906. Pp. 450.

La matière, sa naissance, sa vie, sa fin. P. DE HEEN. Brussels, Hayez, 1905. Pp. 119.

National Educational Association; Journal of Proceedings and Addresses of the Forty-fourth Annual Meeting held at Asbury Park and Ocean Grove, New Jersey, July 3-7, 1905. Winona (Minn.), Publ. by the Association, 1905. Pp. 968. (Also, separate: *Yearbook and List of Active Members, 1905-6*; pp. 251. *Report of the Committee on Taxation as Related to Public Education*; pp. 87, 10 c. *Report of the Committee on Industrial Education in Schools for Rural Communities*; pp. 97, 10 c. *Report of the Committee on Salaries, Tenure, and Pensions of Public School Teachers in the United States*; pp. 466, 50 c.)

NOTES AND NEWS.

THE second annual meeting of the Southern Society for Philosophy and Psychology, announced for January 2, 1906, in affiliation with the A. A. A. S., has been indefinitely postponed, owing to the inability of the members to be present in New Orleans at that time. It is hoped that arrangements may be made for a meeting at a later time and at a place more convenient for the members.

AT the University of Toronto the following additions have been made to the staff of the psychological laboratory on account of the

increase of graduates and undergraduates in the department: W. G. Smith, B.A., formerly assistant in the laboratory, is made lecturer in philosophy also; T. R. Robinson, B.A., lecturer in philosophy; Margaret K. Strong, B.A., F. L. Barber, M.A., and D. Dix, M.A., class assistants in psychology.

THE chair of philosophy at Lafayette College, to which James M. Mecklin, Ph.D. (Leipzig), was called last year, has been endowed through the liberality of a friend of the college. Psychology is included in its scope.

PROFESSOR ROYCE's lectures on Idealism at the Johns Hopkins University are to be given during the second half of January. They will be followed in February by a special course of lectures on Educational Psychology, also public, by Professor Baldwin.

THE sixth International Congress of Criminal Anthropology will meet at Turin, April 28, 1906. Professor C. Lombroso is president of the committee of organization. All who expect to attend are requested to send their names at once to the secretary, Professor Mario Carrara, 26 Via Michelangelo, Turin.

PROFESSOR J. MARK BALDWIN has been commissioned by the Mexican government to examine the university situation in that country. He started December 23 for a three weeks' tour of inspection.

THE annual meetings of the American Psychological and Philosophical Associations at Cambridge were well attended. Reports of the proceedings will appear in the February number of the *BULLETIN*. Professor James R. Angell, of the University of Chicago, was elected president of the former association, and Professor William James, of Harvard University, president of the latter, for the coming year.

PROFESSOR E. HERSHEY SNEATH, of Yale University, has been obliged to take a year's leave of absence on account of his health. He will return to his work in the department of theory and practice of education in September, 1906.

ASSISTANT PROFESSOR C. H. JUDD has been made director of the Yale Summer School.

THE following are taken from the press:

PROFESSOR WILHELM OSTWALD, of Leipzig, has been appointed non-resident lecturer in psychology at Columbia University for the current year. He will give a series of lectures, beginning January 26, on 'The Relation of Energy to Life and Thought.'

DR. RICHARD HODGSON, secretary of the American Society for Psychical Research, died suddenly at Boston on December 20.

PROFESSOR WILHELM WUNDT, of the University of Leipzig, celebrated on November 10 the fiftieth anniversary of his doctorate.

THE
PSYCHOLOGICAL BULLETIN

PROCEEDINGS OF THE FOURTEENTH ANNUAL MEETING OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION, CAMBRIDGE, MASS., DECEMBER 27, 28 AND 29, 1905.

REPORT OF THE SECRETARY.

The fourteenth annual meeting of the American Psychological Association was held at Harvard University, Cambridge, Mass., on Wednesday, Thursday and Friday, December 27, 28 and 29, 1905, in affiliation with the American Philosophical Association. About one hundred members of the two associations, including sixty-five belonging to the Psychological Association, were in attendance at the various sessions, some of which also attracted a large number of outsiders. Most of the members were accommodated in dormitory rooms, thanks to the courtesy of Harvard and Radcliffe students.

All the sessions were held in Emerson Hall, the new building devoted to philosophy, psychology, and sociology. To signalize the formal opening of this building, special exercises were held on the afternoon of Wednesday, December 27, Professor Münsterberg presiding. Addresses were made by President Eliot and Dr. Edward Waldo Emerson. These exercises were immediately followed by a joint discussion with the American Philosophical Association on 'The Affiliation of Psychology with Philosophy and with the Natural Sciences,' with Professor Dewey, President of the Philosophical Association, in the chair. President Calkins was in the chair at all the other sessions of the Association. On Thursday afternoon, immediately following the business meeting, the Association went into conference on the subjects of 'Coöperation between Laboratories and Departments of Different Institutions' and 'Elementary Instruction in Psychology.' Papers were grouped and distributed among the other sessions, so far as possible, with a view to unifying their several programs. On Wednesday morning most of the papers were on

comparative and abnormal psychology. Thursday morning was given up to a set discussion on the 'The Definition of Feeling,' followed by other papers on general psychology. At twelve o'clock Professor Wilhelm Ostwald addressed the Association, by invitation, on 'Psychical Energy.' The sessions of Friday were devoted to the section of experimental psychology, the papers of the morning dealing with related problems in vision, those of the afternoon being of a miscellaneous character. At the close of the formal program there followed an inspection of the new Harvard Laboratory and the demonstration of apparatus used in current researches.

The members of the Association were hospitably entertained at luncheon by the Harvard Corporation at the Harvard Union on Wednesday at 1 o'clock, and at a reception tendered by Professor and Mrs. Münsterberg at their home immediately after the address of the President on Wednesday evening. Most of the members of the Association heard the presidential address before the Philosophical Association on Thursday evening, after which a joint smoker of the two Associations was held at the Harvard Union. Visits were made to Wellesley College, the McLean Hospital, and the Massachusetts Institute for Feeble Minded, by invitation of these institutions.

At the regular business meeting held on December 28, the following was transacted: Election of officers for 1906: *President*, Professor James Rowland Angell, University of Chicago; *Members of the Council to serve three years*, Professor Mary Whiton Calkins, Wellesley College, and Professor C. E. Seashore, University of Iowa.

The following new members were elected: Dr. Elizabeth Kemper Adams, Smith College; Professor Bird Thomas Baldwin, West Chester Normal School, Pa.; Dr. J. Carleton Bell, Wellesley College; Mr. Edward Herbert Cameron, Yale University; Mr. Donald John Cowling, Yale University; Professor Kate Gordon, Mt. Holyoke College; Professor Edmund B. Huey, Western University of Pennsylvania; Professor Charles Hughes Johnston, State Normal School, East Stroudsburg, Pa.; Dr. Irving King, Pratt Institute; Dr. Adolf Meyer, New York State Pathological Institute; Dr. Naomi Norsworthy, Teacher's College; Mr. James P. Porter, Clark College; Dr. Morton Prince, Tufts College Medical School; Miss Margaret S. Pritchard, Philadelphia Normal School; Dr. James J. Putnam, Harvard Medical School; Dr. Eleanor Harris Rowland, Mt. Holyoke College; Professor Henry A. Ruger, Colorado College; Dr. Boris Sidis, Brookline, Mass.; Dr. Theodate L. Smith, Clark University; Dr. Edward G. Spaulding, Princeton University; Professor Herman

Campbell Stevens, University of Washington; Professor Herbert Stotesbury, Temple College.

The Secretary reported on behalf of the Council that an invitation from the University of Illinois to the installation of President Edmund Janes James on October 17, 18 and 19, 1905, had been accepted, and that by request of the Council Professors Cattell and Jastrow represented the Association.

Upon recommendation of the Council, it was voted to amend Article IV. of the Constitution to read as follows: "Annual subscription. — The annual subscription shall be one dollar in advance." An affirmative vote having been polled at two successive meetings, the Constitution now stands amended as above.

Upon recommendation of the Council, it was voted to accept the invitation of Columbia University to hold the next annual meeting in New York, in affiliation with the American Association for the Advancement of Science and the American Society of Naturalists, with the understanding that the American Philosophical Association decide to meet at the same time and place, power being given to the Council to arrange otherwise in case circumstances should arise to make a change of plan desirable.

The Council presented a report from the Committee on Bibliography, which appears below, and recommended that the Committee be discharged with the thanks of the Association for its services and that no action be taken until after the appearance of Dr. Rand's bibliography. On motion, this recommendation was amended to the effect that the Council be instructed to recommend action after an examination of Dr. Rand's bibliography, and was adopted as amended.

Upon recommendation of the Council, it was voted to instruct the new Council to consider the whole question of the guardianship and utilization of the Association's accumulated fund and to report upon the same at the next annual meeting.

Upon motion of Professor Thorndike, it was voted that the Council be authorized, at its discretion, to allow the Secretary traveling and other expenses incident to the arrangement of the program and the preparations for the meetings.

A vote of thanks was extended to the authorities of Harvard University and especially to the members of the Department of Philosophy for the courtesy and generous hospitality shown to the Association.

REPORT OF THE COMMITTEE ON BIBLIOGRAPHY.

To the American Psychological Association:

Your Bibliographical Committee would respectfully report that on the general questions committed to them they have nothing to add to what was contained in their report to the St. Louis meeting, 1903, a copy of which is appended.¹

On the question of expense, with regard to which the Association requested further information at its Philadelphia meeting last year, the committee would report as follows:

The committee knows of no way of determining the expense exactly in advance of the actual preparation of the bibliography. From the best data in their possession they estimate the expense as follows:

Purchase of suitable portions of Prof. Leuba's bibliography	\$ 150.00
Clerical work and cards for the 6,000 or 7,000 titles necessary to complete the bibliography, estimated to include a total of about 12,000-15,000 titles	150.00
Salary of the executive agent recommended in the St. Louis report.....	1,000.00
Printing and publishing an edition of 500 copies in the style of the 'Psychological Index' ²	1,020.00—1275
Total.....	\$2,320.00—2575

Respectfully submitted,

The Committee on Bibliography,

By E. C. SANFORD, *Chairman*.

REPORT OF THE TREASURER FOR 1905.

DR.

To receipts from retiring Treasurer.....	\$2,667.21
Dues from members.....	216.30
Total	\$2,883.51

¹This report to the St. Louis meeting, 1903, was published in full in the Proceedings of that meeting (this BULLETIN, February 10, 1904), and is not here reproduced.

²This estimate is given at the request of the Association; the committee in an earlier report advised against immediate printing of the bibliography. *Vide* Report of 1902.

CR.

By expenditures for printing (including printed stationery).....	\$ 50.80
Postage and special stationery	20.45
Clerical assistance.....	38.64
Proceedings.....	6.64
Smoker at Philadelphia, 1904.....	30.90
Total	147.43
	2,736.08
Accumulated interests on deposits, July 1, 1905.....	32.74
Total	\$2,768.82
Audited by the Council.	

WM. HARPER DAVIS,
Secretary and Treasurer.

ABSTRACTS OF PAPERS.

A Reconciliation of Structural and Functional Psychology. President's Address. By MARY WHITON CALKINS.

Psychology is the study of the conscious self. Not the psychic event—the mental process or idea—is the basal fact of psychology but the self from which every psychic event is a mere abstraction. This self of the psychologist must be sharply distinguished, first, from the philosopher's self, the object of metaphysical study; second, from the biologist's self, the animal body which 'has consciousness,' and, finally, from the sociologist's self, the self regarded as a member of a community.

The scientific study of the conscious self involves two essential procedures: First, the analysis of its consciousness into structural elements, sensational, affective and the like, and, second, the enumeration and classification of its relations with its environment, that is, with other selves and with objects. The first of these procedures is the distinctive feature of structural psychology; the second is the fundamental motive of functional psychology. The essentials both of structural and of functional psychology are thus combined in psychology as study of a self; for this self is both a complex of elemental experiences and a complex of relationships to its environment. (To appear in full in the *PSYCHOLOGICAL REVIEW* for March.)

The Relations of Muscular Activity to the Mental Process. By GEORGE V. N. DEARBORN.

While denying the hereditary, *ex cathedra* supposition that the brain is the sole correlate of the mind, the present notes suggest only

some of the claims of muscular protoplasm for consideration as representing a part of the mental process. The burden of proof rests upon those who limit the physical basis of consciousness to the nervous system, for unless consciousness is of the nature of a secretion such a view is unwarranted.

The *a priori* criteria of correlation are not very clear. But, if intricacy of structure, subtlety of metabolism, or variety of forms of energy be the criterion, form of protoplasm excels muscle as a correlate. A criterion perhaps more likely is motion, one of the basal characters of life in both its psychic and somatic aspects. It is certain that muscle represents inherent molar movements better than any other tissue and molecular motion at least as well as any. Recent physiological research shows that muscle tonus (a partial balancing of varying contractions) pervades all muscle always. From the other side psychology in its theory of feeling demonstrates both the universality of muscular activity and the probable continuity of affective tone.

Muscles are not separate organs for the most part, but probably a nearly continuous vitally active tissue pervading practically the whole body and forming half its mass. There are more than six hundred 'voluntary' muscles, and muscle of a reflex sort is all over the rest of the body save in the bones, the nervous system, and the alveoli of glands. 'Voluntary' muscles serve relatively new combinations of movement, while the 'reflex' muscles assist the vegetative movements. Both alike, however, are served by myriads of afferent and efferent neural end-organs and thus share alike in the highly complex 'motor' mechanism of the organism, correlate of the fusion-current of consciousness. But these varied end-organs serve the autonomous muscle-protoplasm; for the balance of recent evidence, histologic and physiologic, goes to prove both the unity and the autonomy of muscle tissue.

All these properties of muscle combine to help supply the criteria of psycho-physical correlation lacking in the cerebral cortex and also simplify the theory of bodily movement.

How can the Relation of the Conscious to the Subconscious be Best Conceived? By IRVING KING.

This paper criticises the common mode of conceiving consciousness after the analogy of the visual field. As against this view it is here suggested that consciousness be conceived as a point, correlated not with neural activity, *per se*, but with a certain organization of neural processes. The *point* of consciousness is modified by outlying neural processes as well as those most directly concerned in the adjustment in progress. This 'point' is also self-consciousness.

From the standpoint here proposed the subconscious is not dim consciousness, but outlying neural processes and dispositions which in a vague way affect the movement of the central organization of neural processes with which the *point* of consciousness is correlated. (This paper appeared in full in the PSYCHOLOGICAL REVIEW, for January, 1906, under the title, 'The Problem of the Subconscious.')

The Senses and Intelligence of the Japanese Dancing Mouse, with Demonstrations. By ROBERT M. YERKES.

Further Study of the English Sparrow and other Birds. By J. P. PORTER.

A vesper sparrow, a cow-bird, four English sparrows, and two pigeons have been made the subjects of experimentation. All except the pigeons, which were not tried with this apparatus, learn a simple maze in from twenty to thirty trials. Ten memory tests thirty days later with no intervening tests show a surprising good memory. A reversal of the maze gives rise to much interference during the first tests, but this is quickly overcome. In all these tests the vesper sparrow shows least ability to profit by experience. The English sparrows are little, if at all, superior to the cow-bird.

The results with a food-box opened by pulling or pushing any one of four strings just to the left of the door indicate that the cow-bird, a male dovescot pigeon and a female passenger pigeon learn in much the same way, if not quite so rapidly, as the English sparrows. There are more failures later in the series, especially for the male pigeon. Memory tests thirty days later give much the same results as before, a second memory series one hundred and twenty days later for the cow-bird and one hundred and forty days for the male pigeon indicate that much more is forgotten than during the shorter interval. The lapse of time leads to a reversion to an earlier method of opening the door.

The cow-bird learns to distinguish between the designs and colors used with the English sparrow in an earlier study (reported at the St. Louis Meeting of the Association and published in *Am. Jour. Psych.*, July, 1904). With the more difficult designs the sparrow is better. With the colors there is little difference. Some tests with forms indicate that the cow-bird was learning the triangular-shaped box. My earlier results with the English sparrow were negative.

The English sparrow when observed in confinement with the above named birds or out-of-doors has shown itself more capable of fear, courage or boldness, caution and independent action. It is more of a leader, more persistent, and more active. The cow-bird at times is

as wary but not so bold. The pigeons are very timid, have a keen sense of vision, and seem easily distracted. The vesper sparrow has less fear, and seems much more trustful than her nearer relative.

The Habits and Instincts of Spiders, Genera Argiope and Epeira.

By J. P. PORTER.

The spiders, *Epeira trifolium*, *sclopetaria*, *strix*, *patagiata*, *corticaria*, and *angulata*, and *Argiope transversa* and *riparia* have been studied. Most of these have been observed both in and out of doors.

All have shown great differences in degree of development and some in color markings, especially *E. trifolium*. There are great variations in the selection of a place for the web and, in the case of those that build one, of the nest; also in the material for a nest. Observation of the laying of foundation lines for the web shows that with *A. transversa* and *E. trifolium* it is a 'trial and error' affair. In the actual making of the web there is much variation due in part to the site chosen. Any part may be made stronger if need be. Webs may vary from the normal slant, there may be more spirals above than below the center, which is equivalent to turning the web upside down, very often the 'winding stair' may be partly or wholly omitted, the center of the web left undarned, the side-guards or screens, one or both, left off. Counts of elements of five different parts of the web (the supports, radii, outer spirals above, and below, and the inner spirals) covering many individual webs all give a very large 'mean variation' and 'probable error.' Since the young spin such perfect webs, very often more perfect than those of the old, it would seem best to look upon these variations as lying within the possibilities of instinct. However, further observations covering the complete life cycle of the same individuals are very desirable. The 'coefficient of variability' is very large even for webs spun in places of the spiders' own choice. Some of these variations are perhaps marked enough to constitute the starting points of new habits and thus possibly of new species.

The first appearance of light in the morning seems to be the stimulus which sets *A. riparia* and *transversa* and *E. trifolium* to spinning. Nightfall is the time for old *E. sclopetaria* and *angulata*. The young of these spin at almost any time of day.

The feeding habits show adaptation to kind of prey. There is some evidence of intelligent adaptation to what is not good for food.

The so-called 'feigning instinct' is not a 'kataplectic' state and seems to be controlled. The instinct to vibrate the web is strongest in

the *Argiope*. They give a rhythmic swing to the web when disturbed. This led to a test of their range of attentive vision, which is very probably ten to twelve times greater immediately after they have been disturbed than when at rest.

Spiders behave in a manner which in higher animals would be credited to fear, anger, courage, attachment to web, nest, cocoon or young. Their sexual feelings are very strong. They seem to be cautious and persevering. The females seem to show powers of expectant attention and voluntary control.

The courtship or the approach of the male to the female is made up of a number of rather definite steps. The male profits by the helplessness of the female during moulting, and copulation occurs then. The process is variable.

There would, therefore, seem to be much in spider habits and instincts to remind us of Loeb's tropisms, yet a sufficiently plastic basis for adaptations, some of which fall within the possibilities of instinct, while others, perhaps, are cases of intelligent control.

Variations in the Nests of a Spider, with a Comment on the Measurement of the Variability of Instinct. By WM. HARPER DAVIS.

A series of 222 nests of another species of spider, which binds grass or sedge blades in a peculiar fashion to form boxes for the protection of its eggs, was exhibited and a preliminary report on the variations and their causes was presented. Marked individual differences, including several anomalous types, appear, which probably represent (apart from accidental variations due to mechanical conditions) both variations in instinct and ingenious 'accommodations' to unusual conditions. Variations in length of the regular 'modal' forms conform closely in their distribution to the normal curve of frequency. In spite of the undoubted presence, in this case, of numerous factors which it is difficult to eliminate, it is thought that an objective measurement of the variability of instincts may be possible.

The Ant-queen as a Psychological Study. By WILLIAM MORTON WHEELER. (This paper will appear in full in an early number of the *Popular Science Monthly*.)

Conscious Experiences and the Somatic Group of Senses. By EDWARD COWLES.

This refers to the physiological reactions of the body whose influences are brought to bear upon conscious experience through the group of senses which may be designated as *somatic*. In Professor San-

ford's address to this Association in 1902 on the relation of psychology and physics he describes the conscious experiences that may be called physical phenomena; these belong chiefly to the senses that mediate the 'life of relation' with the world outside of our own bodies, — the 'physical group of senses.' The method of psychology includes the foregoing and deals with all others that belong to inner experiences. This conception of a relation between conscious experiences and outer physical phenomena implies an organism, with its special 'physical group of senses' in touch with the outer contacts, acting as a medium of transmission between the two. This suggests that this medium may be conceived as forming also a *somatic group of senses* in the paths of communication, which adds to its reports of contacts with the other 'life of relation' a multitude of returns, with all their variations, from its own physical workings; we do not recognize for the most part the sources of these sensations, whether of well-being or ill-being, yet they have a controlling influence upon our minds. Thus three groupings are indicated of the functions of the sensory mechanisms of conscious experience: (1) the physical group of senses of the outer 'life of relation'; (2) the somatic group of senses of the inner life, — our conscious experiences of our own bodies; (3) the central psychical life, which includes both of the other groups besides those belonging distinctly to the mental life.

The interest of this to psychiatry is that comparatively little attention has been given to this inner sensory field; yet here are the conditions and the very material of bodily and mental stimulations and sensations with which the mental work is done. These explaining principles have been almost wholly omitted from the accepted formulæ of the conceptions of modern advanced psychiatry, which has chiefly concerned itself with the motor aspects of mental life and expression. These physiological references are needed to explain many of the symptoms of the psychoses and should have their full value in the formulation of the principles of mental physiology and psychiatry.

The Nature of Hypnotic and Post-hypnotic Hallucinations. By
BORIS SIDIS.

Hypnotic and post-hypnotic hallucinations have been studied more for amusement than for scientific analysis. The validity of the hypnotic hallucination has passed unchallenged, because of the doubtful assumption of the central origin of hallucinations, an assumption current among psychologists and especially among psychiatrists who still pin their faith to 'images and idols' and accept uncritically the introspective account of the insane and demented, as to the nature of their

hallucinations. The central origin of hallucinations is highly doubtful, and the hypnotic hallucination certainly does not support it.

Workers in hypnosis have too readily, eagerly and credulously accepted the suggestions of their subjects. Although the introspective account of hypnotic subjects is more valid and trustworthy than that of the insane or of demented, still it should be taken guardedly and should certainly not be accepted uncritically on its face value. Experiments and observations carried out by the writer on many subjects tend to prove that hypnotic hallucinations are neither of peripheral nor of the alleged 'central' origin, but are essentially *spurious* in their character. The so-called hypnotic or post-hypnotic hallucination is really not experienced by the subject. *The hypnotic or post-hypnotic hallucination is not a hallucination, but a delusion.* (This paper is to appear in full in the forthcoming number of the *Journal of Abnormal Psychology*.)

The Psychology of Sudden Conversion. By MORTON PRINCE.

The psychology of sudden conversion is not always the same. This study was, therefore, limited to a particular type of cases which might be exemplified by the case of Ratisbonne, described by William James in his *Varieties of Religious Experience*. According to James' theory of sudden conversion, there has been going on for some time previous to the crisis, in the ultramarginal or subconscious field of thought, an incubation of motives deposited by the experiences of life. Finally, when these motives have come to maturity, they burst forth, like a flower, into the conscious life of the individual.

Thus far no one has demonstrated, experimentally or otherwise, the previous existence of such subconscious ideas in any specific case. The value of the reader's observation lay in the fact that he had had an opportunity to examine experimentally in hypnosis the antecedent content of consciousness in an instance of sudden ecstasy with change of view and belief. The whole, although not of a religious nature, was in every other way (that is, in principle) identical with religious conversion of the type in question. Indeed, religious ideas played a prominent part in the mental content. The subject had betaken herself to church, thinking that through self-communing and prayer she might find some way out of her difficulties. As she communed with herself, still in a condition of self-despair and hopelessness, suddenly all became changed and she was filled with a great emotion of joyousness and of well-being, etc.; in other words, a condition of ecstasy developed, with a belief in her own miraculous cure and that she had

had a visitation. With this belief, exalted religious feelings became mingled.

For purposes of examination the subject in the case reported was put into two different hypnotic states, both able to give an intelligent account of what had happened and was unknown to the subject. The first hypnotic state was able to give only a partial account of what happened in the church and of the content of the subject's mind. The second hypnotic state was able to give a very full account.

In this case, of which a full account has been reserved for the author's work, *The Dissociation of a Personality*, there was then no incubation or flowering of subconscious ideas, but simply emotions of the moment, which, developing in a trance state and persisting after waking as a state of exaltation, had suggested the beliefs which took possession of her mind. The part played by the subconscious mind consisted in furnishing emotions rather than ideas.

Many of the cases of sudden conversion recorded in literature are of this type in that the crisis consisted of a trance-like or hypnoid condition into which the subject fell. The state of ecstasy followed this trance condition, and probably had the same psychological mechanism. St. Paul's conversion was probably of this type.

General Discussion on the Affiliation of Psychology with Philosophy and with the Natural Sciences. Participants: HUGO MÜNSTERBERG, G. STANLEY HALL, FRANK THILLY, JAMES R. ANGELL, A. E. TAYLOR, and WILHELM OSTWALD.

PROFESSOR MÜNSTERBERG contended for the affiliation of psychology with philosophy, as provided for by Emerson Hall. His remarks will appear in the forthcoming second volume of the *Harvard Psychological Studies*, as part of an essay under the title 'Emerson Hall.'

PRESIDENT HALL. — The speaker took the opposite view from Professor Münsterberg and would withdraw psychology from philosophy and affiliate it with the natural sciences, since, from his point of view, psychology, provisionally defined, is "a description as accurate as may 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 which fully knows them. They must also be so ordered like to like, and organized, that they can all be known with the least trouble. The best plan of organization when possible is evolutionary." Under this definition, psychology is excluded from no field of experience, conscious or unconscious, religious, social, genetic

or individual, that can be studied on the basis of solid empirical data, and hence its closest allies as an inductive science in the future must be biology, physiology and anthropology. The nature of soul no more concerns it than does the ultimate nature of matter and motion concern physics. Such discussions belong to philosophy, the history of which the speaker would insist upon as a part of the training of every experimentalist, but would avoid too prolonged a lingering in the philosophical fields, lest it unfit for dealing with facts. Psychology is yet in its dawn, and its striving should be toward the goal of becoming a true natural history of the soul. (Taken from *Amer. J. of Psychol.*, XVII., 145. The remarks will be published in full in *Science*.)

PROFESSOR THILLY. — The fact that mind can be studied in connection with matter does not make psychology a branch of natural science. Psychology is interested in a unique body of facts, and a perfect knowledge of their material antecedents would not give us a knowledge of mind as such. The argument that physiological states are the real things and brain knowledge the only scientific knowledge rests on the questionable metaphysics of materialism. Even if it were true, the psychologist would go right on studying the so-called effects of brain states, for knowledge of brain motions would not tell the whole story; but our knowledge of what is going on in the brain does not yet form a complete science. Besides, the brain physiologist cannot take a step in the construction of his hypotheses without psychology. If the psychical states could be deduced from their physiological causes, the physiologist could ignore psychology, but there would still remain a more direct way of studying mind for the psychologist. The argument is also urged that the mental series does not form a continuous line, that a closed causal nexus and hence science exists for external nature only, and that to be scientific psychology must become a natural science. We answer: More careful observation may disclose the missing links, and where this fails we can have recourse to hypotheses. Besides, there are gaps in the physiological line also, which are bridged over by theory. Finally, if psychology is impossible because of breaks in the mental causal series, cerebral physiology is impossible for analogous reasons and because we then have no key with which to open the secrets of the brain. The view that psychology is a natural science because it employs the methods of science is also untenable. The psychologist uses the objective methods but introspection is everywhere his basis and guide. Experiment facilitates, corrects, and controls introspection. Measurement forms but a

small and unimportant part of the problem. In conclusion, affiliation with philosophy is in the interests of both fields. Psychology is indispensable to the other philosophical studies, while the aims and problems peculiar to the latter help to give direction to the former. Interest in philosophical problems fixes attention on mental states, which the scientist is apt to ignore because he can find no physical antecedents for the same, acts as a safeguard against a false mental atomism, and tends to keep in view the unity of mind. The relation of psychology to metaphysics is not to be conceived as an *a priori* construction of the facts of psychology from metaphysical principles. But if dependence on metaphysics means that psychology must start out from some broad assumptions and must have recourse to hypotheses in attempting to explain, then psychology depends on metaphysics. There is no absolutely presuppositionless psychology.

PROFESSOR ANGELL. — Ought psychology to continue indefinitely its allegiance to philosophy or should it enroll its name under the banners of the natural sciences? Professor Münsterberg has warmly defended the first alternative. President Hall is no less fervent in his espousal of the second. For my own part I refuse to recognize either the necessity or the wisdom of taking any overt measures looking toward the one step or the other. And the absence of such a necessity I regard as eminently fortunate, for psychology is just beginning to gain the respect of the scientists and she has not as yet wholly lost that of the philosophers. She is therefore in too delicate a position gratuitously to alienate the sympathy and support of either of these powerful allies.

As a matter of fact, apart from the question of the label by which we shall classify psychology — and this is evidently a somewhat academic issue — I do not see how any serious divergence of opinion is possible upon the point under consideration. That our Harvard friends have put their psychological laboratory in this superb building devoted also to philosophy does not raise in my mind the question as to any impropriety in this cohabitation, but rather a sense of the gratification which each party to the contract ought to feel in such admirable companionship and in such stately and appropriate quarters. Certainly I should gladly accept for myself, were it offered, a laboratory so excellently appointed, even though my neighbors in the building were such psychological outcasts as lawyers or doctors. Mere physical juxtaposition means little, unless it embodies an avowal of spiritual dependence or affiliation which evidently is no necessary part of it.

In this particular instance, however, there is a high degree of spiritual intimacy which must make the companionship of the contracting parties extremely profitable to both. But this is by no means to maintain or admit that this companionship is the only one congenial and advantageous to them. Everyone knows that psychology has for the most part a philosophical lineage, and that certain highly important foundations of psychology, even when it is regarded as a natural science, must always be of a philosophical character. Any proposition, therefore, permanently to estrange these two must be regarded not only as ill-advised, but also as impracticable. On the other hand everyone is equally well aware that in many of its methods and most of its ideals modern psychology is approaching the position of the sciences, and especially the biological sciences. Consequently, unless one is ready to indict the whole spirit of the contemporary movement, it seems imperative to countenance and encourage the most intelligent appreciation by psychologists of those forms of scientific procedure which they are likely to wish to appropriate. Such intelligent familiarity they can only attain through intimate association with these sciences.

The general intellectual poise which philosophical training affords cannot be sacrificed by psychology without the most disastrous consequences. But at the same time psychology just as surely needs the invigorating contact of the natural sciences. Indeed, it does not seem too much to claim that psychology has a peculiar mission at this precise juncture in the bringing together of the interests of philosophy and natural science. Certainly no other science is in so strategic a position for the accomplishment of this purpose.

PROFESSOR TAYLOR. — The affiliation of psychology appears to be with the natural rather than with the philosophical sciences. It is distinguished from the abstract philosophical sciences of formal logic and mathematics by its dependence on empirical premises ultimately based upon the testimony of direct perception, involving in their meanings reference to a particular moment of time. In this respect it resembles the empirical sciences of empirical nature. Nor do the allegations that it deals only with the 'individual objects' and non-quantitative processes afford a satisfactory basis for distinguishing it from the natural sciences. It differs again from both the abstract and concrete philosophical sciences (ethics, philosophy of religion, philosophy of history, etc.) in making no use of the concept of ideal norms of value.

The Definition of Feeling. By HENRY RUTGERS MARSHALL.

The word 'feeling' is used in common speech to designate (1) touch, (2) the organic sensations, (3) emotion, (4) pleasure-pain, and (5) mere emphatic experience as such. An examination of each of these forms of our mental life shows that feeling can be identified with no one of them.

A search for some emphatic characteristic of all the forms of experience in the description of which the word feeling is used by psychologists leads us to see that we have such a characteristic in 'subjectivity,' in the use of which word we express the fact that the mental states thus referred to bear a close relation with the empirical ego.

This leads to the thesis that 'feeling proper' is a certain vague mental form which when more clearly defined develops into the empirical ego of self-consciousness. Feeling is thus the empirical ego which has not yet become explicit. (This paper appeared in full in the *Journal of Philos., Psych., and Sci. Methods* for January 18.)

The Definition of 'Feeling.' By H. N. GARDINER.

Examination of the various derived meanings of the term 'feeling' as commonly used shows a reference, in most cases, to an experience analogous to certain features of tactile and bodily contact sensations, namely, immediacy and intimacy of acquaintance, obscurity of content, tentativeness in the movement towards more definite consciousness and direct qualifying identification with self. A psychological use of the term should keep as closely as possible in touch with the common meaning. Hence it should not be applied exclusively to the pleasure-pain and allied phases of consciousness, however general and important. The usual definitions of feeling limiting it to such phases are insufficient. 'Feeling' may be defined as the immediate consciousness of the modification of individual experience as such; *a* feeling, as the content of consciousness, however constituted, regarded as the immediate modification of such experience. Primarily the self is constituted of a *felt* manifold of qualitative differences, and such a manifold, constantly changing, persists as the basis of the distinguishing functions of the mental life. (This paper appeared in full in the *Journal of Philos., Psych., and Sci. Methods* for February 1, 1906.)

Discussion of the Two Preceding Papers.

JAMES R. ANGELL. — The desirability of a definition of feeling has been especially felt by those called upon to teach psychology. It is necessary to define feeling more or less arbitrarily. Subjective refer-

ence must be the most important element in a definition. We should be cautious with Mr. Marshall's 'empirical ego' because there is even less agreement as to what it is than there is about feeling. Moreover, it is difficult to distinguish subjective reference as an occasional cognitive function from subjectivity as an existential condition, as 'matter of being,' in Ward's phrase. Nevertheless, if feeling is to have psychological status emphasis must be placed on its subjective character, and then we must proceed to explain precisely wherein this consists.

G. M. DUNCAN. — There would be a gain in accuracy and in scientific progress by discarding the term 'feeling' altogether, as it, like the terms 'consciousness,' 'perception' and 'sensation,' is unsuited for use in a scientific terminology in consequence of its many and popular connotations. If used, it seems especially undesirable to give it the wide generic sense of 'thought' and 'idea,' as those terms were employed by the Cartesians and by Locke, respectively. 'Affection,' or 'affective psychosis,' was the meaning (and term) preferred. Taking feeling in that sense, it was held that imperfect psychological analysis or philosophical preconceptions only could lead to identifying it with mere pleasure-pain. Our feelings have, *qua* feelings, quality as well as intensity, and can be arranged along an ideal scale as higher and lower. Wundt's doctrine of the tridimensional nature of feeling was criticised as lacking in satisfactory evidence; the second and third elemental characteristics not being regarded as feeling proper at all, but rather as effects or accompaniments, organic or mental, which are confounded with affective states proper. Agreement was expressed with Marshall and Angell in the emphasis laid upon the characteristic of 'subjectivity' as of the essence of feeling; feeling being 'subjectively subjective.'

G. STANLEY HALL. — Five years ago the speaker collected a great number of definitions of feeling with a view to studying the question, but laid them aside as being quite unprofitable. It is entirely delusive to attempt to define feeling. Definitions are the last product of development. The important thing is to collect illustrations of the emotions, curves of interest, physiological reflexes, etymologies, studies of dictionaries, histories, etc., and manifestations of feelings in animals. Intellect was first studied by psychologists in detail, then came will, and feeling is now on the docket. Knowledge and description of facts, and above all development histories, are the best possible definition. Words must not take the place of things. If feeling must be defined it covers the whole of mental life. Consciousness, as in strong feeling, is subordinate to feeling. Feeling is wider and older genetically than

intellect or will, and in a sense is better, *i. e.*, more immediately known. To fall back on definitions is dangerous. Confession of ignorance, that we know nothing about feeling, is best.

CHARLES H. JUDD. — Feeling is recognized as peculiarly subjective in character, and it is a common attribute of all mental states. It is often described as vague. This description is due to a wrong effort to force feeling into the categories of cognition. A state may be vague as cognition and yet be emphatic and distinct as feeling. Taking into account the subjectivity of feeling, its universality, and differentiation from cognition, we are led to recognize the intimate relation of feeling to the expressive side of mental life. Every mental state has as one of its constituents an 'attitude.' This attitude is an expression of the empirical ego; it is always present; it may have a clearness of its own even when its grounds, or cognitive justifications, are vague. If the word 'attitude' is freely used where 'feeling' occurs in psychological discussions, the significance of this view will become apparent.

MARGARET FLOY WASHBURN. — Feeling in its broad sense may be defined as the unanalyzed and unlocalized part of consciousness. We should distinguish between (1) processes that do not happen to be analyzed or localized at a given moment, because not in the focus of attention, as for example a name that one is trying to recall; (2) processes that are not under ordinary circumstances analyzed or localized, such as the mass of organic sensations making up emotion, or the 'feeling' of effort; and (3) processes that ultimately resist all analysis and localization. Under this third head belong the so-called relational elements, vestiges of primitive motor attitudes, and pleasantness-unpleasantness, corresponding to the positive and negative reactions. Pain, being localized, should be classed under the head of sensation rather than feeling. (Miss Washburn's remarks appeared in full in the *Journal of Philos., Psych., and Sci. Methods* for February 1, 1906.)

Attention and Interest. By WM. H. BURNHAM.

Attention is said to depend upon interest. It is equally true and quite as important that interest depends upon attention. The word interest, as everybody knows, is used in two senses: (1) as practically all psychologists agree, it denotes a complex state of feeling; (2) it denotes a permanent habit of preperception. Even in our standard psychologies these two meanings are often confused. If the word interest is used in the latter sense, to signify a permanent habit of pre-

perception, nobody will deny that attention depends upon interest; but this is merely saying that our present preperception depends upon our past habits of preperception. If, however, by interest is meant the affective state, there is no adequate justification for saying that attention depends upon it. Attention is a reaction of the whole organism, comparable to the tropisms of plants and animals. We must suppose an affective state correlated with this reaction. This affective state is interest. The least we can assert is this correlation; the theory here supported is that *the feeling of the organic adjustment in attention is the interest*. Stated in this way it is practically a corollary from the Lange-James theory of emotion.

While with legitimate heedlessness we may continue to use the popular phraseology in regard to attention and interest—just as we say that the sun rises and sets—in our special psychology of attention it is confusing to teach that attention depends upon interest. Not only the popular but the psychological uses of the words interest and attention are misleading survivals of an obsolete science; and in pedagogy this usage has led to great confusion and error.

Of course, any such account of the processes of attention and interest does injustice to the complexity of the actually existing mental states. The process of preperception determines not merely the aspects of an object to which we attend, but to a great extent the intensity and coloring of the affective state, that is, the interest. That this may occur in a short-circuited manner—the preperceptive images being associated with affective states, or, if one prefer, they themselves having an emotional coloring—there seems to be no reason to deny.

Excursive Attention. By J. P. HYLAN.

The tendency of recent researches which indicate the impossibility of a simultaneously divided attention calls for the recognition of the real nature of the phenomena that have been studied. This appears to consist of the habit of rapidly shifting from one object to another, and hence is made up of a series of successive acts. This wandering or shifting of direction is different from concentration on the one hand or mind-wandering on the other. Excursiveness is the term proposed for it, and excursive attention to indicate the form of attention which goes with it.

Not only the inability to divide the attention, but also the rapidity of mental fatigue, makes excursiveness a necessity. This is especially the case in perception. Evidence of this comes from a great variety of experiments and also from the explanations of optical illusions and from introspection.

While in perception excursiveness is of a reflex type and appears largely as an unconscious method in judgment and when trying to keep track of a number of things at the same time, it is more often conscious and voluntary. Almost any trade or active occupation illustrates this to a greater or less extent. It is especially prominent in administrative work and the control of large business undertakings. While the power of concentration of attention is a predominant aim in mental training, excursive attention is no less essential to the needs of practical life.

The Psychology of Organic Movements. By I. MADISON BENTLEY.

The psychologist's interest in organic movements depends, in large measure, upon the systematic point of view from which he regards consciousness. In order to avoid partisan bias and clearly to set forth the essential relations obtaining between psychology and movement, it is necessary to distinguish 'motor' *facts* from 'motor' *theories*.

The factual relationships of movement and consciousness furnish data common to all psychologies. These relationships may be indicated by an enumeration of the specific problems into which movement enters as a primary factor. The specific problems once stated may be disposed of in either of two ways; they may be referred to, and absorbed in, the general psychological system, or they may be subsumed under some single, all-inclusive 'motor' theory.

General motor theories are of two types; the first type emphasizes the motor *conditions*, the second the motor *consequences* of consciousness. Ribot's theory of attention and Münsterberg's *Aktionstheorie* are theories of the first type; while the biological trend, which appears in several varieties of 'functional' psychology, tends to encourage theories of the second type. A consideration of the psychology of 'coördination' and 'adjustment' leads to the conviction that the primary postulate of this psychology is a conscious *activity* which may be identified with attention, and that this activity, as the chief agency in the production of adaptive movements, stands in need of careful definition and description.

Modified Causation for Psychology. By G. M. STRATTON.

The admission that two mental events or a mental event and a physical event are not parts of a continuous process and are not equivalent in quantity, seems at first sight to settle the question as to a casual connection between them. But we must remember that our idea of cause, while in part *a priori*, is also in part empirical; and the empirical elements in it have been derived mainly from our observation

of physical objects. The idea of causation most serviceable in physics, however, need not be the one best fitted for the study of the larger world which includes both physical and mental events. Indeed, it would seem well to make 'concomitant variation' our chief criterion of causation here, and to back it with the other 'canons of induction,' but not to require any quantitative equivalence or any kind of qualitative continuity. Philosophy has never felt bound to regard physical causation as the sole type of causation; and psychology may feel quite as free.

Psychical Energy. By WILHELM OSTWALD.

Since the time of Descartes matter and mind have been regarded as utterly different parts of the world, extensity being the characteristic property of matter and thinking that of mind.

Psychophysical parallelism appears to open the only possible way of bringing the mental processes into relation with the corresponding physicochemical or physiological processes in the nerves and the brain, as long as one keeps to the assumption that these physicochemical processes are nothing but mechanical processes going on among the atoms of the brain. This fundamental assumption of mechanical materialism is generally taken for granted, and notable philosophers have even endeavored to prove that it is the only possible assumption for the understanding of the physical world. Only in recent times has this assumption been criticized and turned out to be nothing but an arbitrary hypothesis.

In the present state of our knowledge the only safe and sound theory of the physical world is the energetical one. Every physical fact can be described in terms of energy without the help of any arbitrary hypothesis; it is therefore possible to state the whole empirical content of every physical fact or relation by describing the energies involved as to their kind of magnitude.

As energy is by far the larger concept as compared with matter and motion — electricity for example can not be described in terms of the latter, while it can be described in terms of energy — it seems possible to extend the concept of energy so far as to include mental facts as well as physical ones. While psychical facts cannot be considered as mechanical ones, there seems to be no contradiction in considering them as produced by certain changes of energy. We are justified already in assuming that the process going on upon excitation along a nerve is an energetical one. What kind of energy is involved we do not know; the slow rate of propagation disproves the electrical nature of this process, which was assumed in former times. It may

be a kind of energy of its own, or else a peculiar combination of two or more energies. Now between unconscious nerve- and brain-processes and conscious ones there is no sharp distinction; therefore the inference is justified that there is no essential difference between them as to their nature, *i. e.*, that conscious mental processes also are energetical ones.

To make this point clear, we will assume an ideal experiment. Suppose we know exactly the amount of all the energies a human body is built from, and record the quantity of each in every instant. If then this human being starts a mental process, part of the chemical energy of the brain would disappear as such, without appearing at the same time in another known form; it would assume the state of mental or psychical energy. When the mental process is stopped, just this quantity of energy would appear in another form, probably as heat.

Unless this experiment or an equivalent one is carried out, the theory of psychical energy remains in the state of a protothesis, *i. e.*, as a probable but still unproved inference from experimental facts. As this theory is the only one which opens a way to connect the inner and outer world by a functional relation, it has a distinct advantage over the theory of psychophysical parallelism, which is no theory at all, but only an arbitrary declaration that no such functional relation exists.

Introductory Remarks on Coöperation. By CHARLES H. JUDD.

Such suggestions as are made in this paper are based on the conviction that each laboratory must determine its own problems and methods of investigation. Within the limits thus set for coöperation there are four directions in which it is profitable for the Association to consider the possibility of more intimate relations between laboratories and departments.

1. A committee of the Association might very profitably bring together information regarding apparatus. Many laboratories are prepared to furnish certain pieces of apparatus but do not find it possible to announce this fact extensively. Many new laboratories find it very difficult to secure information regarding good apparatus.

2. The possibilities of coöperation in the publication of psychological results are by no means exhausted.

3. The interests of different psychologists could probably be better served by dividing the Association meetings into small sections of psychologists who would have more discussion of their particular papers than is possible in the general Association meetings. The desirability

of such separation of special interests is now manifesting itself in the tendency of the experimentalists, for example, to have a separate session during the spring recess.

4. It would be profitable for the Association to devote more time at its regular meetings to the discussion of methods of instruction and to the discussion of courses in the different phases of psychology.

A Sketch of a Beginner's Course in Psychology. By E. C. SANFORD.

The form of the following course is determined by three considerations: (1) The universally accepted pedagogical principle that one must begin to build upon the foundation of such knowledge and interests as the pupil already possesses; (2) that a wide basis of general acquaintance with psychological facts is essential to satisfactory progress; and (3) that a genuine interest in science for its own sake is a late development in knowledge of any kind. The course should then begin with what is not far removed from the habits of thought and the practical interests of the pupil, and progress, with abundant contact with concrete psychical facts, to those things that are of interest as matters of pure science. Such a course might take up the following topics in something like the following order:

1. Psychology of Learning and Acquisition: Memory (including mnemonics) with its helps and hindrances; habit; practice, acquisition of manual skill and dexterity, learning of languages, and of complex mental operations. (Attention, emotion, volition, fatigue, interest, etc., to be treated incidentally as necessary.)

2. Psychology of Truth and Error: Illusions; prejudice; superstition; delusion; Bacon's idola; mob psychology; psychology of testimony, of logical reasoning and the fallacies. Evolution of general ideas, and origin and nature of belief.

3. Psychology of Emotion: Nature and laws of strong racial emotions — fear, anger, and love; their biological purpose and their hygiene. Psychological basis of aesthetics; the intellectual emotions. Psychological basis of ethics.

4. Psychology of Personality and Character: Types of character; temperament; the criminal, pauper, mystic, philistine, the natural leader and born henchman. The formation and influence of ideals. Psychology of the will; hygiene and diseases of the will.

5. Facts of the Interdependence of Mind and Body: The permanent and the alterable in the human make-up, heredity and acquired characters; the nature and evolution of instincts, the nervous system (anatomical and physiological) as the basis of these. Hypnotism.

Chief forms of nervous and mental disease. Neural and mental hygiene.

6. Psychogenesis: Biological view of mind and the history of mind in the animal series. Human psychogenesis.

7. Brief review and systematization of the facts already presented: Systematic psychology.

It is to be understood throughout that all these topics are to be presented as concretely as possible, with demonstrations, class and individual experiments, introspections, guided and free, and whatever other means may be possible.

In defense of such a program it may be said, first, that as every mental process involves psychical factors of all kinds there is really no *natural* order of presentation for the subject, and that in teaching the pedagogical requirements should be determining; and, second, that the average beginner in psychology knows enough of the meaning of words to make such a mixed order of treatment possible. The purely logical order often followed has advantages, but they are over-balanced in the writer's opinion by the tendency to too great abstraction in the beginning and by the necessary assumption of a theoretical and genuinely scientific interest—something rarely present first and usually to be reached only at the end of a good course.

Discussion of the two preceding papers.

E. A. KIRKPATRICK.—Regarding coöperation the speaker suggested that the Council, when considering what shall be done with the accumulated funds of the Association, should deliberate upon the advisability of employing a paid secretary who, in addition to the usual duties of a secretary, should undertake to organize a bureau of information and exchange. In regard to the teaching of psychology, he said that while none of us teach or justify the teaching of the dogmatic psychology condemned by Miss Calkins, yet the result of our teaching upon the minds of beginning students is often the same as if it were dogmatic. Unknown to ourselves we are likely to thrust upon their minds the mass of facts and general truths reached by psychologists and expressed in technical terms, before the power to observe mental processes and to think clearly about them has been developed. Even the best students who have already done a good deal of observing in what they call the study of 'human nature' often fail to recognize familiar truths when arranged and named in the psychological classification and terminology. We have had the ideal course described by Dr. Sanford this year. Let us next year have a conference and re-

port what we have actually done in teaching beginners psychology during the year and the results.

HERBERT G. LORD. — The speaker contended that, in both the subject matter and method of teaching the elements of psychology, the tendency was to be unconscious of the ignorance and mental confusion of the beginner. The instructor's very familiarity with the subject was his misfortune. He knew too much and talked over the heads of most of his students. The ideal text-book could be written and taught by a man whose youth was not dead and buried. This condition of mind of the beginner rendered the lecture method of instruction the very worst conceivable.

WALTER T. MARVIN. — The speaker agreed with Professor Sanford's paper as presenting an ideal, especially in the way of subject matter, though one hardly realizable. The chief problem in any course is: What precisely does the teacher wish the student to learn, as distinguished from all the illustration, exposition, etc., that may be found helpful? In short, every course should include a body of definite and precise information to be thoroughly learned, hard as it may be to secure such information in psychology as compared with the exact sciences.

We cannot educate general functions, but perhaps one of the special habits we can form in the brightest pupils is reading interesting books on psychology. This might be possible, especially under the preceptorial system at Princeton or some similar system.

C. E. SEASHORE. — The speaker called attention to the fact that one may see three distinct theories in regard to the place of experiment in elementary courses embodied in the construction of laboratories at the present time. In making provision for the first-year students some laboratories provide large lecture rooms seating two or three hundred students, others provide moderate-sized lecture rooms seating from thirty to fifty, and still others provide small rooms or booths for the accommodation of the individual experimenter. The first and the third are undesirable: the failure of the large class lecture is notorious, and first year students cannot profitably pursue the individual experiment. Experimental demonstrations should be used very freely with the beginning students in moderate sections such that each student can follow the experiment, question, or be questioned. A three-hour course throughout the first year may well be devoted to the teaching of facts, richly illustrated and applied; the individual laboratory course may be reserved for those who desire technical training, which will not be more than one tenth of the beginning class.

S. I. FRANZ. — The speaker remarked that in his opinion under present conditions there could be little coöperation between the laboratories in universities and in insane hospitals. If, however, more psychologists appreciated the importance of and showed interest in the mentally abnormal, more helpful relations would be brought about. The hospitals are primarily for the care and treatment of patients and secondarily for research and education. The hospitals cannot well take up the teaching function, but many institutions are willing to grant to well-trained workers opportunities for investigating the mental condition of the insane and the feeble-minded. The opinion was expressed that much of value to normal psychology could be obtained if more attention was devoted to these mental conditions, which are principally exaggerations and diminutions of normal functions. Casual visits to insane hospitals, however, do not give an adequate idea of the material or its value. A period of time corresponding to a university semester could be profitably spent by students of psychology in the study of the insane or feeble-minded. Such a period of time would be sufficient for the psychological investigator to obtain an insight into the problems and the material, and the hospital would be repaid by the research which could be accomplished.

R. S. WOODWORTH. — Coöperation is perhaps most needed in the way of mutual criticism. Published results in psychology often remain for years neither generally accepted nor rejected, because they are not critically threshed out nor experimentally tested by other psychologists. Our standard of productive work would be raised by giving serious and critical attention to each other's results.

In the usual introductory course of psychology, the student is referred mostly to his own experience for data. He is not taught new facts so much as a new point of view. It is at least worth considering whether a course could not be arranged which should — as in the other sciences — present him with facts entirely new to him. The great difficulty with such a course would be the selection of really valuable facts; the more recent literature is richer in such facts than the older literature on which most text-books are based. It would also be difficult to make the course systematic. It should, without doubt, be an experimental course with laboratory work.

EDWARD COWLES. — Mental physiology is essential to mental pathology, and psychology would be greatly aided by the study of functional modifications under pathological conditions. The insanities can be studied to advantage only in hospitals for the insane; the possibility of coöperation between these institutions and the teaching of

psychology depends much upon what is wanted. The general demonstrations of a hospital clinic to a class can be given usefully and as practicably to psychological students as to medical students; comparatively few of the latter get more than that under the present conditions of teaching psychiatry. It would depend upon such a clinic being available near enough to a college. The difficulties include the want of time and interest of busy institution officers in the specially psychological aspects of the cases. As far as research in psychological problems is concerned little can be accomplished except in a hospital where a laboratory for psychological experiment is provided, and actual clinical work is being conducted by a competent investigator. Under such circumstances a student having the privileges of a period of residence, or of daily observation, might profitably undertake the work of special research. Such circumstances are so exceedingly rare that I know of only one place in this country, and of that Dr. Franz has just spoken. The hope is that the value of such laboratory work in its immediate service to the patients will become appreciated. This is already apparent enough as a matter of fact; and it is hopeful that hospital authorities can find a reason for granting such privileges in the fact that it is a benefit to the institution to have such contributions of research work to its own service.

ADOLF MEYER. — The speaker regretted that courses in psychopathology, in their coöperation with hospitals for the insane, unfortunately follow as a rule the scheme of filling the students with a collection of the most clean-cut pictures from the literature, and then use a demonstration of actual cases in hospitals merely as an illustration. This scholastic method does more harm than good, and it is urgently desirable that students should become more familiar with the actually accessible facts of observation and less intoxicated with abstract presentation of the attractive unusual. Courses in psychology as usually given form a very inadequate preparation for work in psychopathology. Dr. Sanford's plan would more adequately meet the needs than the very dogmatic laboratory psychology which spends such an excessive amount of time on the study of sensations that it is forced to exclude the study of the development of instincts, which would form a much more adequate avenue to the study of psychopathology.

(Remarks were also made by E. B. Delabarre, E. A. McC. Gamble, Robert MacDougall, E. L. Thorndike, the president and others.)

The Doctrine of Specific Energies. By C. LADD FRANKLIN.
(Read by title.)

The Possibility of Retinal Local Signs of the Third Dimension.

By W. P. MONTAGUE. (Read by title.)

The Color Sense of Young Children. By W. S. MONROE.

Four hundred children between the ages of three and six years were tested with the spectrum colors along the four lines: (1) ability to match colors; (2) ability to name colors; (3) color liked best; and (4) favorite color combinations. Sex differences were not pronounced, although the girls matched and named colors slightly better than the boys. Ability to match and name colors increased with years. Red was at all ages and with both sexes oftenest matched and named correctly, and blue ranked second. Orange and violet were least often perceived and named correctly. Red was the favorite color, blue second, violet third. Red was most often used in color combinations and blue came second. Green was most frequently matched, named and used in color combinations by the children of Irish parentage. Ability to name colors correctly lags much behind the ability to match colors correctly. Standard colors are generally preferred to shades and tints. Black and white are probably known much better and much earlier than the spectrum colors. There are marked individual differences in the ability of young children to name and perceive the spectrum colors.

Primitive Color Names and the Primary Colors. By J. W. BAIRD.

Philologists have found that many of the languages of antiquity are characterized by a poverty and indefiniteness of color-vocabulary. They have found too that in numerous instances names for red and yellow were evolved at an earlier period than names for green and blue. Anthropologists report that certain primitive races of the present day possess a normal (European) sensitivity to red and yellow but a subnormal sensitivity to green and blue. Certain observations upon children are said to have yielded a similar result. And archeologists have discovered that the sculptors of antiquity made ludicrous blunders in their use of blue pigments, while red and yellow pigments were applied appropriately.

From this mass of evidence two general conclusions have been drawn: (a) The color sense is of comparatively recent acquisition. It was wholly lacking in our early human ancestors; even so late as the Homeric age man was totally color-blind; (b) The evolution of the color sense has followed the spectral order—from red through yellow and green to blue.

There is reason to believe that both these conclusions are erroneous. (1) The philological argument is based upon the untenable assumption that the development of color names has always and everywhere kept pace with the development of color sensitivity. (2) It seems incredible that a function so highly differentiated as the color sense could have been evolved in the course of a hundred generations (Homer to the present). (3) Moreover, the fact that many of the lower animals seem to be able to distinguish colors makes it seem improbable that any race of mankind, however primitive, was totally color-blind. (4) The archeological argument loses its force unless one grant that artists have always aimed to make facsimile copies of their originals. Moreover, archeological remains (Persian and Egyptian) show that green and blue pigments were correctly employed at a pre-Greek period.

It seems probable that the colors of the red end of the spectrum were named at an earlier period than those of the blue end, but this does not necessarily imply that our color sensitivity has followed the spectral order in its development. (5) The fact that blue pigments were relatively inaccessible to primitive man undoubtedly had its influence upon the evolution of a color terminology. (6) The relatively late appearance of names for green and blue may be referred to a lack of interest in these colors—a lack which is common to primitive races and children. (7) The fact that dark-skinned races are relatively insensitive to (green and to) blue may be explained in terms of a deeper macular pigmentation (*cf.* tests of indirect vision, Virchow, Rivers) and not at all in terms of an absence from the retina of blue-sensing substance. Indeed, certain very primitive peoples are not less sensitive to blue than to red (Woodworth).

The phenomena of indirect vision clearly indicate that the color senses were evolved in pairs, and in the following order: first black and white, subsequently yellow and blue, and finally red and green. This view is supported by the circumstances (*a*) that the zones of color sensitivity have a paired arrangement upon the retina, (*b*) that the black-white substance has the widest, and the red-green substance the least wide retinal distribution, and (*c*) that the red-green substance is most readily fatigued while the black-white substance possesses the greatest tenacity of function. Our view is also supported by the fact (*d*) that in case of atavism of the color sense (color-blindness) the red-green function is the first to be lost. It is further confirmed by (*e*) the order of disappearance of the color zones in hysteria and in progressive atrophy of the optic nerve.

A Study of After-images on the Peripheral Retina. By HELEN B. THOMPSON and KATE GORDON. (Read by Miss Gordon.)

Experiments were made upon the peripheral retina of the light-adapted eye. Nine pigment colors served as stimuli. The after-images of these colors were cast upon backgrounds of varying brightness. It was found that: (a) The color-tone of an after-image is modified by the brightness of the background upon which it is thrown. Upon a dark ground the darker color-element is emphasized, and upon a light ground the lighter color-element. Thus a carmine after-image looks bluish-carmine on a dark-gray ground, but reddish-carmine on a light-gray ground. (b) A dark ground tends to bring out the stimulus color, but to suppress the after-image; whereas a light ground tends to suppress the stimulus color, but to bring out the after-image. It is possible for a subliminal color stimulus to produce a supraliminal after-image of appropriate color-tone; a carmine seen as gray produces at times a distinct green after-image, and a green seen as gray a carmine after-image. (c) Finer discriminations were made in the red-yellow end of the spectrum than in the blue-green end, both in stimulus and in after-image, for, (1) on the part of the retina where the stimuli red, orange and yellow were distinguished from one another their after-images were not differentiated, *i. e.*, each of these three colors produced pure blue after-images, and (2) on a part of the retina where the stimuli green-blue, blue and violet were not distinguished from one another, but all appeared blue, the after-images to these colors were differentiated, being respectively orange-red, orange and greenish-yellow.

Visual Adaptation in Tachistoscopic Experimentation. By JOHN A. BERGSTRÖM. (Read by title.)

The apparatus employed in these experiments is a new type of tachistoscope, essentially like one figured and described by the writer in the *Indiana University Book*, pp. 94-95, 1904. In experiments with the apparatus, the preparatory adaptation, or the lack of it, may be of several kinds, most of which permit quantitative variation. An experiment consisted of ascertaining what variation would be produced in the apprehension and reproduction of a series of eight or nine letters under any one of a number of specified experimental conditions.

Discrimination of letters is not a very sensitive measure of the degree of adaptation; they can, of course, be read in light of very different degrees of intensity, so that considerable changes in brightness might occur and be noticed without corresponding changes in the record appearing. In general, adaptation by means of the translucent

screen with a brightness somewhat below that of the flash (10σ) seemed best and gave the best records. While there would be some error from unfavorable conditions of adaption in tachistoscopic experimentation, my impression is that so much can be effected by training that the error from this source would not be so great as some critics of such work seem to assume from observation of the effects of adaptation in everyday experience or in the usual laboratory experiments.

Photographic Studies of Convergence. By C. H. JUDD.

The investigations reported in this paper were made by the photographic method described in the *Yale Psychological Studies*, Vol. I, pp. 1-20. The eyes of two observers were photographed during movements of convergence and divergence. In no case studied did the two eyes make movements of convergence at the same rate. One eye regularly moved more rapidly than the other, the differences in time being on the average the difference between 260 sigmas for the rapid movement and 400 sigmas for the slower. In divergence the difference in the rate of movement in the two eyes was not so marked. Very often the eye which converged more slowly made a sympathetic lateral movement corresponding in direction to the movement of the eye which moved rapidly. This tendency to sympathize was very marked when the line along which the fixated points were placed coincided with the line of fixation of one of the eyes.

These facts show that even in fully developed adult convergence the movement is not wholly automatic and independent of the retinal images which arise during movement.

On the Influence of Reflex Stimulations to Eye-movement upon Judgments of Number. By ROBERT MACDOUGALL.

This investigation sought to trace in our numerical judgments the influence of the varying system of stimuli to reflex eye-movements which the visual field presents, in a way analogous to the effect which these stimuli exert upon our judgments of distance and quantity.

The materials consisted of twenty to thirty scraps of black and colored paper scattered over a constant area, judgment was given in terms of a comparative estimate of two groups simultaneously presented, one of which was arranged with a view to produce a greater reflex stimulus than the other. A series of such comparisons was made, involving brilliancy of coloring, contrast with background, focalization and oscillation of vision by *points de repère*, comparison of horizontal and vertical eye-movements, etc.

The observer's estimation of the number of objects presented

seemed throughout to be affected by such arrangements, but no quantitative comparison of the influence of the various factors introduced was feasible under the methods adopted.

Vision during Dizziness. By EDWIN B. HOLT.

The stimulation of the semi-circular canals produced by rotation of the head and body, results in a nystagmus of the eyes. The direction of these eye movements depends on the position of the head during the rotation, *i. e.*, the canal that is most effectively stimulated. In every case this direction lies in a plane normal to the axis of rotation: The nystagmatic movements (back and forth) are always such that the movement is slow in one direction, more rapid in the other. The rapid movements can be voluntarily inhibited, the slow cannot; that is, the eyes can be held still on the side toward which the slow movements bring them, but not on the other side. Both eyes move together and similarly. (These movements are illustrated by photographs of the eyes during the dizziness produced by rotation with the head held vertical. Speed and the extent of the two kinds of movement measured.)

Now the rapid movements allow no visual sensations to reach consciousness, while the slow do so allow them — as is shown by the after-image streaks observable by the subject, from a luminous point that moves (during the dizziness) at right angles to the direction of the dizzy eye-movements, and on a black field. This explains why in dizziness the visual field swims in one direction only, and not in the other, *i. e.*, why the field does not seem to swim to and fro. This fact is further verified by the behavior in consciousness of a lasting after-image generated on the eyes before rotation, and observed by the subject as to its appearance during and after this rotation. I find no mention of these facts in the literature, save for a paragraph of Delage and a parenthetical reference by Mach. Both authors have given merely their passing attention to the matter.

The nystagmatic movements are entirely consistent with Breuer's theory of the function of the semi-circular canals (which is likewise that of Mach). The rapid movements have several resemblances with those of Professor Dodge's first type; the slow ones, though belonging in that author's fourth type, yet have some features in common with those of the second type. The rapid movements, owing to 'important central factors,' occasion or occur concomitantly with a central anæsthesia.

Vision and Localization during Eye Movements. By R. S. WOODWORTH.

Vision with the rapidly moving eye (*i. e.*, during movements of Dodge's 'simple reaction type,' which I shall call 'eye jumps' for short) does not differ essentially from vision with the resting eye, or with the eye which is making a 'pursuit movement' — given only the same retinal stimulation in the three cases. The evidence for this statement is as follows:

1. In reference to the mirror experiment of Dodge, in which the eye tries to see its own motion, the result is inconclusive, because the moving eye could only be seen in indirect vision anyway, and because what would be expected from the conditions of retinal stimulation in this case is not clear vision of a moving eye, but a blurred image.

2. When the field of regard during an eye-jump encounters an object moving in the same direction and at the same speed, the object is clearly seen, as would be expected from the conditions of retinal stimulation. That this appearance is not an after-image coming to consciousness at the close of the movement is proved by the fact that it is correctly localized in space, and not projected on the background at the new fixation point, as an after-image would be. Also, the reaction time to an object so seen is not long enough to include any considerable period (.1 sec.) of anesthesia or central inhibition.

3. When a dark field presents one luminous spot, the spot is seen to jump counter to the jump of the eye, leaving behind a bright streak (the 'false streak' of Holt); after the lapse of the usual latent period, a fainter after-image streak is also seen. All this is exactly as would be expected from the conditions of retinal stimulation, and can be duplicated by moving the field past the fixed eye (most conveniently by aid of a mirror). The 'false localization' of the bright streak is simply a recognition of the direction of movement along the retina. The fact that the apparent extent of the spot's movement (length of the 'false streak') is less than the distance between the old and the new fixation points may be interpreted as analogous to the general inaccuracy of comparison of (angular) retinal magnitudes with the magnitudes of known objects in space. There are several details in the 'falsely localized after-image' experiment which cannot be explained by Holt's hypothesis; *e. g.*, when a bright spot is presented only during the middle of the eye jump, still both streaks are seen, and the apparent motion of the spot is in evidence; yet this is the period of the supposed anesthesia which cuts short the 'false streak.'

4. When the field presents no great contrasts of brightness, as in ordinary conditions, its appearance during an eye jump can once more be duplicated by moving the field while fixing the eye. An object

presented only during the movement of the field often escapes observation entirely. After practice, fusion, flicker, and apparent backward movement can all be seen during eye jumps. Entoptic specks and after-images can also be seen.

A Simple Method of Measuring Relationships. By E. L. THORNDIKE. (Read by title.)

Growth of Vocabularies. By E. A. KIRKPATRICK.

A preliminary report of an incomplete study of the size of vocabularies of pupils from the second grade to the university. The method used was that of having a hundred words (taken by chance from the dictionary) marked as known, unknown or doubtful. The results so far as tabulated indicate that the understanding vocabulary of any person may thus be estimated with a fair degree of accuracy and that those who read much possess larger vocabularies than those who do not. It also appears probable that such a test associated with a definition of some of the words may be a ready and fairly accurate means of estimating the general intelligence of pupils.

Training in Singing by aid of the Voice Tonoscope. By C. E. SEASHORE.

The speaker described certain recent improvements in the tonoscope, namely, the driving and control of speed by means of a synchronous motor, using a metal drum with siren holes, producing the standard tone directly from the drum and producing a tone of any vibration frequency within an octave by means of a selenium cell. He then stated some results of a series of experiments made by a student, Mr. E. A. Jenner, showing that training for accuracy in control of the pitch of the voice in singing (1) progresses much more rapidly, and (2) may reach a higher degree of efficiency in training by the aid of the tonoscope than in training without it. The tonoscope reveals to the singer the nature and the amount of the error of a tone to a very much finer degree than the ear can hear. Incidentally a measure of the relative difficulty of the intervals, the major third, the fifth and the octave, was obtained and it was demonstrated that, for the purpose of reproduction, these steps are approximately equal. It was also demonstrated that the least producible change in the pitch of the voice, in different parts of an octave within the middle range, is a constant fraction of a tone.

Linguistic Lapses. By FREDERIC LYMAN WELLS.

Linguistic lapses are always involuntary, central, not necessarily conscious, and referable to a physiological basis. Their five general

types are the assimilation, the dissimilation, the omission, the substitution, and the metathesis. The first, fourth, and fifth of these are generally dependent upon associative processes. The similarity of the motor and sensory lapses is only superficial. The study of lapses substantiates the view of individual localization for individual motor linguistic elements. In the sensory lapse the mnemonic factor is paramount. Metatheses are due to the weak memory for the time of events compared to that of the events themselves. The most favorable condition for both progressive and regressive sensory assimilation is a poorly perceived stimulus followed by a well perceived one. There is unconscious predisposition to certain classes of sensation in all subjects.

Comparison of the Maximum Rates of Actual and of Imagined Voluntary Rhythmic Muscular Movement. By CHARLES T. BURNETT.

The movements in question were made with the finger, the hand, the forearm, the arm, and the leg, the latter rotating at the hip. The rhythmic movements consisted of a series of back-and-forth movements through a fixed arc. The type of imagination at first employed was kinesthetic. The experiments, which were carried out with a single subject, the experimenter, and which must therefore be regarded as tentative, show that the maximum rate of imagined rhythmic movement is in most cases far smaller, and in all cases definitely smaller, than the maximum rate of the corresponding actual movement. Increase in rate occurred with practice, and in all but one limb to a greater extent with the imagined than with the actual.

The average variation for actual movements is greater than for imagined, and the variation among themselves of the several kinds of actual movement is ten times as great as of the several kinds of imagined movement. It appears, therefore, that the maximum rate of imagined movement is not determined by differences in the limbs, when the imagination is of the kinesthetic type; and that, further, the motor cue cannot be furnished by such imagination. Similar experiments carried out with the visual type of imagination show marked increase in rate, but are not yet as great as the highest rates for actual movement.

In the search for a field where the maximum rate of imagined movement should be equal to that of actual movement, eye and breathing movements were tried with the same result. The speed of auditory imagination was also tested with series made up in one case of the syllables tut-tut-tut- etc., and in another of the alternating sounds

of inhalation and exhalation; but this showed in its turn a failure to give a rate as rapid as that of the actual limb movements. The same was true of a series of touches imagined as stimulating in alternation the volar and the dorsal sides of the finger. The conclusion seems justified that in the limited field of movement under consideration the classical theory of volition does not hold.

Experiments in which the arc of imagined movement was a maximum indicated that this factor has an important effect in showing the maximum, etc.

A New Kymograph. By J. P. HYLAN.

This kymograph is designed to solve the difficulty of those who need a first-class machine but have not the funds to secure one of the Ludwig type. It consists of parts which are found ready-made in the market and can be put together by one of ordinary mechanical ability. The drum is $9 \times 6\frac{1}{4}$ inches and can be placed in a vertical or horizontal position. It is turned by an electric motor whose rate is reduced by worm gears and spur gears. By varying the combinations of these and also the resistance in the electric current a great variety of rates can be secured. A spiral record can be taken on the drum by means of a carriage which moves the marking apparatus automatically.

Investigations on Rhythm, Time and Tempo. By J. E. W. WALLIN.

I. *Qualitative Limens or Grades of Rhythm: the Psychophysics of Variation.*

This is a residual problem from the author's earlier research (*Rhythm of Speech*, 1902, p. 69). How much may a rhythmical interval be varied without affecting the rhythm? What is the form of the rhythm curve; how can it be psychophysically formulated?

The tone from a resonator passed through deep and less deep holes in a regularly revolving disc, the sounds being heard through a tube by the subject in a distant room at a rate of (a) 1.075 sec. and (b) 0.57 sec., both as trochees and as iambs, both in a continuous series of eighteen beats and in a discontinuous series with every six beats alternately silent and alternately sounding. The last weak beat in each round of the disc was varied progressively by minimal steps, and the subjects (ten) reported on the effect of this variation upon the quality of the rhythm.

The most important results are: (1) The quality of rhythm may be graded according to the degree of regularity into about five groups. The corresponding qualities may be designated as perfect rhythm,

good (shaky), fairly good, bad, and destroyed. (2) We may speak of these grades as rhythm limens, the number of limens for a rhythm corresponding to the number of steps between a perfect and disrupted rhythm. These difference limens are not sharp lines but rather broad thresholds. (3) The ranges between the limens are shorter. These interlimen spans are not gaps in the rhythm curve. We may think of them as corresponding to the spaces between the successive sensation steps in the Weber-Fechner logarithmic curve of sensation. (4) The rhythm limens follow the Weber-Fechner psychophysical law. The qualitative grades vary as the stimulus irregularity changes by a proportion of $\frac{1}{3}$ of itself. This, then, furnishes the first application of the psychophysical law to the field of æsthetics.

II. *The Difference Limen in the Perception of Time.*

This was ascertained in connection with the preceding experiment.

(1) It was invariably finer than the first rhythm limen (grade I.), due partly to the fact that the rhythm limen is a range while the time limen is a line; it stops short the moment the difference is perceived. But a difference in time is perceived before a change in the grade of the rhythm. (2) The limen is relatively finer for the longer interval, for the continuous method and for the trochee pattern (— ∪). (3) Its average size is 5.2 per cent. of the intervals.

III. *The Preferred Tempo.*

A. *The preferred tempo in a method of paired comparison of metronome clicks.* Twenty subjects listened to pairs of rates which always started with the extremes in the series (208 and 40). The preferred rate was repeated as long as it was preferred and compared with the next faster or slower as the case might be. The rates approached closer and closer with each successive trial, either toward the center of the pendulum or toward one of the ends. Thirty rates were compared and detailed introspection recorded on a number of points. Among the results may be mentioned: (1) The preferred tempos for all subjects averaged .519 sec., or about half a second. The median is somewhat higher, .579 sec. (2) The preferences for the different subjects can be arranged in four groups, slow, medium, fast and rapid; 1.169, .618, .435 and .319 sec. Half the results fall within the second group, the tempo of which approximates some of the earlier results. (3) The rate of the tempo preferred is independent of whether or not the subject is musical. It will depend upon numerous factors differing with the individual. (4) Nearly all subjectively rhythmized the clicks; but the rhythm was felt to be a pale affair as compared with the rhythm of music, notably the rhythm of the drum. The problem should be studied with rhythm at its best.

B. *The preferred tempo as measured by a method of expression.* For this purpose the motor *responses of the gallery* furnish the best material. To what rhythmical rates in the vocal and instrumental music and dancing in the theatre do the unsophisticated youths respond by stamping their feet most heartily and spontaneously? The strength of these responses can be grouped by the ear into four or five classes, and the average time for the tempo in each group calculated. (Partly finished.)

IV. *The Maximum Number of Categories of Tempos.*

The investigation is confined to the range set by the metronome. Into how many classes, groups or categories can this series of speeds be divided? What is the range of each category? (In progress.)

An Experimental Study in the Psychology of Voting. By COLIN A. SCOTT. (Read by title.)

Sex Differentiation in the Sense of Time. By ROBERT MACDOUGALL. (Read by title.)

Some Psychological Aspects of Success. By BROTHER CHRYSOSTOM. (Read by title.)

The paper was suggested by current strictures on the average college student of our day, and by Wilbur F. Craft's 'Successful Men of To-Day and What They Say of Success.' The deductions of the latter work are based on replies to a questionnaire. From these returns it appears (1) that a country farm is the best birthplace, as it favors a more extended exercise of the senses, and a better training in powers of observation (Professor Cattell's higher city birth-rate for scientific men being probably accounted for by the fact that their early education was given according to strictly scientific principles); (2) that the plastic period of education should be largely directed to acquiring a power of sustained observation and fixed attention, a condition often brought about by the necessity of working for one's living; (3) that the forming of a noble ideal of conduct and character is necessary both to strengthen the will and to offset the effects of unfavorable environment; (4) that therefore a systematic course of reflective reading is to be commended as helping to a conviction of one's ability to succeed, while cursory skimming over the average newspaper is to be deprecated as dissipating organized thought and concentration of mind; (5) that the selection of maxims or watchwords summing up the results of experience and reflection, if followed by frequent advertence to them during the day, tends to freshen mental vigor and increase personal courage; (6) that among the most valuable assets in the en-

deavor to attain success is the art of profiting by one's failures, an art to be acquired rather by intensity of application than by distribution of energy. In a word, singleness of purpose is a prime requisite for useful observation, which in turn generates interest, a condition of concentration of mind.

Early American Psychology. By I. WOODBRIDGE RILEY. (Read by title.)

Early American psychology was developed chiefly among the materialists in the middle and southern colonies. Foremost was Cadwallader Colden (*First Principles of Action in Matter* [1751], an unpublished treatise entitled *Principles of Morality* [date?], *Introduction to the Study of Physics* [1756?], *Enquiry into the Principles of Vital Motion* [1766], and *Reflections* [1770?]). As a materialist, Colden reduced psychology to a physiology of the nerves and was precursory to the coming French sensationalism. Thus Thomas Jefferson wrote to Cabanis in 1803 that thought is a faculty of our material organization. In the end, however, he preferred the intuitionist realism of his friend Dugald Stewart and argued at length in defence of the instinctive impulses of the common-sense school.

Most significant of the native materialistic works was Joseph Buchanan's *Philosophy of Human Nature* (Richmond, Ky., 1812). In his attack on the faculty school Buchanan resembles another southern physician, Thomas Cooper, whose translation of Broussais on *Insanity and Irritation* had as appendix a *Defence of Materialism* and an *Outline of the Association of Ideas* (Charleston, S. C., 1831). Belonging not to the ideologists but to the physiologists, Cooper reduces ideas, of whatever kind, to motions excited in the brain and there felt or perceived—judgment, reasoning, reflection being not distinct entities but particular states or functions of the cerebral mass. The crass objectivism of this early no-soul psychology led to the transcendental reaction toward subjectivism and the belief in the Emersonian over-soul.

FIFTH ANNUAL MEETING OF THE AMERICAN PHILOSOPHICAL ASSOCIATION.

The fifth meeting of the American Philosophical Association was held in Emerson Hall, Harvard University, Cambridge, Mass., December 27-29, 1905, about seventy-five members attending. There were four sessions for the reading of papers, an evening session on the twenty-eighth for the president's address, and three joint meetings with the American Psychological Association. The social features included a luncheon at the Harvard Union by invitation of the Harvard Corporation on the twenty-seventh, followed by exercises in formal opening of Emerson Hall; a reception the same evening by Professor and Mrs. Münsterberg; and an evening Smoker at the Harvard Union jointly with the American Psychological Association. At the business meeting William James (Harvard) was elected president, Ernest Albee (Cornell) vice-president, J. G. Hibben (Princeton) secretary, A. K. Rogers and Frank Thilly members of the Executive Council. The next meeting was arranged to be held at Columbia University, New York City.

ABSTRACTS OF PAPERS.

President's Address: *Beliefs and Realities*. JOHN DEWEY.

This address will be printed in full in the *Philosophical Review*.

December 27, Morning Session.

Swedenborg's Influence upon Goethe. FRANK SEWALL.

The paper presented a brief sketch of the wide range of Swedenborg's achievements in science and philosophy, enabling him to furnish to Goethe a comprehensive survey of the world-as-whole, including both its spiritual and its physical realms. The paper traced Goethe's acquaintance with Swedenborg through Kant, Herder, and Schiller, but especially through Frl. von Klettenberg, a devoted student of the Swedish seer. Many instances of the influence were shown. A trait not mentioned by any of the authorities cited, but testifying more deeply than any other to the profound impression which Swedenborg's doctrine of heaven left upon Goethe's mind, is Faust's finding, at the end, the 'fair moment' in the good of service to his fellow men in the redemption of waste lands and the providing of happy homes.

The Conditions of Greatest Progress in American Philosophy.
D. S. MILLER.

The social development of philosophy has only begun. We set out with systems that carry the personal stamp of their authors. We must pass to coöperative action. In its social development philosophy must be international, but this Association and other tokens show that a national branch may flourish with a growth and fruit of its own. Philosophy is not a science till a tested method has been achieved such as to produce, in some principles at least, a consensus of experts. To secure conscious advance to this end, philosophy must feel her responsibility as a teacher; here the prime end must be to reach common ground. The chief means for this end in America are: (1) To use as plain English as we can; (2) to practice a searching mutual criticism in the interest of an accurate habit; (3) to study the divergent temperaments that find satisfaction in philosophies, and (4) to draw ourselves closer to life by recognizing that *Lebensweisheit* is an essential strain in all philosophy.

The Influence of American Political Theories on the Conception of the Absolute. I. WOODBRIDGE RILEY.

The conception of the Absolute in America assumes three successive forms, being in the seventeenth century monistic, in the eighteenth dualistic, in the nineteenth pantheistic. Our problem is to show how these conceptions were influenced in their shaping by the current theories of government and sovereignty. In the creeds of the state-church, in colonial charters and state constitutions, but chiefly in the speculations of men like John Wise, Jonathan Mayhew, and William Livingston, is indicated the drift from monistic determination to the deistic severance between the law of God and the law of nature. The latter, under Puritanism a subordinate and under Deism a coördinate source of authority, becomes under Transcendentalism an independent and ultimate law. In political terms the sovereignty, first granted to the king, then shared by the people, is finally lodged solely in the democracy. Hence the analogy between the pantheism of Emerson and the doctrine of popular sovereignty.

The Kantian Doctrine of God as Compared with that of Plato and Aristotle. WILLIAM T. HARRIS.

A Philosophical Pilgrimage. Reflections of a Visit to the Homes and Abodes of Berkeley, Hume, Locke, and Descartes.
FRANCES B. BRANDT. (Read by title.)

Afternoon Session — Joint Meeting.

Discussion : *The Affiliation of Psychology with Philosophy and the Natural Sciences.* By G. STANLEY HALL, JAMES R. ANGELL, HUGO MÜNSTERBERG, A. E. TAYLOR, and FRANK THILLY.

[For abstracts of this discussion, see pp. 48-51.]

Evening Session.

President's Address of the American Psychological Association : *Psychology as a Science of the Related Self; a Mediation between Structural and Functional Psychology.* MARY WHITON CALKINS. [For abstract, see p. 41.]

December 28, Morning Session.

The Significance of Methodological Principles. ERNEST ALBEE.
Induction and the Disjunctive Syllogism. W. P. MONTAGUE.

There are two ways in which a proposition can be proved: directly, by premises that imply its truth; indirectly, by premises that imply the falsity of its contradictory alternatives. In the deductive syllogism the direct method is more natural, and it is generally assumed that the same is true in induction. The possibility suggests itself, however, that induction properly belongs to the indirect type of influence; the paper is an exposition and defense of this view. It is maintained that the inductive process by which a hypothesis is proved is essentially and exclusively a process of eliminating rival hypotheses, a process appropriately expressed not by a categorical but by a disjunctive syllogism, of which the major premise is a statement of the possible causes of a given phenomenon, while the minor is a statement of the particular observations and experiments that eliminate all of these alternatives but one. The paper pointed out several advantages resulting from this theory of induction.

Connection between Logic and Mathematics. C. LADD FRANKLIN.
(Read by title.)

Experience and Thought. J. E. CREIGHTON.

It is maintained against pragmatism that the logical problem cannot be defined completely in terms of the particular situation; thought has always, in addition, a more general and ultimate end, the realization and maintenance of a rational life. Only by reference to this end do the particular problems and acts of thinking get their significance. Again, the antithesis assumed between thinking and 'concrete ways of living' is criticized, and it is urged that experience is a single process throughout its various stages of development. Only when ex-

perience is regarded as the development of a single principle, which maintains itself in and through its differentiations, can one properly speak of its parts as 'functions' or 'in functional relation' at all.

Noon Session, with the Psychological Association.

Psychical Energy. WILHELM OSTWALD. [For abstract, see p. 57.

Afternoon Session.

Evolution and the Absolute. H. HEATH BAWDEN.

Two principles of modern science — conservation and evolution — seem to come into fatal conflict. We face the dilemma of viewing the universe either as a closed system or as a progressive growth — each of which, taken by itself, appears an untenable view. To believe that something has evolved out of nothing strikes at the rationality of the universe; while to regard the universe as a completed system destroys the possibility of freedom, initiative, progress. Professor Baldwin has shown that the question of absolute origin cannot be answered because it cannot be intelligibly asked. The earlier stages of a process — origin — can only be stated in the same terms as the later stages which we regard as exhibiting its nature. The distinction of essence *versus* origin is a functional one, having meaning only with reference to the interest or purpose in hand. The ideas of unity (conservation) and continuity (evolution) are true, therefore, only when interpreted in terms of each other. Science must assume the conservation of the system within which she is working in order to make the genetic or evolutionary statement useful, while on the other hand the continual evolution of new meanings is necessary to make the conservation doctrine intelligible. From this point of view it is possible to state the elements of truth in evolutionism and absolutism. These were pointed out in a criticism of Spencer's evolutionary position, on the one hand, and of Mr. Bradley's and Mr. Royce's absolutism, on the other.

Consciousness and Evolution. FREDERICK J. E. WOODBRIDGE.

To regard consciousness as an outcome of evolutionary processes involves a radical transformation of many of the fundamental problems of modern philosophy. The conception which has hitherto controlled them involved the positing of the mind as an original capacity or receptacle endowed with certain constitutional powers and needing the operation of some agency to give it the content known as the content of consciousness. To this line of thought the evolutionary conception presents a striking contrast. Here the mind is not posited as

an end-term, but rather processes of various sorts undergo continual reorganization until they become conscious; as conscious processes, then, they are not original but derived. The general philosophical problems arising from the end-term conception of mind become largely meaningless to the evolutionist. The mind-body controversy, for instance, appears to be wholly removed or radically transformed by evolutionary conceptions. The doctrine of 'ideas,' of a mental series of existences, numerically and qualitatively distinct from all other existences and constituting the sole objects of consciousness, is alien to the evolutionary conception; the latter, though not wholly freed from the older view at this point, is already giving us radically transformed definitions of psychical processes. When consciousness is brought within the sphere of evolution it bids fair to transform some of our stock notions about evolution itself: that process would appear to be, not the unfolding of a past, but the successive achievements of an effective present whose achievements have the character and value they disclose wherever they become apparent or are realized.

The Formal Fallacy in Subjectivism. A. E. TAYLOR.

Pure subjectivism, as expressed in the writings of many physicists and biologists and some professional philosophers, is the view that the object which a state of mind knows is its own occurrence as a mental process. This amounts to the doctrine that the relation between percipient and percept is logically such as to have itself, and nothing but itself, as its sequent or second term. But the existence of such a type of relation seems logically impossible, since it inevitably involves an indefinite regress of an illegitimate kind. To escape this, we are bound to assume that there is at least one instance of the perceptual relation in which the relation (the process) and the sequent (the perceived object) are not identical. Thus the theory of knowledge must start from the standpoint of natural realism, though it does not follow that it must end there.

Pure Science and Pragmatism. E. G. SPAULDING.

Some examples of pragmatic procedure in the sciences were examined, especially those pointed to by pragmatists themselves, in order to get at their implications, structure, etc., and compare them with the claims of 'theoretical' pragmatism. In the scientific-knowledge-experience four aspects are distinguished: symbol, meaning or content, image, and object known; the ground for the success and validity of knowledge is external to knowledge itself. Examination of the 'pure experience' position shows that at least some of its interpreta-

tions are not consistent with the dualism involved in the scientific pragmatic procedure.

December 29, Morning Session.

Scholasticism and Reaction. BROTHER CHRYSOSTOM.

The root principle of action, according to the Schoolmen, is act in the broadest meaning of that term, or form if we limit our investigation to the sensible world. All that an entity does is derived from its form and expresses that form. If the entity be inorganic, its reactions are manifested in various forms of motion, all of which lack spontaneity. In living organisms the various tendencies arising from either heredity or environment are all subject to an inner unifying control looking to the development of the individual or the species. In the theory of cognition the doctrine of reaction plays a conspicuous part. The living organism, being essentially though not exclusively material, is in so far passive and plastic, *i. e.*, receptive of outward influences; but when so impressed it reacts after the manner proper to its kind and in this very reaction performs the act of perception and becomes aware of something other than itself. The broad lines of this theory are the same for sensation and intellection, and consequently determine in great measure such reactions as outbursts of passion and deliberate exercise of will. Resolves, habits, virtue and vice, the scheme of education, and the plan of one's life are all inseparable from reactions, which are a condition of progress in the individual and the race.

A Criticism of Psycho-physical Parallelism as an Ontology. H. H. HORN.

Parallelism agrees with 'common sense' that both mind and matter are real; with 'conservation of physical energy' as usually interpreted that the soul is not a cause; with current biology that consciousness does not move the body; it has logical consistency and provides working theories on the origin of life and mind; it makes the microcosm analogous to the macrocosm, defends a world-soul or God, invalidates materialism, and is in so far idealistic that it asserts mind to be more valuable than matter. By way of criticism the following points are noted: It is too vague a system to satisfy any strict ontologist; in its dualistic ontological form the same objections apply to it as to any dualism or pluralism; it does not explain, but only formulates; it makes a very poor formulation of the facts of reality, for each process — physical and psychical — has one or more characteristics which exclude a strict parallelism in the other; its denial of the causal

relation between mind and body is in direct violation of Mill's method of determining causal connection by concomitant variations; no parallelist has been able as yet to show how the unity of human consciousness can have arisen out of the fusion of the psychic sides of atoms, or out of the 'mind-dust.' We conclude, therefore, that parallelism is not satisfactory as an ontology. The satisfactory ontology, when we get it, must be a unity, must be self-consistent, and must validate the experience we already possess.

The Affiliation of Philosophy and Psychology in Æsthetics.

ETHEL D. PUFFER.

The Quality of Psychical Dispositions. E. A. PACE.

The paper reviews the logical aspects of the theory of psychical dispositions under the following heads: The concept of dispositions, though derived from the physical order, is applied to mental life, while the substance idea, because of its origin, is rejected. Although the quality of psychical dispositions is said to be unknowable, they are postulated in explanation of certain essential features of consciousness. It is remarkable that mere dispositions, to which neither the character of substantial reality nor that of actual process can be ascribed, should exert so considerable an influence on the development and activity of mind. The theory of psychical dispositions is not strengthened by the assumption that these dispositions are psychophysical.

BOOKS RECEIVED FROM JANUARY 5 TO FEBRUARY 5.

Congress of Arts and Sciences, Universal Exposition, St. Louis, 1904. Edited by H. J. ROGERS. Vol. I. History and Plan. Philosophy and Mathematics. Boston and New York, Houghton, Mifflin & Co., 1905. Pp. ix + 626.

Sur la transmissibilité des caractères acquis. E. RIGNANO. Paris, Alcan, 1906. Pp. 320.

Le rêve: études et observations. M. FOUCAULT. Paris, Alcan, 1906. Pp. 301.

NOTES AND NEWS.

THE forty-ninth annual convention of the National Educational Association will be held at San Francisco, July 9 to 13. The Department of Superintendence of the Association will meet at Louisville, Ky., February 27 to March 1.

WE have received the first number of the *Zeitschrift für Aesthetik und allgemeine Kunstwissenschaft*, edited by M. Dessoir and published by F. Enke, Stuttgart.

PROFESSOR J. MARK BALDWIN has engaged to give a course of lectures on Genetic Logic in the University of Chicago, summer quarter, 1906 (first half).

THE following are taken from the press:

PROFESSOR WILLIAM JAMES, of Harvard University, is at present lecturing at Stanford University, where he will remain until June.

PROFESSOR EWALD HERING, of the University of Leipzig, has been made a corresponding member of the Academy of Sciences at St. Petersburg.

THE appearance of this issue of the BULLETIN has been delayed in order to include the Proceedings of the American Psychological Association. — ED.

DISCUSSION.

UNIFORMITY OF PAGE NUMBERING.

For long I have been troubled at times by discrepancies in pagination: not infrequently the numbering of reprints has begun with page 1, instead of with the consecutive page of the magazine in which the original appeared. To quote such a repaged reprint—*i. e.*, to use two ‘standards of reference’ for the same edition—results in confusion to the reader to whom only the original, which probably has the wider circulation, may be accessible. I have obviated the difficulty by translating the reprint paging into terms of the original; but this involves unnecessary labor and cannot always be done.

Psychological journals could well adopt the uniform policy of paging reprints *to correspond with the original*; paging is, anyhow, a mere device whose value depends upon its absolute accuracy. Changes that must be made in the reprint should go into appendices, to leave the pagination intact.

J. E. W. WALLIN.

PRINCETON UNIVERSITY.

(In the same connection practical experience in citation suggests the desirability of a simple division of subject matter in larger manuals. Ease of reference is much greater if the chapters run consecutively throughout the work, instead of depending on the subdivision into ‘Books,’ ‘Parts,’ etc. Volumes, also, are less liable to be confused in citation and practical use if numbered, than if distinguished merely by subtitles. The writer has found some difficulty in making lecture-room references to a recent valuable work for laboratory use, owing to the similarity in the subtitles of its several volumes. — H. C. W.)

THE
PSYCHOLOGICAL BULLETIN

RECENT STUDIES IN THE CORRELATION OF EYE
MOVEMENT AND VISUAL PERCEPTION.¹

BY RAYMOND DODGE,
Wesleyan University.

In two dissimilar lines of investigation the relation of the visual processes to eye movements has recently made notable advance. Both the Yale Psychological Studies² and the Psychology of Reading³ by W. F. Dearborn publish a mass of unusually interesting experimental data bristling with unexpected problems. Each attempts to interpret the data of eye movement with reference to the complex facts of perception of a particular group of phenomena, while the Yale Studies seek a generalized statement of the relation of movement to perception as such. In both investigations the experimental methods are so abundantly justified by the results, that the technique itself must be regarded as one of their important contributions. Indeed, in view of the wealth of unsuspected variations in movement, which these methods have disclosed, it is doubtful if any merely introspective analysis of fixation, muscular balance, and eye movement deserves serious consideration.

The main advantages of the photographic registration of eye movements consist in its objectivity, its simplicity and accuracy, and the absence of discomfort either during the process or later. Both its objectivity and its accuracy contrast sharply with the older after-image methods. If, for example, the problem were to determine the position of the fixation points in reading, the after-image method would be limited by the span of memory, while any after-image sufficiently

¹ This number, dealing especially with experimental topics, has been prepared under the editorial care of Professor Raymond Dodge.

² Vol. VII., No. 1, Monograph Supplements of the PSYCHOLOGICAL REVIEW.

³ Vol. XIII., No. 8, Columbia University Contributions to Philosophy and Psychology.

distinct to be serviceable would be a constant menace to clear vision, and its demands on the attention would more or less disturb the processes it was serving to investigate. This division of attention would be even more hazardous if the object fixated were a geometrical illusion. Similarly the invaluable method of direct observation is limited by the memory span of the observer, and is irregularly interrupted by the pursuit movements of the observing eye. Doubtless both the after-image method and the method of direct observation will continue to be useful, but they will serve us chiefly either in preliminary tests for the direction of more exact experiment, or in the specific application of established generalizations. Reasonable demands for safety and convenience preclude mechanical registration even if the effect of the abnormal muscular load could be disregarded. For the present at least some form of photographic registration must be relied on for knowledge of the facts of eye movement, and the present papers amply justify its use.

Each of the two publications describes its own variety of photographic registering apparatus, developed into a practical method. Since neither system is perfect in some more or less important details, and since the general procedure is suffering modification and refinement, it may not be out of place to indicate some of the main sources of error in the two types, and at the same time to point out the peculiar advantages of each.

Dearborn used the earlier and simpler method. He photographed the apparent movement of the reflection of a bright light from the eccentric surface of the cornea. As the image of this reflection fell on a moving plate he obtained directly a continuous curve of eye movement. But since one of the coördinates of the curve represents elapsed time, the other can adequately represent eye movement in only a single plane. In the case of reading movements that plane is naturally horizontal and the chief limitation of the method is comparatively insignificant. Nevertheless, even in the investigation of reading, it would be valuable to know the character and extent of the vertical excursions. Furthermore, one can never be sure that a comparatively small irregularity of the curve does not represent a considerable excursion in a plane removed from the horizontal. Dearborn is thoroughly alive to this limitation, but fortunately the main problems in the physiology of reading may abstract from the vertical movements altogether. On the other hand, as Judd rightly points out, a study of the complex eye movements involved in the perception of a geometrical illusion may not ignore movements of the eyes in any plane. Judd overcame the

limitation of the older method by taking a rapid succession of discrete photographs with a kinoscope camera. The position of the eye in each photograph may be determined by reference to points on a base line carried on a spectacle frame. It should be pointed out in passing that whenever worth while, Dearborn's apparatus could be adapted to measure the movements of the eyes equally in all planes if a base line were employed with intermittent illumination. Doubtless this modification of the apparatus will be adopted in future. Holt's use of the alternating current arc light suggests the simplest possible source of intermittent illumination. By this method each discrete record could be referred to its base line just as in the kinoscope records, while the falling plate apparatus has advantages of its own in matters of expense, simplicity of operation, rigidity, and in the perspicuity of its results.

The apparent movement of the corneal reflection was used by Dearborn as a measure of eye movement. The device has at least one obvious advantage: the subject is not emotionally disturbed by the introduction of foreign matter into the eye, and the method may be employed without special practice with children as well as with adults. Moreover, the photographic images of the corneal reflection are sharper and brighter than the images of any pigment thus far used. This means that for any required density of negative the illumination may be relatively less than is possible with pigments. The legitimacy of the method depends on certain precautions. The source of illumination and the camera should be placed symmetrically on either side of the object of regard, and the excursions of the eye should never be so great as to bring the corneal reflection off the relatively true optical surface found in normal eyes to cover more than half of the whole area of the cornea, approximately concentric with the visual axis. Anything more than this must be subjected to empirical calibration. These precautions Dearborn faithfully observes. Judd points out that every change in the axis of rotation of the eye must produce a corresponding change in the ratio between the apparent movement of the corneal reflection and the movement of a point across the retina. This is obviously true, but it is equally true of every photographic or other method of direct registration. The use of a pigment spot certainly does not obviate it. Probably the only absolutely safe method in this respect is the after-image method, but that is open to much graver errors. After all is said these possible sources of error are intrinsically small, and relative to the errors of measurement and the present profitable use of the data they are insignificant.

In several respects, however, I regard Judd's brilliant device for attaching an innocuous pigmented point to the cornea as a matter of the utmost importance to some forms of investigation. It permits the accurate measurement of longer eye movements than the corneal reflection permits, while for the shortest movements it gives photographic records approximately twice the amplitude of those from the corneal reflection. Finally the important, but thus far unfortunately ignored, element of torsion can be measured objectively, as far as I am aware, only by the pigment method.

The chief difficulty common to all objective methods is the interplay between head and eye movements. No practicable means has yet been discovered of holding the head absolutely quiet. Even the most elaborate combination of clamps and mouth plates holds the head only approximately rigid. Still more disquieting, since there is no obvious means of measuring them, are the effects of coördinate compensatory impulses. It has been demonstrated that accurately adjusted movements of the eyes accompany some specific movements of the head and trunk without measurable reaction time. Such eye movements are not dependent on actual head movements, but on the motor conditions which would lead to head movement. Consequently, even if the actual head movement is quite inhibited by mechanical means, while the eyes are still free to move, the involuntary and normally unconscious compensatory eye movements, coördinate with the mechanically inhibited head movement, may well appear as a real disturbance of fixation. There is some indirect evidence that they do.

The extent of actual head movement may be measured accurately by reference to a fixed base line independent of the head, and this precaution deserves place in all future records. The control used in the Yale Studies does not seem adequate to me on mathematical grounds. They relied on noting changes in the mutual relation of points on the base line attached to and moving with the head. But since these will change only as the sines of the angle of head movement, their increment may be considerably within the limits of measurement for angles of head movement which occasion entirely measurable compensatory eye movements. Suppose, for example, a total movement of the base line attached to the head of .5 mm. If the head be regarded as moving on an axis 150 mm. from the spectacle frame, the apparent relative change in the distance between two points, 25 mm. apart on the base line, will be roughly $150 (\sin 10^\circ - (\sin 10^\circ 12' - \sin 0^\circ 12')) = .0081$ mm. This is far below the limit of measurement in the Yale Studies, while the consequent total apparent displacement of

the eye is more than ten times the unit of reliable measurement. I think that the general importance of working with a control base line independent of the head is incontestable. Dearborn frankly leaves the entire responsibility for eliminating disturbing head movements to the rigidity of his head rest. While this probably leads to no large error in his conclusions, it has obviously handicapped him in the exploitation of his splendid collection of data.

A general résumé of the contents of the Yale Studies, published elsewhere in this number of the BULLETIN, permits me to restrict my discussion to a few special features.

McAllister's analysis of the process of fixation rests on data of unusual theoretical interest. Our traditional conception of the fixation of a point adjusts itself with difficulty to an involuntary wandering of the fixation point over an area whose diameter may be two degrees. Under such circumstances fixation is a misnomer. The functional center of the retina must be regarded as a variable whose mode of variation becomes a serious problem of physiological optics. Evidence of gross errors of coördination of the two eyes complicates the problem, but proves at the same time that the records cannot be referred to head movements, either actual or inhibited. Variations in the distribution of the errors occasioned by experimentally modifying the environment of the fixation point show a general correspondence to the character of the surrounding lines, but they throw comparatively little light on the character of the eye movements in viewing complex figures. McAllister's diagrams are cruel.

The records of eye movements across figures producing geometrical illusions present a mass of data complex, paradoxical, and altogether difficult of interpretation. The two eyes of the same observer never move in exactly the same way at the same time; while no two successive eye movements across a figure have more than a remote similarity. The records unequivocally justify Judd's negative conclusion, that the character of the illusion is not determined by sensations of eye movement either immediate or revived. Indeed, in view of the relative consistency of the illusion and of the extreme variation in the recorded eye movements, any attempt to correlate sensation and movement seems little short of hopeless. Judd's discussion of this general problem, under the title 'Movement and Consciousness,' is the soul of the series. The movement sensation hypothesis he definitely abandons, at least with respect to vision. On the other hand, the general relation between movement and attention, as well as certain specific typical differences in eye movements when

the illusion is marked and when it has disappeared, make it obvious that there is some sort of relationship between them. On general theoretical, as well as on experimental grounds, Judd finds a satisfactory explanation of their correlation by regarding movement as an expression of the interrelation between the various sensory factors. The central motor organization is not to be regarded as a factor in the sensory process but a bond of unity — a central mode of organization. Whatever sensory impulses can be brought into coördination and equilibrium by a simple act will be grouped together in space and time. An illusion is not due then to any sensory factors but to an illusory relation, and that relation is a central motor process.

Coördination of some kind between sensation and movement there surely is, but to make movement the sole coördinating fact of consciousness seems to the reviewer to go too far, unless, indeed, one goes still farther and regards all sensation as a form of movement, when the peculiar significance of the distinction would break down. There is indeed good evidence that a motor process does under some circumstances unite sensory factors into a whole. On the other hand it seems equally true that a presentational fact may be the bond of unity, coördinating numerous motor responses into a single act. Thus whether a broken sweep of the eye, with its half dozen constituent sweeps and corrective movements, is a single act or a number of acts, depends on some fact of organization outside the mere motor phenomena as such.

Dearborn's problems in the correlation of eye movements and perception are qualitative rather than quantitative and specific rather than general. While corroborating the general facts of the physiology of reading discovered by Prof. Erdmann and his collaborators, and independently by Huey at Clark, Dearborn found that the number of fixations per line of print varies with the ocular motor habits of the reader, but that in general short lines required relatively more fixations than long ones. Familiarity with the text tended not only to reduce the number of fixations but also to eliminate their irregularities. There was also a marked tendency in all reading which presented no particular difficulties to establish 'short-lived motor habits' with regard both to the number of fixations and to the inter-fixation movements. The influence of these habits was particularly apparent in the false movements, frequently found where the lines were of unequal length or were indented unequally. Moreover, the frequent refixations which occur during the reading of the first few lines of a passage seem to indicate a tardiness in the formation of such habits. In view of these

facts Dearborn points out with right that most primers and illustrated readers make early instruction in reading unnecessarily difficult by long and irregular lines.

More or less frequently interspersed in the regular alternation of fixation pauses and rapid eye movements, Dearborn found a slow drifting eye movement whose amplitude often exceeded two rapid movements and whose duration was from ten to twenty times that of rapid eye movements of similar amplitude. A slow movement of this kind uniformly took the place of a fixation pause between two rapid movements and apparently usurped its function as a moment of clear vision. Dearborn interprets these slow movements as an involuntary eye drift due to peripherally directed attention. They revived for him the discussion of the successive apprehension of printed words. Surely if they were unequivocal they would constitute the best experimental evidence at hand for the theory of Wundt and Zeitler. But, as Dearborn pointed out, they are far from being unequivocal. They occur from right to left as well as from left to right. Moreover, they are only occasional with any subject and they are rare with some. These facts suggest to the reviewer the possibility of a purely mechanical explanation. If they were to be regarded as evidence of the successive apprehension of a word, by the same token the more numerous real fixation pauses must indicate a totally different sort of process, while the retrograde movements would indicate the successive apprehension of a word backwards, a rather difficult process. Finally, tachistoscopic reading showed that whenever the slow movements did occur they were quite independent in time of the exposure of the word. The reviewer has described two types of eye movements which correspond closely with these slow movements both in velocity and in function. On the one hand they resemble compensatory eye movements and might arise as the accompaniment of incipient head movements which are mechanically restrained by the heavy head-rest. They also resemble the simple corrections of binocular incoördination. The only test for the latter would be binocular registration. A fair test for the former would be a few photographs without rigid head-rest, showing free head movements as well as the eye movements.

The duration of the fixation pauses varied widely with different individuals and with the same individual under different circumstances. While in general they were well above the recorded reaction time of the eye, some of them were materially shorter. The first fixations in each line averaged longer than any of the others for all subjects. Dearborn's hypothesis to account for this interesting fact is one of the

most important of recent contributions to the psychology of reading. He holds that the long initial fixation involves a general survey of the whole line and especially of that part of the line covered by the next two or three fixations which are regularly very short. This explains those fixations which are shorter than a normal reaction interval, as representing only a part of the true reaction interval. The question how much of the process of apprehension is subserved by this pre-fixational perception is theoretically and practically of the greatest importance. The large number of fixations necessary in reading a group of numerals contrasted significantly with the number of fixations in reading a line of words.

An analysis of the factors which determine the position of the point of regard at each fixation is the most difficult task of the monograph, and perhaps also the most important. Short connective and non-substantive words, prepositional phrases, and relative clauses are most consistently exacting. Familiar phrases and familiar words, however long, may be read from a single fixation. General training in reading and the arrangement of the matter read, as for example, the length of the line, the position of phrases within the line, the development of motor habits, and the attention of the reader to his work, all appeared to influence the points of fixation. Dearborn's practical and pedagogical suggestions are well within the limits of legitimate inference from his data.

PSYCHOLOGICAL LITERATURE.

EXPERIMENTAL PSYCHOLOGY.

Experimental Psychology. EDWARD BRADFORD TITCHENER. Vol. II., Quantitative Experiments. The Macmillan Company, New York, 1905. Part I., Student's Manual (\$1.50); Part II., Instructor's Manual (\$2.50).

These two Parts (separately bound) of Volume II. are the promised conclusion of Professor Titchener's manual of experimental psychology. Their appearance at length, even more than that of the foregoing two manuals of Qualitative Experiments, must highly gratify and encourage all English-speaking psychologists who look for an end to the present era of ill-considered and go-as-you-please experimentalizing. For it is to be admitted that psychology as a whole is looked at askance, and not without reason, by chemists and physicists; and that American, and such as there is of English psychology is too often merely an object of ridicule for exact scientists everywhere. It is not a pleasant thought, yet it is true that our psychological publications evince a general dissoluteness of thought, a lack of discipline, a disunitedness of purpose. Far too often we know neither why nor whither we are working. And while on the one hand we abound in experimental essays that are naïve and casual to the point of inanity, we balance this off, on the other hand, with a pretentious and futile pedantry; aimless investigations tricked out with an ignorant flourish of mathematics. Unpretentiousness, discipline, erudition, breadth, and logical pregnancy we sadly lack. Psychology at large seems scarcely to know its goal, but we in America have hardly any sound tradition or concertedness of purpose. We speak a language of which we have not yet mastered the grammar. Against all this a better counter-sway could scarcely be devised than Professor Titchener's present two volumes. They constitute the admirable and indispensable grammar.

If this work (the two Parts of the second volume) is a grammar, it follows that the student who works through this Manual is to gain merely discipline. Dry it will be pronounced by the student who wishes to pluck the fruit without having sown the seed. And it is to be admitted that the Manual does not disclose at every turn enticing vistas of research: the student will not be intoxicated with a desire to

pry further into the secret mechanism of mind and brain. For in this respect there is a subtle distinction between books — well illustrated, for example, by Nagel's *Handbuch* (volume three) where every page suggests some serious problem yet to be resolved, as compared with Schäfer's *Text-Book* (volume two) in which, excellent book though it is, the reader is less reminded of what remains to be discovered. Grammar, however, is confessedly a dry topic, albeit wholesome and necessary. And just as the text-book of grammar does properly not inspire the student to flights of eloquence, so, it seems to the reviewer, a drill-manual in psychology does well to make no concessions to inattention or listlessness on the part of the student. The phenomena themselves should inspire the enthusiasm for research and explanation. And the teacher who himself finds the *Manual* uninteresting, is exposed to a number of unfavorable comments: for the instructor's volume (Part II.) is a compact store of painstaking and minute historical exposition, and subtle and well-weighed criticism, of the methods of psychology.

A manual of 'quantitative' psychology must stand or fall on one issue — its answer to the question as to what the 'quantities' to be studied are. Are they psychical, or are they physical, or are they both? And if psychical, how are they to be defined? Here Professor Titchener has unquestionably, in the reviewer's opinion, taken the right point of view. Physical quantities are to be correlated with psychical quantities, and these latter are not sensations, but *sensation-differences* — the intervals or distances between sensations that form a linear series. The just-perceptible, or over-perceptible differences are the psychic quantities. The history and present state of this fundamental and much-disputed postulate are set forth in section 6 of the *Instructor's Manual*. The 'view of mental measurement as distance measurement,' adopted by Professor Titchener, is ascribed to J. R. L. Delbœuf; but it has also found advocates 'in one form or another, in whole or in part,' in 'Wundt, Boas, Stumpf, Ebbinghaus, James, Meinong, Höfler, Stout, and G. E. Müller.' Whether the word 'quantity' or 'magnitude' is allowed in psychology, or not, is of course a minor matter, and the history sufficiently shows that the disputes have chiefly centered around a word of which neither side had in mind an exact definition; 'commutative' and 'associative' laws are seemingly unfamiliar to psychologists. The vital point is that sensations form ordered series (pitches, color-shadings, et cet.), and that of any one element of such series consciousness can predicate 'Present' or 'Absent'; that of any two elements present, consciousness can predicate

'Same' (*i. e.*, =) or 'Different'; and that if any three (different) elements are present, consciousness can predicate of the two *differences* between them, 'Greater,' 'Same' (=), or 'Less.' It might be hoped that few psychologists would dispute this. Whether, now, such series of elements involve 'magnitude' is a question for mathematics: and it just happens that in mathematics they do involve magnitude. Oddly enough, Professor Titchener denies the final importance of the predicates 'greater' and 'less.' "The questions asked of consciousness are, in the last analysis, two only: 'Present or absent?' and 'Same or different?' For instance: Do you still hear a tone? or: Is this weight heavier [!] than this other, or lighter than it, or just as heavy?" Surely the answer 'heavier' or 'lighter' is an answer to neither of the questions 'Present or absent?' 'Same or different?' And in the reviewer's opinion the question 'Greater (*i. e.*, more) or less?' is not resolvable into the two others. Were the judgments 'More,' 'Equal,' and 'Less' impossible, either of the sensations themselves, or else of the intervals between them, the sensations would not constitute ordered series and would not involve magnitude.

The main body of the Manual consists of twenty-seven experiments distributed between sight, hearing, pressure sense, active muscle sense, simple and compound reactions, and time sense; and variously illustrating Weber's Law and all of the psycho-physic methods. It was necessary to make extensive use of mathematics, and in view of the various degrees of preparation met with in students of psychology this has been a delicate task: for "while the professor himself knows the value of the mathematical attitude for investigation, * * * he cannot say that the results of the application of mathematics to psychology are, at the present day, such as to warrant the exclusion of the non-mathematical student from his laboratory. It is, indeed, doubtful whether such exclusion will ever be warranted." The task has been admirably accomplished, and for the most part the mathematical procedures and formulæ involved are so clearly explained that any student of ordinary intelligence can easily understand them, even if he has studied no more than arithmetic and algebra. He is, moreover, led up gradually from the simple to the complex applications. In naming the psycho-physic methods Professor Titchener has departed from the traditional, mainly Wundtian, designations. The Method of Minimal Changes has become the Method of Limits ('Grenz-methode' of Kraepelin and Müller) because "it is better than the name 'minimal changes,' since it brings out the fact that the series stops short at a boundary, at the turning point of judgment." It may

be doubted whether the student will find this name as natural and significant as the old. Far better is the change from Method of Right and Wrong Cases to Method of Constant R. (Reiz). The true difficulty lies in the classification of the methods, and until that is adjusted no change of nomenclature will much avail. Thus the *Method of Equal Sense Distances* (*i. e.*, Method of Mean Gradations) turns out to be a *problem*, and the student is told (Part I., p. 82), "The most natural way, perhaps, is to apply to our present problem the principle of the method of limits." Equal sense distances are in fact a problem, and it is preserving an old equivocation to call that problem a method. Such equivocations abound in Wundt.

Some minor details call for comment. In the method of limits, the experimenter is told to stop at 'the turning point of judgment.' Thus in finding a difference-limen, when, say, the variable stimuli in ascending series are compared with a standard, the judgments on the former are 'less,' 'less,' et cet., until finally the judgment is given 'equal' or 'doubtful.' Here the comparisons stop; and a new series is commenced with the variable equal to the standard, and descending. Now it may be questioned whether the comparisons should stop until the variable is objectively equal to or even greater than, the standard; although then, certainly, the results are more complicated to evaluate. To be sure, Professor Titchener justifies his procedure very subtly (Part II., p. 109), and Wundt's precaution to increase the variable 'by a few more steps' beyond the turning-point of judgment, in order 'to be on the safe side,' simply makes the whole procedure inconsistent. Nevertheless the reviewer believes that there is empirical evidence to show that by the method here prescribed the difference-limen will vary appreciably (and directly) with the *size* of the steps arbitrarily chosen between the variable stimuli. The author's injunction that the steps must always be 'very small' will only partly reduce the error.

Under the Method of Constant Stimuli, the distribution of results is meant to be illustrated by a curve (Part I., p. 94) the relation of which to the results themselves, given on the previous page, can by no means be clear to the student; at least it is not clear to the reviewer. On page 107 similar data are illustrated by a similar curve. As a preface to the reaction experiments, there is a little treatise on the electric current with special reference to its use in the laboratory. This is for the most part clear and excellent, but it could be improved in places. Thus on page 129 (Part I.) the description of a shunt, although accurate, will certainly puzzle students: and from page 131 they will be likely to conclude that large incandescent lamps have

generally more resistance than small ones; on the following page it is stated of apparatus on a shunt that, "The closure of an apparatus circuit must always lessen the resistance of the lamp or strip with which it is in parallel, * * *" The author is generous and nice to a fault in giving credit for the lamp battery to A. Wright and E. W. Scripture: it is to be hoped that the patent rights on the introduction in psychology of simple devices long familiar in physics, will presently expire. Lastly, there are the inevitable typographical errors, very few in number, however, except in the German quotations; and nowhere important, unless it be in the substitution of 'rapidity' for 'slowness' (Part. I., p. 43), and the omission of an 'x' in the fifth equation on page 50.

The student who shall have worked through with care the experiments of this Manual will be indeed prepared to proceed to an original research in psychology. The work amply deserves to be adopted, for firstly, it is specifically planned to afford just that discipline that American psychology to-day lacks, and secondly, this plan is worked out to the last practical detail with remarkable skill and a prodigious amount of care. In conclusion it should be said that the Instructor's Manual will itself be invaluable to the psychologist, whether a teacher or not, by reason of some hundred compact and scholarly bibliographies, and some forty or fifty minute discussions of important psychological topics, which for their sheer erudition and general level-headedness and breadth of grasp can scarcely be surpassed.

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MONOGRAPHS.

Psychologische Studien. THEODOR LIPPS. (2te umgearb. u. erweit. Aufl.) Leipzig, 1905. Pp. 287.

The kind of psychology which Lipps always produces in his writings is one which is little cultivated in America. It is descriptive and systematic psychology of an extreme type. One cannot wholly refuse to overlook its references to empirical facts, for in all his writings Lipps has exhibited a wide acquaintance with the facts germane to his discussion. But the empirical facts are always marshaled around some central definition or theory. The theory or postulate is elevated to a position of such importance and its support seems to be a matter of such cardinal moment, that a kind of psychological dialectic results, which leaves on the reader the impression that the whole treatment is forced and formal. There is a certain strict logical co-

herency in such writing, but the price paid for this coherency is often high and the details of the discussion are devoted to defense of system rather than to statements of new and suggestive points of view. Take, for example, the second paper of the present series. The question is, how can musical harmony and dissonance be explained? The answer is that every musical tone has a characteristic which may be called 'tone rhythm.' This tone rhythm is a psychical quality dependent on the number of vibrations in the physical stimulus and the consequent capacity of the mental experience which is conditioned by this stimulus to form combinations with other tones. The evidence that every tone has tone rhythm is to be found in the fact that tones show the capacity for combination which is referred to in the definition, and consequently the capacity must exist unconsciously if not consciously and must be made the basis of any explanation of harmony. After stating this principle or definition, Lipps proceeds to the discussion of the theories of Helmholtz, Krueger, Stumpf and Wundt; and later, in applying the theory to melody, takes up the theory of Max Meyer. In his criticism of these other writers he has a distinct dialectic advantage. His tone rhythm is a flexible concept capable of including all that he discovers in combinations. Whenever he finds the particular writer whom he is criticising in any difficulty he offers his universal solvent, which is the more useful because it is a theoretical characteristic made to systematize the facts in hand.

Again, take the first paper of the present series. The first question here is how are the points in the field of vision arranged in a spacial order. The answer is that because the world is regular and orderly in its presentation we each develop an orderly form for the interpretation of experience. Eye movements do not explain this regularity, says Lipps, for they do not correspond in their characteristics to the regularity of the field of vision. The nativistic theory is inadequate because it leaves no room for the progressive development of experience in its adaptation to the regularity of presented experience. Disposing thus of theories which attempt to explain the facts, Lipps falls back on a theoretical relation which is less objectionable just because it does nothing but describe in a vague general way what seems to be clearly observed.

Another illustration of this type of psychology is found in the third discussion in the first paper. Visual depth is explained as the result of a recognition in experience of the fact that certain phases of experience do not belong in the flat extension of plane space. We get at times experience from the side of a house and again later we see

the front without being able to see the side. The side is, therefore, recognized as an experience differing in kind from that which we get from the flat front. This is sufficient cause for the rise in visual perception of the third dimension. Here again one is disposed to offer the comment that while the statement is undoubtedly true, it does not seem to advance the discussion.

The three studies which constitute the present volume are on the following subjects: Visual space, the nature of musical consonance and dissonance, the psychical law of relativity and Weber's Law. All are elaborations of principles familiar to readers of Lipps' writings and are for the most part polemical and discursive, as above described.

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Yale Psychological Studies, New Series, Vol. I., No. 1. Monograph Supplement, PSYCHOLOGICAL REVIEW, Vol. VII., No. 1, March, 1905. New York, Macmillan Co. Pp. 226.

'General Introduction to a Series of Studies of Eye Movements by Means of Kinetoscope Photographs,' Chas. H. Judd, Cloyd N. McAllister and W. M. Steele.

This paper describes a method used in the Yale Laboratory for recording eye movements. The difficulty which former investigators have had in getting a fixed spot on the eye, which will show in a photograph, has been overcome by the use of small pieces of Chinese white coated in paraffine. These are placed upon the cornea of the eye. Fixed points of reference are obtained by the use of wire spectacles supplied with steel beads upon the rims and worn by the subject to be photographed. Devices for keeping the head of the subject always in the same position and for controlling the light are also described in the paper. The camera used was the Edison kinetoscope camera, which is described. The reading of the records was effected by projecting the photographs by means of an ordinary electric lantern upon a sliding board covered with paper.

'The Fixation of Points in the Visual Field,' Cloyd N. McAllister.

The method above described was used to determine (1) how the eye behaves when an observer is consciously fixating a point; (2) how the eye moves from one point of fixation to another. In fixating a point it was found that the eye does not remain absolutely still but wanders around a small area in the region of the point. Lines in the neighborhood of the point of fixation modify in a definite and positive manner the character and size of the fixation area. Whether during

periods of fixation or movement along a line, the two eyes are not exactly coördinated in their movements. The eye usually moves along a straight line accurately the first time the movement is made and in any case does so after a few trials.

‘The Müller-Lyer Illusion,’ Chas. H. Judd.

‘The Poggendorff Illusion,’ E. H. Cameron and W. M. Steele.

‘The Zöllner Illusion,’ Chas. H. Judd and Henry C. Courten.

All three of the above papers describe methods for the quantitative determination of the illusions named in the titles. A continued series of determinations was made with each of these illusions and in each case the illusion tended to disappear with practice. Photographic records of eye movements made in looking at these illusions showed a significant relation in every case between the movement of the eyes and the nature of the illusion. There is a change in the character of the movement of the eyes, corresponding to the change in perception effected by practice.

‘Analysis of Reaction Movements,’ Chas. H. Judd, Cloyd N. McAllister and W. M. Steele.

A method is here described for the analysis of reaction movements. By means of a system of spring and lever attachments to the reaction key, which allowed a record of the movements of the hand of the reactor before the reaction was actually made, various types of reaction in different individuals and in the same individuals were discovered. It was shown that in no case is a reaction a simple process, but that it always consists of a complex movement bearing a determinate relation to the state of preparation in view of the warning signal.

‘Practice Without Knowledge of Results,’ Chas. H. Judd.

The experiments here reported were made for the purpose of showing the effect of acquiring new habits when the subject is ignorant of his habit and its effects. The subject was seated at a table and lines running at various angles, upward and downward, were placed at his left, so that he could see them. The part of the table at his right was protected from his gaze by means of a screen, and he was asked to make a dot on this side of the table corresponding to the projection of the line. In the first series of experiments this was done for each of the lines—nine times each day for ten days. The practice brought about little if any change in the amount of error in each case. Two lines only were then chosen with which to work—the one running upward at an angle of 60° and the other downward at an angle of 45° . In the case of the former, the subject was now allowed to pull aside the screen and see the paper on which the dot was to be located. The

screen was then replaced and the subject made five successive markings. He was then again allowed to remove the screen. Proceeding in this way a noticeable improvement was made, the error tending to disappear entirely. The error in the case of the second line, however, on which practice was carried on at the same time but without removal of the screen, tended to increase rather than decrease. The new habit tended also to increase the error in connection with the others of the original lines. Other variations were introduced which showed conclusively that an acquired habit is often misapplied in connection with related cases and is also often very difficult to break down.

‘Movement and Consciousness,’ Chas. H. Judd.

In the last paper of the series, which is theoretical, Professor Judd shows that all the other papers deal, in one way or another, with the same problem, viz., the relation between bodily movements and consciousness. Following the lines laid down by Münsterberg, and especially McDougall and Dewey, he seeks to apply the coördination theory to the results of the experiments recorded in the earlier papers. According to this theory, ‘the quale of any experience is equally determined by both the sensory and the response phases of a given coördination.’ In the reaction experiments, instead of speaking of a stimulus to react entering a subject’s consciousness and causing movement of a certain kind, we should speak of a certain state of preparation which is at once a state of sensory content and motor strain, which is changed into a new experience where both these factors are present. So, too, in the cases of the illusions — the false perception is not adequately described as dependent upon certain movement sensations, but it is a moving equilibrium, a disturbance of balance, in a process including both sensory and motor content.

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ILLUSIONS.

Zur Verständigung über die geometrisch-optischen Täuschungen.

THEODOR LIPPS. Zeitsch. f. Psychol. u. Physiol. der Sinn., 1905, XXXVIII, 241–258.

The author discusses the ‘consciousness of the size’ of an object when the latter is apprehended as a whole and as a unitary linear system; the nature of the apperceptive activity connected with its apprehension, both in respect to its character as ‘Einfühlung’ and as a simple expanding and contracting activity; the ways in which this contraction and expansion cause illusions, with particular application to the Müller-Lyer and the ‘vertical’ (again introducing the concept

of 'gravity' or 'weight') illusions. He concedes the justice of the criticisms urged against his resort to the 'unconscious,' criticises certain interpretations of his theory of *Einfühlung* (a word used in the sense of the Vischers), criticises the theory of motor impulses or eye movements, applies his theory to explain certain empirical results of Vittori, and the analogous tactual illusions of Pearce, and, finally, expresses the conviction that, while the theory may be lacking in detailed application, it will be found equal to all emergencies.

We may substitute the concept of quantity for that of size, since any perception of magnitude gives my activity of apprehension a quantitative determination — a definite 'quantity experience.' The quantity (loudness) of a tone resolves itself into its 'impression ability'; the quantity of an extent consists in that it has the ability to determine a definite *Weite* of my apprehension activity. The immediate impression of the magnitude of an object when considered as a *whole*, then, depends upon the intensity and range which it demands of my activity of apprehension. When this is demanded in too great a measure the object is too great for the immediate impression.

Now, there is no whole of extension not made such by my synthesizing activity, hence my apprehension activity is really an *apperceptive* activity; a certain magnitude of the latter enters as an integrating element and the extent of this is determined by the 'Blick des geistigen Auges.' The expansion and contraction of the activity of the latter are prerequisites to the perception of an extended whole.

This apperceptive activity, which is experienced simply as a spreading out and narrowing, is, however, executed upon the suggestion of the lines; it is a two-fold property of the lines and belongs to their 'Eigenart.' Contrariwise, these two activities — expansion and contraction — are a matter of apperceptive 'feeling-in'; they are 'felt-into' the lines so intimately that they are not immediately experienced as apperceptive activities but as activities of the objects themselves — whence we may not refer them to 'associations,' least of all to associations between spatial forms and representations of powers or activities.

How, then, does the illusion arise in the Müller-Lyer figure? The perception of the figure requires a thoroughgoing apperceptive activity, in order that the main line and the obliques shall be apprehended as a unitary linear system. The expansion activity of the main line, which stops at its end points, is expanded still farther when the obliques point outward, whence an overestimation. But when the obliques point inward the expanding activity is turned back upon

itself, in order that the obliques may be embraced in the unity of the figure, whence an underestimation. It is the apperceptive activity which goes outside the main line in both cases and unifies the figure. In the case of the vertical, which is complicated with a 'Natureinfühlung,' there is a tendency toward the diminution of the range of the 'inner regard.' But I must give my apperceptive activity a reach corresponding to the actual length of the line, in opposition to this tendency of contraction (gravity, the tendency *felt-into* an object, to diminish the distance between it and that which is under it), and to do this requires a more intense activity (than in the case of horizontals); whence the overestimation of the vertical. The activity is *felt-into* the line, and is therefore thought to exist in the line itself.

It is doubtful whether many investigators of illusions will be content with having the factor of eye movements or movement tendencies resolved into 'apperceptive' or 'apprehension' activities with which, by definition, they are connected. Experiments seem to show that the movements actually occur in many cases; even if they only rise to the order of reflexes they may contribute essential sensation data. The movements of the eyeball can scarcely be resolved into 'movements of the psychical eye' (whatever that may mean). And, while there may be doubts as to the function of eye movements, Lipps' theory, if valid, must account for a considerable array of empirical facts which seem to be better accounted for by appeal to various sensation factors; *e. g.*, differences between the retinal meridians, between the two eyes, between different positions, distances, fixations, obliquities of lines, illuminations, motions, physical contrivances used, regularity in the presentations, etc. The consideration of these and other equally important factors and details in itself throws grave doubt upon the value of the theory. This aside, there are illusions (*e. g.*, the reversible) to which the application of the basal tendencies involved could only be metaphorical.

In the opinion of the reviewer, therefore, while Lipps has done much in this article to remove some of the obscurities which surrounded his earlier formulation, the value of the theory of *Einfühlung* and apperceptive activities is æsthetic; it does indeed enunciate a truth of general psychological validity, but cannot give a specific and complete account of an illusory perception: perhaps not of a single case. At the same time it is judicious, in the face of recent empirical results, not to be overhasty in pronouncing the theory altogether sterile; the battle now seems to be drawn, not so much as between the recog-

nition of peripheral and central factors, but as between the primary and secondary rôle of each. The occasional emphasis which the author lays upon the need of regarding the objective figure itself and its details, and his final emphasis upon the two-fold nature of the factors involved in the perception, are features which especially commend themselves to the reviewer.

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Optical Illusions of Reversible Perspective: a Volume of Historical and Experimental Researches. J. E. WALLACE WALLIN. Princeton, N. J., published by the author, 1905. Pp. vi + 330.

The guiding principles for the historical portion of Dr. Wallin's book are set forth in words that may be quoted in illustration of the spirit, as well as of the literary style, of the volume. Usually, says our author, 'the rule is to select such material as offers palpable contrasts, as is deemed germane to a certain standpoint, or of far-reaching or essential importance.' Such a rule leads to 'all the imperfections attaching to the rehash: hyper-condensation of thought and exclusion of detail (albeit the statements are verbose), historical infidelity, non-genetic treatment.' Far from following such vicious ways as these, our author aims to give 'an exhaustive digest of all that has been said and done along the subjects treated, so far as the material has come to the attention of, or has been accessible to the writer in a somewhat extensive search in several libraries.' He "follows no abstract ideal of an 'ought' or 'should be' of selection, but attempts a faithful review of the 'has beens.'" 'Developmental stages in science'—and his book seems to have imitated their ways—'proceed in a blended zigzag, tortuous, helical, dragnet fashion.'

His attempt at "a faithful review of the 'has beens'" hardly brings results that will commend his method to many; the reader often tries in vain to get a clear idea of the contribution of some particular person, or of the connection of his work with that of others. The bibliographical references, however, will be helpful to one who wishes to review the field.

The experimental portion of the book is better, and in a number of particulars we have additions to our knowledge of perspective reversion. The more important points which the experiments bring out seem to be: that for very brief exposures there is generally a particular direction of perspective that is of more frequent occurrence; that the preliminary intention to see the one or the other relief does influence the direction of the perspective, without fully controlling it, and that

continued practice in attempts to influence the direction of the illusion by means of the will or the imagination increases the success of these efforts; that suggesting the one or the other form of perspective is of influence; that ocular fixation is important in determining the relief, although of no such decisive force as has been maintained; that a given perspective persists, on the average, for about three seconds, and that the average time of persistence differs slightly for the right and the left eye and for binocular regard. The rate of these perspective fluctuations would connect them more closely with those occurring in barely perceptible sensations, and would distinguish them from the periods found by experiments upon subjective rhythm.

As regards the cause of these changes of perspective, the author feels that the evidence is against a psychological explanation and in favor of a psychophysical. 'Psychophysical' appears to be interchangeable, in the author's mind, with 'physiological,' and in the end he lays considerable stress upon eye-movements and upon certain mysterious changes in the retina, that help to throw the perspective from one to another form. The theoretical discussion impresses one throughout as deficient in scientific nicety. On the whole, the book is an example of labor which is not without value, but which is in need of better intellectual guidance and skill.

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AFTER-IMAGES.

Bewegungsnachbild und Bewegungskontrast. A. v. SZILY.
Zeitsch. f. Psych. u. Phys. d. Sinn., 1905, XXXVIII., 81-154.

The author repeated all of the experiments which are usually made in investigating the phenomena of after-images of motion, varying the conditions of these experiments and carrying them into considerable detail. His general conclusions are, first, that the appearance of motion in the after-image following the perception of motion is due to a purely physiological after-image of motion, and second, that the seat of this physiological process is somewhere central to the retina.

In his first experiments he moved series of parallel lines across the field of vision, either by actually moving the objective figure or by turning the eye in pursuit of a fixation point which traveled across the parallel lines. The after-image appeared to move in a direction opposite to that of the primary motion. When the lines were oblique to the direction of motion, the movement in the after-image was in a direction opposite to the apparent motion of the lines — that is, per-

pendicular to them. A series of angles whose sides were parallel and whose vertices were in a straight line seemed to grow more obtuse or more acute in the after-image according as the eye moved into the angles or the opposite. He noticed in these experiments that the after-image was confined to that part of the field corresponding to the part of the retina stimulated and that its position was determined by the position of the eyes. In an experiment to obtain distraction of the attention from the primary motion he presented a series of numbers which changed at short intervals at the center or fixation area of a spiral disk and which furnished a new problem in addition at each change. Under these conditions the primary motion of the spiral was not consciously perceived, but the after-image was. This proved that the after-image of motion could be obtained without the conscious perception of the primary motion.

This group of experiments led the author to the conclusion that the appearance of motion in the after-image is a physiological rather than a psychical process; first, because the after-image may be produced by any movement of the objective field across the retina — that is, either by eye movement or by movement of the objective figure; second, because the after-image is in constant relation to the part of the retina stimulated, and third, because it may result from the stimulation of the retina without conscious perception.

In a second series of experiments the maximum speed of movement in the object which would be followed by an after-image of movement was reached in the case of the rotating disk when the outlines began to flicker, that is, at the upper threshold for the perception of primary motion, and similarly the lower threshold was found to be nearly the same as that for the perception of the primary motion. The author found also that a true after-image of motion was produced by appearances which do not result from a genuine motion in the primary field. Such appearances were given in the stroboscope and by two series of parallel lines moving at right angles to each other, which give the appearance of a diagonal movement. The author does not connect these facts with his general conclusion that the nature of the after-image of motion is purely physiological, and the question arises as to whether they do not suggest a coöperation of the psychical factor in the production of the after-image.

In a third series of experiments the author gave attention to a veil-like appearance which at times appeared over the primary field, moving in the same direction as the appearance of motion in the after-image. With a darkened projection ground the after-image took on a similar

appearance, though when the ground was lighted sufficiently to make its contours or pattern visible the veil disappeared and the pattern took on the motion of the after-image. This convinced the author that the phenomenon was a genuine after-image of motion.

In a series of experiments to determine the seat of the after-image he found that the perception of motion through one eye with the other eye closed produced an after-image when the first eye was closed and the second open. He also found that when two opposite movements were presented, one to each eye, the after-image obtained with both eyes open was confused, but that a clear image was obtained from each eye separately, corresponding in general to its presentation, but modified by the character of the presentation to the other eye. These evidences that the after-image from one eye was influenced by the presentation to the other one was held as justification for the hypothesis that the seat of the after-image was central to the retina.

In general conclusion the author says in regard to the phenomenon: "This is no illusion of the judgment; indeed, one may not even call the appearances sense illusion, for they are presented necessarily in qualitatively and quantitatively predeterminate form; they are under the same conditions always the same and they appear even when the objective excitation which produces them does not come to conscious perception. My researches have shown that this objective excitation is given every time the immediate impression of a regular movement has lasted a considerable time."

The article is prefaced by a full historical review of previous experiments and of the theories advanced in explanation of the phenomena.

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ATTENTION.

Aufmerksamkeit und Zeitverschiebung in der Auffassung disparater Sinnesreize. WILHELM PETERS. *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 1905, XXXIX, 401-428.

The object of Peters' experiments was to discover the effect of attention upon the time required to isolate the light-sound stimuli and incidentally harmonize the values found by Exner and Miss Hamlin.

With 'indifferent' attention to stimuli, values were obtained from three observers and used as the basis of comparison throughout. The sign + after the interval signifies that the light stimulus preceded by that amount in thousandth-seconds; the sign - that it followed. The limiting values were as follows:

'Earlier' I.	60 + to 35 +	'Later' 5 — to 40 —
II.	45 + to 25 +	35 — to 40 —
III.	80 + to 65 +	10 — to 30 —

Close attention was next given to the auditory stimulus with results as follows:

'Earlier' I.	95 + to 20 +	'Later' 25 — to 125 —
II.	20 +	25 —
III.	110 + to 105 +	10 — to 65 —

A comparison shows the 'earlier' limen to have been raised for I. and III. but lowered for II. The 'later' limen was raised for I. and III. but lowered for II. Close visual attention gave the following values:

'Earlier' I.	50 + to 30 +	'Later' 25 to 90 —
II.	10 + to 5 +	70
III.	45 + to 10 +	10 to 70 —

Changing the experimental conditions by using convex lenses which made the visual stimulus indistinct, and at the same time required visual attention, the results were as follows:

'Earlier' I.	50 + to 35 +	'Later' 25 — to 40 —
II.	15 + to 5 +	45 — to 55 —
III.	80 + to 70 +	20 — to 45 —

Under these conditions the values obtained for indifferent and auditory attention scarcely differed from those obtained under previous normal conditions.

The remainder of the experiments were made upon a single observer — the III. of those preceding. The intensity of the sound stimulus was reduced until it could be distinguished only by close attention, then the visual stimulus was treated in the same way. The values under the first condition were:

'Earlier' 130 + to 95 +	'Later' 10 + to 55 +
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Under the second,

'Earlier' 75 +	'Later' 40 —
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The time displacement of involuntary concentration of the attention was next taken up. Such attention was secured by signal stimuli of the same kind as that to which attention should be given, but on the whole he concluded that these signal stimuli were distracting. The first values are for sound signals, the second for light:

'Earlier' 75 + to 30 +	'Later' 10 — to 50 —
120 + to 80 +	25 — to 65 —

Instead of one pair of stimuli, as light-sound, a succession of light-sound stimuli were used. The values given are for (1) indifferent, (2) auditory, (3) optical, (4) optical with optical accommo-

ation, (5) indifferent with optical accommodation, (6) auditory signal stimuli, (7) optical signal stimuli.

'Earlier'	I. 100 + to 90 +	'Later'	30 — to 5 —
	II. 135 + to 125 +		100 + to 30 +
	III. 50 + to 40 +		85 — to 80 —
	IV. 105 + to 85 +		50 — to 45 —
	V. 75 +		35 — (?)
	VI. 85 + to 75 +		105 — to 5 —
	VII. 120 + to 100 +		45 — to 15 +

Finally, these results are brought into harmony with the Wundt-Külpe, and the Exner facilitation and restraint theory of attention by saying that these results show a 'natural' attention — an unconscious, individual preference for visual or auditory stimuli.

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Zur experimentellen Kritik der Theorie der Aufmerksamkeitschwankungen. BERTIL HAMMER. Zeitschr. f. Psychol., 1905, XXXVII, 363-376.

Die Aufmerksamkeitsschwankungen. C. E. SEASHORE. Ztschr. f. Psychol., 1905, XXXIX, 448-450.

Hammer holds that the so-called fluctuation of attention to visual intensity-differences is completely explained by retinal fatigue, and fixation changes which subject fresh retinal areas to stimulation. In an experiment he employed strips of gray paper laid in pairs on a gray screen, and found, in the one set of results given, that both phases of the period of fluctuation lengthened with increase in the difference between the two grays, and decreased with the continued repetition of the observation of a given difference. This result is supposed by Hammer to confirm his theory.

The theory involves the supposition that in auditory objects no fluctuations of attention occur. Hammer's second experiment showed accordingly that in the sound of a succession of strokes of an electric hammer, controlled by a metronome and supposed to strike uniformly, no fluctuation was observable. The alleged occurrence of auditory fluctuation reported by various experimenters is explained out of hand as due to faulty methods, presumably the use of unsteady sounds.

Seashore, in commenting on Hammer's article, says that the experiment on visual fluctuations brings out nothing which was not already well known. He criticises the report of the auditory experiment for omitting important information as to the rate of the metronome, the nearness of the sound to the threshold, and the duration of

the experiment. Assuming that the rate was near one per second, he would have predicted that no fluctuation would occur, since the attention wave would rise regularly to a crest with each stroke.

As an instance of faultless experimentation, in which fluctuation was clearly found, Seashore cites his own observation on fifty-five unsophisticated students, each of whom discovered the fluctuation in the sound of a chronometer beating fifth seconds, and in which results showed there was no considerable physical variation.

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FATIGUE.

Recherches sur la fatigue intellectuelle scolaire et la mesure qui peut en être faite au moyen de l'esthésiomètre. A. BINET. Année Psychologique, 1905, XI, 1-37.

This research concerning the effect of intellectual fatigue on sensibility was carried out by a commission appointed from the members of the 'Société libre pour l'étude de l'enfant.' The work consisted entirely of experiments on children in the primary schools of Paris.

The æsthesiometric method was used in all the experiments in which touch sensibility was tested. The back of the hand, screened from the view of the subject, was the part stimulated. In order to stimulate the skin by two points separated by a fixed distance, two needles were sunk into the edge of a card in such a way that the projecting ends of the needle could be lowered simultaneously upon the skin. There were seven such cards, the distances between the points being as follows: 0 cm., 0.5 cm., 1 cm., 1.5 cm., 2 cm., 2.5 cm., 3 cm.

The first tests were made on 45 boys and 38 girls from six to twelve years of age. The points were applied to the skin according to the method of maximum variation, that is, so that there would be the greatest possible contrast between the successive stimulations; 56 tests (*i. e.*, eight with each of the seven cards) were made before school in the morning; at the end of an hour of composition and arithmetic another similar series of tests was made.

As the average threshold for discrimination seemed to be about 1.5 cm. the conclusions concerning the effect of fatigue on touch discrimination were based on the relative number of right and wrong cases when the distances were 0.5 cm., 1.0 cm. or 1.5 cm. Out of the 840 tests on the boys recorded at these three distances there were 322 right judgments (two points). From the same number of tests

after fatigue there were only right 282 judgments, a decrease of 5 per cent. The decrease in the case of the girls was 11 per cent.

In the second experiment twenty boys and seventeen girls were tested in the morning before school work had begun and again after eight and one half or nine hours of intellectual work. A decrease of about 13 per cent. in the number of right cases was found for the boys and a decrease of about 14 per cent. for the girls.

A control was introduced in connection with this second experiment, to determine whether the loss of sensibility in the fatigue experiment could be due to loss of interest in the experiment. Tests were made on ten boys and ten girls on two successive mornings before their school work began. There was found to be practically no change in sensibility on the two occasions.

From these results Binet concludes that the decrease of sensibility is actually due to intellectual fatigue.

Binet's control experiment would seem open to criticism, since he has not simply reproduced the conditions of the other tests minus the fatigue factor. The first test of the second experiment was taken in the morning, the other eight and one half or nine hours later on the same day. The first test of the control was also taken in the morning, but the second was taken the next morning. Apart from fatigue there are several causes which might modify the discrimination sensibility, those causes, for instance, which appear in the work on fatigue by Kraepelin, Lindley and others (*Antrieb*, *Anregung*, physiological rhythms), etc.

The third experiment is the only one which was done under the direct supervision of Binet. This experiment, which was made on girls in the first class of the primary school, was very similar to the first except that only three stimuli were used, the distances between the pins being 0, 1, and 2 cm. The results showed again a decrease of sensibility.

Concerning the remainder of the paper, which takes up the question of the effect of fatigue on pain sensibility, little need be said, as the results are not conclusive.

The conclusions drawn from the entire work would seem to be that intellectual fatigue decreases touch sensibility and may perhaps have a similar effect on pain sensibility.

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VISION.

Ueber monoculares körperliches Sehen nebst Beschreibung eines als monoculares Stereoscop benutzten Stroboscopes. M. STRAUB. Zeitsch. f. Psychol. u. Phys. d. Sinn., 1904, XXXVI., 431-439.

Stereoscopic effects, Straub maintains, are to be accounted for in the same way, whether they are binocular or monocular. A physiological explanation is out of the question in the latter case, however, because the double images and disparate points fall on a single retina, and consequently monocular fusion must be attributed to a mental act of inference. But if the mind can translate parallax differences into depth difference in monocular vision there is no reason why it cannot do the same when the images fall on the two retinae and there is no use in seeking a physiological explanation.

The first point is that monocular stereoscopic effects can actually be obtained in the use of the ophthalmoscope. With sufficient practice depth differences in the background of the eye which can ordinarily only be inferred by the observation of parallax stand out in relief. If, then, this effect arises from the unconscious mental combination of successive parallax images, it ought to be seen when successive stereographs are viewed with one eye, and Straub finds that such is the case. He made sets of drawings for the stroboscope, such that two successive pictures made a pair of stereographs depicting a cube or other geometrical solid, and found that the monocular stereoscopic effect obtained was in no wise different from that obtained when the stereographs were observed in the usual way. By varying the conditions of this experiment and by further analyzing the appearance of relief which he observed with the ophthalmoscope, Straub was driven to the conclusion above stated, that in monocular vision parallax is actually translated by an unconscious mental process of fusion into a presentation in three dimensions. But when once the possibility of such a mental act has been admitted there is no way of escaping the further conclusion that stereoscopic effects in general may be explained on a purely psychological basis without taking any account of physiological theories.

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Vergleichende Bestimmungen der Peripheriewerte des trichromatischen und des deuteranopischen Auges. ROSWELL P. ANGIER. Zeitsch. f. Psychol. u. Physiol. d. Sinnesorgane, 1904, XXXVII., 401-413.

In view of the variation produced in 'periphery values' by a more or less complete adaptation to light, the experiments of v. Kries on

Professor Nagel are repeated during adaptation produced by gazing at white clouds with an artificially dilated pupil. Under these circumstances the 'periphery values' for the 'dichromatic' eye differed systematically from that of the normal eye — the brightest part of the spectrum lying decidedly toward the red. A similar displacement, though less accurately measurable, was observed in foveal vision of the 'dichromatic' eye.

Ueber Fixation in Dämmerungssehen. *RICHARD SIMON. Zeitsch.

f. Psychol. u. Physiol. d. Sinnesorgane, 1904, XXXVI., 186-193.

The position of Mariotte's blind spot and the apparent position of negative after-images are used to determine the position of the eye in 'fixating' faint stimuli in the dark. While the experimental methods preclude any great degree of accuracy, and the generalizations are derived from the experience of only one subject, the measurements are the best at hand and constitute a decidedly suggestive contribution. Simon finds no considerable eye movements during the extra-foveal 'fixation.' There is nothing approaching nystagmus. Approximately the same part of the retina functions as center under similar circumstances; but this part varies for different eyes and varies for the same eye, though in the same meridian, with the degree of dark adaptation and the amount of illumination.

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PSYCHOPHYSICAL METHOD.

Ein Beitrag über die sogenannten Vergleichen übermerklicher Empfindungsunterschiede. JOS. FRÖBES. Zeitsch. f. Psych. u. Phys. d. Sinnesorgane, 1904, XXXVI., 241-268; 344-380.

The specific point in this problem was to analyze the judgment actors in the perception of differences. The constant method, according to Müller, was followed to find a mean. Three weights, *A*, *B* and *C*, were placed before the observers, who were to compare the difference between *B* and *C* with the difference between *A* and *B*. There were two classes of results. In the first, being the results of a well trained observer, the differences were practically constant from day to day and approximately equal. In the second, the observers being not so well trained, the difference between *B* and *C* increased from day to day until the actual difference between *B* and *C* was about equal to the difference between *A* and *B*. As to the judgment factors, the introspections and special tests on two observers showed two main factors, namely, comparison and absolute impression. In one ob-

server the latter predominated, and in the other both were present.

By similar methods a series of experiments was made using gray discs instead of weights. Among the darker discs the apparent mean approaches the geometrical mean more closely than the arithmetical mean, while among the brighter discs the apparent mean is greater than the arithmetical mean. The authors ascribes this to the stronger tendency of the brighter discs to attract the attention and thus shift the apparent mean toward them.

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raphies of Philosophy and cognate subjects, compiled by B. RAND.
New York and London, Macmillans, 1905 (which should be 1906).
Pp. xxiv + 542, and 543-1192. \$10 net.

[The editor of these volumes wishes it known that he is not respon-
sible for errors in the portions of which he did not see proofs, including
the last 200 pages and the front matter, nor for the delays in their
appearance of over a year that was not at all necessary, the type-set-
ting having been 'held-up' for months by command of the pub-
lishers, with the 'copy' in the printing office, nor for the policy of
withholding 'review' copies, nor for the advance in price of these
and the other volumes to a figure prohibitive to many, a matter of
which he was not even informed. His suggestions as to the division
and sub-titles of the two parts of the volume were also ignored. One
of the errors of sufficient importance to note is on the title page: Dr.
Rand, the compiler of the bibliographies, has not been connected with
Harvard University for some time. Furthermore, the publishers,
besides printing a 'paying' edition, 2000 copies,¹ of the entire work,
have had *papier maché* plates made for reprinting and refuse to discuss
the subject of a revised edition. The editor has spent too much labor
on the work to consent to delegate entirely to the publishers its future
supervision and fortunes, and further plans will soon be announced.—
J. M. B.]

¹ Of which but 375 of Vol. I. and 544 of Vol. II. were left in May, 1905, ac-
cording to their report.

NOTES AND NEWS.

It is announced that with the beginning of the new volume (41) the *Zeitschrift f. Psychologie u. Physiologie d. Sinnesorgane* will be divided into separate issues, called respectively *Zeitschrift f. Psychologie* (to be edited by Ebbinghaus) and *Zeitschrift f. Sinnesphysiologie* (to be edited by Nagel). The Literature Section will not be divided, but will appear as a department of the *Zeitschrift für Psychologie* only, although covering the literature of 'Sinnesphysiologie' as well. Each of the two journals will be the customary size, and each will be sold separately (15 M. the volume). With the current number of the *Zeitschrift* appears the *Bibliographie* for the year 1904, just one year later than our own INDEX, in coöperation with which it is compiled. We congratulate the editors of the *Zeitschrift* upon the completion of forty valuable volumes. — ED.

PROFESSOR ROBERT FLINT has been appointed Gifford Lecturer for a two years' term at Edinburgh and Professor James Ward for a three years' term at St. Andrews. Philosophers are quite ready for further Gifford Lectures from Professor Ward.

A CALL has been issued for a 'Kongress für Kinderforschung und Jugendfürsorge,' to meet in Berlin early in October. All interested in the study, protection, and education of childhood and youth, whether physiologists, psychologists, biologists, or teachers, are invited to take part. While the congress is intended especially for German-speaking countries, the attendance and participation of foreigners is welcomed. A fee of 4 Marks is fixed for participants, in return for which the Proceedings will be sent when printed. A large committee of arrangements is named, the principal officers being Dr. W. Münch (Berlin) president, J. Trüper (Jena) vice-president, and Dr. W. Ament secretary; the address of the secretary is Sanderglaciisstrasse 44, Würzburg.

A PRELIMINARY circular has also been issued looking to the formation of an International Congress for Child Study to supplement the German and other national congresses.

PROFESSOR G. A. TAWNEY, of Beloit College, Wisconsin, is taking charge of Professor G. S. Fullerton's work at Columbia University during the latter's leave of absence covering the present semester.

THE PSYCHOLOGICAL BULLETIN

THE CHARACTER OF CONSCIOUSNESS.

BY PROFESSOR G. M. STRATTON,

Johns Hopkins University.

In a preceding paper I attempted to state in a general way the difference between mental and physical facts.¹ The topic with which the present paper is concerned is the relation of consciousness to this distinction. Over and above the two fields which we mark off as the psychic and the corporeal is there not something real to which we may give the name consciousness? The question would hardly have seemed pressing had it not been for the remarkable series of articles upon consciousness which have appeared of late in the *PSYCHOLOGICAL REVIEW* and in the *Journal of Philosophy, Psychology and Scientific Methods*.

But, perhaps first of all, one should provide against vagueness and a merely verbal discussion, by plunging into and through the purely verbal part of the matter. The word consciousness is famous for the variety of its meanings; Bain has given us no less than thirteen senses in which the word has been employed.² And since his writing, this number has been perceptibly increased. But out of all the conflict of usage there emerge two meanings that are so ingrained in our daily speech that it would seem to me necessary to accord them recognition; though it is to be hoped that, in the interest of clearness, one will drive the other from the field. These meanings we may call, respectively, that of James Mill and that of Sir William Hamilton. "It is easy," says the first of these writers,³ "to see what is the nature of the terms CONSCIOUS and CONSCIOUSNESS, and what is the marking function which they are destined to perform. It was of great importance, for the purpose of naming, that we should not only have names to distin-

¹ 'The Difference between the Mental and the Physical,' this journal, Vol. III, p. 1.

² Bain, *The Emotions and the Will*, 4th ed., pp. 539 ff.

³ James Mill, *Analysis of the Phenomena of the Human Mind*, 2d ed., Vol. I., p. 224.

guish the different classes of our feelings, but also a name applicable equally to all those classes. This purpose is answered by the concrete term Conscious; and the abstract of it Consciousness * * * that is to say, the words are *GENERICAL marks*, under which all the names of the subordinate classes of the feelings of a sentient creature are included." By 'feeling,' of course, Mill means any kind of mental process; so that his definition is practically the same as that given in Professor Baldwin's *Dictionary*, where consciousness is defined as "the distinctive character of whatever may be called mental life."

With this as our meaning of consciousness our problem would, in part at least, at once be solved; consciousness would be but the universal mark of psychic occurrences; it would be nothing above, or in addition to, them; it would be simply the peculiar mode of behavior which they all display and which distinguishes them from material things.

There would remain, however, the question whether, in addition to these two groups of occurrences—the mental and the physical—there were not experienced by us something that could not be called merely the 'distinctive character' or the 'generical mark' of either group; and this brings us to our second meaning of consciousness. "Consciousness," says Sir William Hamilton, in his *Lectures on Metaphysics*, "may be compared to an internal light, by means of which, and which alone, what passes in the mind is rendered visible."¹ The most general characteristic of consciousness, he tells us, is 'that it is the recognition by the thinking subject of its own acts or affections,'² — a statement hardly distinguishable from those to be found in Reid.³ But when directly criticising Reid, he expresses himself in other words. He believes in using the term consciousness 'as tantamount to immediate knowledge in general, whether of self or not'; it is now no longer mere introspection. "*Consciousness and immediate knowledge are thus universally convertible; and if there be an immediate knowledge of things external, there is consequently the consciousness of an outer world.*"⁴

With this latter meaning of the word, which is almost identical with its usage of late by Woodbridge⁵ and by James,⁶ the problem of

¹ *Lectures on Metaphysics*, London, 1859, Vol. I., p. 183.

² *Ibid.*, Vol. I., p. 201.

³ Cf. Hamilton's ed. of Reid, Vol. I., pp. 222 f.

⁴ Hamilton, *Discussions in Philosophy and Literature*, New York, 1868, p. 57.

⁵ Woodbridge, 'The Nature of Consciousness,' *Journal of Philos., Psychol. and Scient. Methods*, Vol. II., p. 119.

⁶ James, 'Does Consciousness Exist?', the same journal, Vol. I., p. 477.

the relation of consciousness to the psychical becomes live. I am not sure that either Woodbridge or James would, with Hamilton, require that the knowledge which we regard as consciousness should be 'immediate knowledge'; there is much in their papers to indicate that the distinction between immediate and mediated knowledge has for them no great importance. They are, however, clear upon the point that consciousness is merely a special type of relation — the cognitive relation, — and that, in some way, it is independent of the distinction between mental and physical things.

Professor Woodbridge has, with great clearness and force, set forth the view that consciousness is not at all defined by means of the distinction between 'the physical' and 'the psychical.' This differentiation, he tells us, "simply divides the field of consciousness into two parts, but does not isolate a separate field in which alone consciousness is found. Physical objects just as much as personal histories may be objects in consciousness. * * * The differentiation in question thus appears simply to reveal between our objects one of the distinctions of which we are conscious."¹ The world would thus appear to be composed of physical objects, mental objects and the conscious relation. Whether this would exhaust the whole, according to Dr. Woodbridge's judgment, I could not say.

We shall now have to consider the truth of such a view. Is consciousness to be set off in this way, as something outside the class of activities we regard as psychic? If one has to express objections to the doctrine just set forth, this must not conceal the honor due so lucid and keen a piece of work.

The motives for distinguishing consciousness, as the knowing function, from the field of mental occurrences generally is doubtless that to any experience whatsoever there is at least the possibility of adding another stratum, the *knowledge* of the experience. James Mill was accustomed to say that the difference between these two layers is merely a difference of words; to have a feeling and to be conscious of the feeling are but two names for the same thing. But such a doctrine is unpsychological in the extreme; for it is one thing to be envious of another, and quite another thing to know that you are envious; a young man in love is not necessarily a young man conscious of being in love. When we are *conscious* of our thoughts and feelings, we have set them out before us; we have made them objects, while behind and through them are still seen the original objects of our

¹ Woodbridge, 'The Nature of Consciousness,' *Journal of Philos., Psychol. and Scient. Methods*, Vol. II., 119; esp. p. 124.

regard; whereas until then, our only object was the person envied or beloved. When the experience is thus pushed off and reconstructed, the additional feature may be of the thinnest and simplest sort, as when we have but a vague awareness of some object hitherto unnoticed. Or it may be a thicker and more intricate layer, as when I actively scrutinize the object and make myself clear as to its definite texture and connections. But in any event we have here a peculiar addition to the original facts, and one which may come to them whether they be physical or psychic. It consequently seems to mark the presence of a function free from the limits of the purely psychic field, and therefore to be distinguished as a more general and more inclusive activity.

It would seem to me questionable, however, whether the knowing function is unique in this respect. It doubtless stands alone, inasmuch as no other of our mental operations has exactly this same office of *knowing* all things. But other functions are like the knowing function; for they, too, apply themselves to all things whatsoever, no matter to what group or class these belong. Feeling ranges up and down the world as unconfined as knowledge. It spreads itself like a haze over all that comes before us, over the physical and the mental alike. Just as I can know the house I live in, or know the judgment I have made; so, too, both house and judgment may be tinged with pleasure or with pain. And if it should be said that this pleasure can in turn be made an object of knowledge, so that knowing is the highest and all-including function, I see no hindrance to the reply that the act of knowing can, in its turn, be pleasant or unpleasant. So that knowing seems to reach no regions that are unattainable by feeling.

Nor does either of these activities have wider scope than will. Just as all objects indifferently may be known and may be objects of sentiment, so too they may be objects of volition. I may take up an active attitude toward the house, as toward the judgment. I may will to examine it or to alter it, just as I may will to make any conclusion I have reached an object of attention and of criticism. It would seem, then, that the volitional activity has a free course over the world, different in many ways from knowledge, but equally wide in sweep.

There is consequently a certain plexus of operations which can be imposed upon any object or system of objects. To the bare and neutral presence of the thing there may be added the experience that it is attended to, or is suffused with feeling, or is somehow involved in purpose. The readiness with which these additional layers may appear, their free occurrence with all manner of objects, and their

immense importance for us in every way, give us ample motives for selecting one or all of them for special intellectual honor. But since each is so important and they all are intimately conjoined, we should remember that if we select the knowing function and exclude the feelings and the will, it is *our doing* and does not signify that in the very nature of things knowledge has this superior rank.

Should we then say that all three are extra-psychical activities? Instead of merely one function that spans the distinction between body and mind and therefore refuses to be classed on the mental side, have we not three functions or at least a triple function that may not be regarded as a psychic power? That this would be embarrassing to psychology is perhaps no argument against such a withdrawal. The psychic realm is so largely made up of specialized forms of knowledge, feeling and volition, that if these were taken away it is doubtful whether anything would be left. The province would be not only without inhabitants but also without territory.

But for other reasons it seems to me that all these powers should be retained within the psychic group; and the main difficulty to their retention is removed when once we see that a part may here be greater than the whole. Knowing is but a part of our mental activity, yet it includes both mental and physical objects; it even includes itself. Feeling and will are each but a part; yet each extends over all things. But the way in which we regard knowing or feeling or volition, when we say that it is but a part, is not the same as when we say that it takes in all. When we say that it is limited and is but one among many, we are viewing it after the manner common in logical classification; we are intent upon the attributes it has and upon those it lacks. Knowing is rich in attributes; but something is absent from it, which at once stands forth when we look at will. We are therefore forced to say that knowing is but a specific kind of function, and is distinguished from many other kinds; it is but a part and not the whole.

But when we say that it includes all things, we are no longer intent upon its specific properties; we are looking at its range of operation, at the variety of things upon which it throws its light. In other fields the two points of view are easily kept distinct: space, as regards its properties, is limited and partial; it is logically outside the class we call physical bodies; yet it includes all physical bodies, since they exist in space. Time has but limited properties; it lacks many that space displays, many that motion displays; yet there is no space nor motion which is beyond the reach of time. So that there is nothing unique in the fact that consciousness, in the sense of knowing, is a

member of a special group of functions — belongs on the psychic side and not on the physical — and yet operates freely on both sides of the line.

There is, however, this farther peculiarity about the fundamental functions of the mind, namely, that they include themselves in their range of operation. I can know that I know, I can will to will, I can become sentimental and take a sad pleasure in my own distress. Self-knowledge is mysterious enough, we must all admit; but it is not a mystery essentially different from knowledge of a less reflective type. The direction the function takes, the special character of the items it works upon, does not fundamentally alter the nature of the function itself. To know remains essentially the same type of act whether the object known be a thing or a thought, be a spatial relation or a logical relation; as sight is essentially the same function whether we be looking at a scene without or looking at a reflection of the eye itself.

Moreover, this fact of self-consciousness will perhaps assist us properly to place consciousness in the world of objects known. The fact that consciousness can overspan the distinction between the mental and the physical has led to the conclusion (which, as I have said, seems to me mistaken) that consciousness is something to be classed as outside the psychic field. But since consciousness itself can be known, and can become an 'object,' though not a 'thing,' in consciousness, and can distinguish itself from other objects, — in view of this, should we not feel forced to say, if we consistently followed the direction which Professor Woodbridge takes, that consciousness itself was not at all defined by distinguishing between the conscious relation and the terms related in consciousness? "This differentiation," we might say, in words like his own, "simply divides the field of consciousness into two parts, but does not isolate a separate field in which alone consciousness is found. The conscious relation, quite as much as the terms related, may be an object in consciousness. The differentiation in question thus appears simply to reveal between our objects one of the distinctions of which we are conscious." But reasoning like this, which seemed almost unanswerable when confined to the distinction between mental and physical things, begins to seem no longer trustworthy when we carry it along this farther step. The fact that in consciousness we can surmount the distinction between the conscious and the unconscious does not persuade us that consciousness itself is still eluding us. On the contrary, it makes us more certain as to what consciousness is. It brings home to us in a way more forcible than

were otherwise possible that the knowing function can recognize its own qualitative limitations, can see that (so far as logical classification is concerned) it does not possess all properties and that its form of connection is different from various other forms; and yet in spite of this modesty in regard to its qualities, its function is seen to extend quite beyond the special class of 'objects' in which it puts itself. The situation is in some respects like that of a large mirror in a room, on the opposite wall of which there hangs another large mirror. Each mirror, while remaining but a part of the room and its furnishings, reflects the whole room, including itself,—includes the very mirror in whose surface the whole is reflected. The mirror takes in all, yet remains but a portion of the complex object it has before it. The universal scope of knowing, feeling and will — the fact that they can make even themselves their objects — seems to me no sufficient reason for denying them a place among psychic facts. Each has a limited mode of activity, while each has an unlimited field of action.

Two possible obscurities should perhaps be cleared up at this point. First, does not consciousness antedate the distinction between thought and thing? Are there not periods of what James calls 'pure experience,' in which the innocence of consciousness knows no such difference as that between mind and body? And would not this imply that consciousness is something superior to mental and physical alike? The answer seems to me to be that consciousness is independent of the *thought* of the difference between the two, but not independent of the *actual difference itself*. We need here to keep the genetic problem separate from the ontological. The child's earliest sensations are independent of his thought of sense-organs or of nerves; but not independent of sense-organs and nerves themselves. His perceptions of the outer world precede his power to distinguish between his sensations and his interpretive supplementing of these sensations; yet his perceptions do not precede the actual difference between these two factors in his inner life. As regards the contrast between physical and mental, we may say, therefore, that consciousness precedes the distinction but does not precede the difference. Ontologically the difference is there perpetually, and does not wait for us to become aware of it.

The other possible difficulty I would briefly refer to is this: if one were to say that the difference between mental and physical things consists in some difference in their mode of behavior (as I have said in my preceding paper) would not this be inconsistent with the view here taken that knowing and feeling and willing are to be classed as psychical in spite of their ranging, in their operations,

through all the physical realm? Only a word is needed to point out that *range* is by no means the only characteristic which an operation may reveal. As regards range, there is a certain similarity between thought and gravitation. But *laws* of thought are totally different from the *law* of gravitation. And this difference of their laws is but an expression of a difference in their modes of behavior. So that the distinction between the mental and the physical, which I proposed in my previous paper, is not at all contradicted by saying that some mental things in their operation spread over both mental and physical things.

In answer then to the question with which this paper began, I would say that there is something real to which we may give the name consciousness, but that it is not a reality which our distinction between physical and mental leaves out of account. It is either the 'generical mark' of all psychic processes, or else, in its other sense, it is a special one of these processes — the knowing function. But the knowing function, while singled out in this way for special honor, does not in the nature of things stand out alone. It is but an abstraction within a more complete process, in which emotion and will are found. These, too, conjoin objects into a relation which is quite as real and significant for us as is the knowledge relation. The continuum into which the mind builds its objects, as Professor James and Professor Woodbridge have helped us see, is marked by the fact that one object represents another, leads up to another and finds there its fulfillment. But this fulfillment is more rich and varied than a consideration of knowing would lead us to realize. An object may find itself fulfilled in a cognitive way; but it is equally true that an object may lead up to another and find, not a cognitive, but an emotional or a purposive fulfillment. There are many kinds of psychic continua; there are many kinds of transitions and fulfillments; and the knowledge relation is but one of the many psychic connections to which these terms apply. In applying the word 'consciousness' to the cognitive act, it should not be understood that knowing is the supreme function in the world of objects, or that it really breaks loose from those connections with feeling and will which modern psychology has recognized. But since the term 'consciousness' so readily suggests an independent function, and since it also so readily suggests something different from knowing, it would seem to me best for us to say 'knowledge' when we mean knowledge, and let the term 'consciousness' designate the common and generic features of our psychic acts, for which its historic breadth of usage so well adapts it.

PSYCHOLOGICAL PROGRESS IN 1905.

BY PROFESSOR EDWARD FRANKLIN BUCHNER.

University of Alabama.

If repeated search for a thing or relation may be taken to be some degree of proof of its existence, then the fact of psychological progress has been well attested during the elastic period under present consideration. The masters have been turning their unerring pens to the description of the science's past and to an invoice of its solvent assets. Baldwin's 'Sketch of the History of Psychology,'¹ Wundt's account of the development of modern psychology,² and Höffding's 'The Present State of Psychology and its Relations to Neighboring Sciences,' show how scientific history may contribute to a science itself. These are more than mere selective narratives; they are vigorous and independent interpretations of psychological principles. To Baldwin the history is clarified through identification with the genetic processes presented by self-consciousness in the individual. Wundt finds the unity in Hegelian philosophy to be the inspiring seed of the last century's developments. To Höffding, the analytic and the synthetic aspects of the mental life alike give the science a position in the circle of sciences as mediatory between the physical and the social extremes. These many-sided reviews of past efforts and present achievements are progressively helpful in securing solidity to the readjustments which characterize the present day.⁴ They bespeak the unity of the science; and historic progress must somehow show that said unity is more and more becoming actual in the teachings of science either individually or collectively.

Amid the shifting industry of many workers and the crossing lines of interests, it is not easy to determine the unquestionably greater tendencies which pull the lesser threads in their direction. The year we are called upon to sketch presents two features which are marked in spite of the infinite multiplicity of facts, theories and views. The

¹ Before the St. Louis Congress of Arts and Sciences, 1904, PSYCH. REVIEW, March-May, 1905.

² In *Die Philosophie im Beginn des zwanzigsten Jahrhunderts*, 1904. (*Festschrift* for Kuno Fischer, edited by Windelband.)

³ St. Louis Congress, PSYCH. REVIEW, March-May, 1905.

⁴ See 'Psychological Progress in 1904,' PSYCH. BULLETIN, March 15, 1905.

most interesting trait has been the continued effort to develop a more and more satisfactory *relational* theory of consciousness. This labor accredits its results to the standpoint of psychology as a science and to 'pragmatism' as a philosophical theory. Psychologists are beginning to feel the beneficial relief from the earlier traditional necessity of regarding consciousness as a 'thing,' a definite somewhat, offering itself as a scientific constant. Consciousness, many voices and more echoes are saying, is simply a relation or a number of relations *between* 'objects,' while objects are never *in* consciousness.

The other trait to be mentioned is progressive rather than reconstructive. It is the tendency to do, particularly in experimental matters, a small piece of work thoroughly and exhaustively. The methods of exact observation have sought to delimit the problems attacked, and insist upon being more critical of earlier pieces of work appearing from our laboratories. To be sure, there have been in the past repeated instances of a patient redoing of work, as in the measurement of reaction times, threshold determinations, etc.; but at present the reattacks are more genuinely entered upon with the avowed purpose of securing the maximum benefit from an impersonal mathematical method. This tendency rests upon two supports: the history of solutions for specific problems, and the disagreements among the experimenters. No more wholesome trait than this could appear, inasmuch as it is full of promise of future growth.

The most interesting feature in clearing up the physical conditions of consciousness to be mentioned is Flechsig's communication to the Leipzig Academy of Science.¹ This very sane comparison of the different neurological methods contributes much towards a settlement of 'the Flechsig question,' as it might be called, in the recent developments in this part of the psychological field. This paper goes far towards showing that science may be synthetic and constructive in spite of the opposition of personalities. It should interest psychologists that, in his St. Louis paper,² Donaldson points to the nervous system as constituting the source of the chief problems for investigation, inasmuch as it is 'the master system of the body,' in which sight of the constructive units is lost. So far forth one is, happily, relieved from the necessity of a decision whether the continuity or the contiguity theory of the neurone is the correct view. Basing his conclusion upon results

¹ 'Einige Bemerkungen über Untersuchungsmethoden der Grosshirnrinde, insbesondere des Menschen,' January, 1904. (See the *Johns Hopkins Hospital Bulletin*, February, 1905.)

² 'Problems in Human Anatomy,' *Science*, January 6, 1905.

obtained by Hitzig some five years ago, and more recent confirmatory results secured by Imamura, experimenting by methods of extirpation of the visual and motor fields, Exner formulates the view that the physiology of alternating hemiamblyopia depends upon the fibers of the corpus callosum, which furnish the necessary channels for the afferent currents from the side of the brain remaining intact.¹

During the same month in which Professor James advised us that consciousness does not exist, Professor Cattell maintained that consciousness is the most pervasive thing, appearing where and when least expected.² In the same breath he contended that psychology is not definable. The logical lack of determinability of the science, however, does not prevent there being 'psychologists.' Whatever these students study, *qua* psychologists, constitutes the field belonging to the science! The real interest in such an attitude is not in the challenge it presents to the definers and the determiners, but in its indication of the widening of the field of mental inquiry. Professor Cattell thus holds forth the promise of larger things for the future, and in so doing he but reaffirms the recurrent attitudes which during two decades have been clearing more ground for the advent of the psychologists.

Our year has been more quiet than its predecessor in regard to the general attitude that should be taken towards the science. That the scope and nature of psychology continue to be 'open' questions may be shown by such discussions as that presented by Miss Calkins.³ The treatment of the associational and the self-psychology leaves one with the query whether there might not after all be more than two points of view. Two new manuals by American psychologists show how the issues of standpoint and method determine the content and procedure of the science when it is to be taught.⁴ Interestingly enough, both may be regarded as the work of experimentalists; but each takes a different attitude towards the value of experimentation as a pedagogical means in psychology. Angell's book presents a marked divorce of actual testing from the older well-known and well-used methods of systematic exposition. Thorndike's book, on the other hand, is notable in following up the text with 'exercises' and 'experi-

¹ 'Zur Kenntniss des zentralen Sehaktes,' *Zeitsch. für Psych. u. Phys. d. Sinnesorg.*, 1904, pp. 194 ff.

² 'Conception and Methods of Psychology,' address before St. Louis Congress, *Popular Science Monthly*, 1904, p. 176.

³ *Der doppelte Standpunkt in der Psychologie*, 1905.

⁴ Angell's *Psychology: An Introductory Study of the Structure and Functions of Human Consciousness*, 1904. Thorndike's *Elements of Psychology*, 1905.

ments'; but these are not so treated as to class the work with the experimental manuals. The books agree in the determination to take the 'structural' and the 'functional' (Angell), the 'descriptive' and the 'dynamic' (Thorndike) sides of psychological problems. In maintaining a strongly flavored biological point of view, the outcome of both texts tends to regard consciousness as merely one among many manifestations of organic life.

That the psychological world is not at peace with itself on this question of method also appears from a contribution of Binet to individual and child psychology.¹ His study of young members of his family by a combination of 'tests' and introspection was primarily designed as a means of heralding 'a new movement' in method. This is to supersede the 'Wundtian epoch,' which has been physiological and statistical. In his reaction against persistent quantitative ideals, Binet demands that we pay attention to the individual traits of experimental subjects, and that study be made of the higher mental processes and not of the lower elements. Binet's position seems to be national. Shall France give us a new method of psychologizing? Toulouse, Vaschide and Pieron, in presenting the result of several years' work,² from their own point of view, consider only the technique of 'tests' by which the mental qualities of an individual are measured. Independently of practically all previous work done on 'tests,' they attempt to formulate a system of psychological tests which are to be standardized by pointing out the exactly reproducible conditions in measuring subjects. Neither of the above is to be compared with the permanent addition Titchener continues to make to the finished literature of experimentation as a definite and well-established mode of approach to psychological problems.³ That our methods are not determinately, and thus scholastically, fixed for a growing science, as psychology ought to be, is well indicated by the tentative adoption of several methods by Miss Martin,⁴ and by Professor Cattell's severely critical estimation of introspection in his St. Louis address, already referred to. The interest of the year, however, has not centered about this theme of perennial debate.

The best symptom of progress in the field open to experimentation is to be found in Professor Titchener's significant and timely St. Louis

¹ *L'étude expérimentale de l'intelligence*, 1903.

² *Technique de psychologie expérimentale (Examen des sujets)*; Toulouse's Bibliothèque internationale de psychologie expérimentale, 1904.

³ *Experimental Psychology: A Manual of Laboratory Practice*. Vol. II., Quantitative Experiments, 1905.

⁴ 'Psychology of Æsthetics,' etc., *Amer. Jour. of Psych.*, 1905, pp. 35 ff.

address, which became available near the beginning of the year.¹ Looking both backward and forward, this unusually excellent review of progress, trenchantly stated in terms of present experimental ignorance, will remain for some time to come an open guide in our laboratories. His earnest plea for a more thorough testing of available methods and renewed research over much of the old ground is already being realized. Three of the most interesting and contributory pieces of work to be noted acquired their merit of permanency by just such means. Wallin has done his work exhaustively, presenting historical and experimental results which can be finally accepted as he offers them.² While not fundamentally modifying the facts regarding such illusions, we can now at least feel certain about what we do know of the conditions controlling such perceptions. Baird has likewise, and in the same manner, made a distinct contribution to our knowledge of retinal color sensitivity.³ The experimental caution maintained after the preliminary historical summary of various inquiries into the color coefficients of the retinal zones, gives a feeling of acceptable certainty regarding the facts relating to the color modification of a constant stimulus by different sections of the retinal periphery and to the topography of the retina as fixed by the correct sensing of different colors. Perhaps the most interesting experimental material made available during the year, which also shows how psychologists should make repeated attacks upon the same problems, is offered by Judd, McAllister, and Steele, as reported in the new series of the *Yale Psychological Studies*.⁴ It presents eight studies centering around features of certain eye and hand movements. Great ingenuity and skillful device produced a new and accurate means of recording the complicated facts in eye movements by kinetoscopic photography and its application to a detailed study of the Müller-Lyer, Poggendorff, and Zöllner illusions respectively. This method, which makes a radical improvement over that of Stratton and Dodge, shows that the eye, instead of fixating a point, really fixates a small area, about which it wanders. The two eyes literally remain *two* in the process of fixation, inasmuch as they are not absolutely coördinate, except in the case of fixating a straight short line. In reëxamining the 'antagonistic'

¹ 'The Problems of Experimental Psychology,' *Science*, December 9, 1905, also *Amer. Jour. of Psych.*, 1905, pp. 208 ff.

² *Optical Illusions of Reversible Perspective, A Volume of Historical and Experimental Researches*, 1905.

³ *Color Sensitivity of the Peripheral Retina*, 1905 (a monograph published by the Carnegie Institution).

⁴ Issued as Monograph Supplement No. 29, *PSYCH. REVIEW*, 1905.

movements in ordinary reactions, discovered by Smith and studied previously by Moore, the same investigators discovered that reaction movements are really more varied in their composition than has been supposed hitherto, as is indicated by the types which may be classified as 'antagonistic,' 'wavy,' and 'balanced.' The relation of these newly discovered facts will probably modify some of the more prominent sensory-motor and action theories which have held the field for a decade or more. As in earlier years, problems of vision and visual movements continue to receive their ordinarily large amount of experimental attention.

There appears to be a partial subsidence of interest in the question of the nature of mental contents, and especially the primitive form of conscious experience. Such manifested interest as may be noted¹ tends to agree in the conclusion that primarily consciousness is of the nature of feeling. It would also seem that affection, the most neglected type of all experience, is coming in for a modicum of interest. The experimentalists are more and more critical of past results from laboratories, some of them going so far as to maintain that up to date we truly have no psychology of feeling. By way of strong contrast, the great formulators of leading positions are, interestingly enough, giving a larger sphere to feeling than ever before: so Hall in *Adolescence*, so Wundt in the final revision of his psychology has characteristically put feeling more nearly at the basis of his analysis of consciousness. Johnston has summarized the work done, and the views held in this field,² and Ribot has given a marked addition in the completion of his work on the psychology of feeling.³ His classification of feeling as 'passional,' 'unconscious' and 'justificative' is not in entire agreement with the functional point of view maintained in this work. A bit of adjustment has been undertaken by Geiger, who, in harmonizing the well-known positions of Lipps and of Wundt, demands that feelings be regarded both subjectively and objectively, in order that they may receive a treatment into elements and relations, much the same as sensations receive.⁴ Some new disposition of psychological content may be anticipated in the lately announced new work on genetic logic by Baldwin.

¹ Davies, 'An Analysis of Elementary Psychic Process,' *PSYCH. REVIEW*, March-May, 1905. Cf. also the views of Dr. Gordon in *Jour. of Phil., Psych. and Sci. Meth.*, Nov. 9 and 23, 1905.

² 'The Present State of the Psychology of Feeling,' *PSYCH. BULLETIN*, May 15, 1905.

³ *La Logique des Sentiments*, 1905.

⁴ 'Bemerkungen zur Psychologie der Gefühlselemente und Gefühlsverbindungen.' *Arch. für d. Gesamte Psych.*, 1904, IV., 233 ff.

Psychological æsthetics continues to show the tendency of constructive systematization. Volkelt, in following Lipps and Witasek with a massive volume,¹ presents the newer æsthetics, derived from the modern psychological methods. His aim is 'to unite the standpoint of modern psychology with that appreciation for the deeper significance of the æsthetic which characterized the school of speculative æsthetics at the beginning of the nineteenth century.' To do this he draws heavily upon art material and tends to reject the current doctrine of *Einfühlung*.

Vorbrodt, in giving the third² of the interesting series of essays begun in 1893 and not yet ended, continues to show that, inasmuch as religion deals primarily with a mental content, theology must undergo reconstruction at the hands of psychology. Theology, like pedagogy, is only applied psychology. How far this reconstruction and application should go before psychology has completed its treatment of this form of consciousness, may be judged from King's treatment,³ which ought to serve as the beginning of a more healthful movement in the treatment of these complex experiences called religious.

That social psychology may come to include sociology in so far as the careful analyses of individuals in social relations is concerned, is a position which seems to be gaining ground. Extremists, however, are sometimes instructive by way of showing how attitudes may come to be general. Thus according to Draghiscesco,⁴ individual consciousness originates in social consciousness, and the psychology of the individual must turn away from a biological explanation of his experience in terms of physical conditions. One would prefer to go to Ross's balanced scheme for tracing out the ramifications of psychological interests in the different fields of human life.⁵ A good illustration of basing social analyses on the import of psychological values is presented by Ghent,⁶ who interestingly traces the dominant economic character of society to mental development as the explanation of social changes. Small has given us a work⁷ which happily serves our science

¹ *System der Aesthetik*, Bd. I., 1905.

² *Beiträge zur religiösen Psychologie: Psychobiologie und Gefühl*, 1905.

³ *The Differentiation of the Religious Consciousness*, Mon. Suppl. No. 27, PSYCH. REV., 1905.

⁴ *Du rôle de l'individu dans le déterminisme social*, 1904.

⁵ 'The Present Problems of Social Psychology, *Amer. Jour. of Sociology*, January, 1905.

⁶ *Mass and Class: A Survey of Social Conditions*, 1905.

⁷ *General Sociology: An Exposition of the Main Developments in Sociological Theory from Spencer to Ratzenhofer*, 1905.

by showing the gradual historical process of the in-weaving of psychological standpoints and concepts into the scientific treatment of society.

By reason of the excellency of its records and experiments, and the remarkable character of the case reported, Sidis and Goodhart's volume¹ becomes a permanent contribution to our literature on the variations of personality. Franz's systematic review of the experimental work done on feeble-mindedness² prepares the way for future investigations in the psychology of the mental defectives and deficient. Psychiatrists are tending to show a greater reliance than formerly upon the value of exhaustive description and analysis of abnormal mental states for presenting the real problems of abnormal psychology, as indicated by several recent studies on association.

There is not space to touch upon the spirit of systematic reconstruction which is affecting philosophy as well as psychology, nor to point out the peculiar credits accruing to the latter from the various phases of the former as it is expressing itself in some of the notable works of the period given by Fullerton, Hyslop, Simmel, Santayana and others.

As a more quantitative way of indicating the bearings of the psychological interest upon the different fields, the following table, based upon the *Psychological Indexes* for 1903 and 1904, is very instructive. In spite of the increase of 62 per cent. in the entries for 1904 over those for 1903, five rubrics retain the rank they held a year ago.

1903		1904	
No. of Titles.	Rubric.	No. of Titles.	Rubric.
384	Higher manifestations of mind.	751	Sleep, trance and pathology.
373	Genetic, individual and social psychology.	541	Genetic, individual and social psychology.
377	Sensation.	539	Sensation.
271	Anatomy and physiology of the nervous system.	478	Higher manifestations of mind.
219	Sleep, trance and pathology.	362	Anatomy and physiology of the nervous system.
174	General.	269	General.
118	Cognition.	206	Conation and movement.
102	Conation and movement.	165	Cognition.
66	Characters of consciousness.	93	Characters of consciousness.
38	Affection.	41	Affection.
2,122		3,445	

¹ *Multiple Personality: An Experimental Investigation into the Nature of Human Individuality*, 1905.

² *Jour. of Phil., Psych. and Sci. Methods*, pp. 295 ff., 1905.

The year has also added new channels for the periodic and irregular publication of psychological material, two being in Italy. De Sarlo is directing the publication of the new *Ricerche di Psicologia* for the Istituto di Studi Superiori at Florence, and the *Rivista di Psicologia applicata alla Pedagogia ed alla Psicopatologia* is edited by Ferrari. Lipps has also begun his new series of *Psychologische Untersuchungen*. In America the recently published first number¹ in the *Archives of Philosophy, Psychology and Scientific Methods*² marks the completion of a unique plan of scientific publications, being under the editorial management of a single university, and providing for the issue of current articles, monographs, and books.

The associational interests of the science expressed themselves, in addition to the annual meetings of the several organizations centering about psychology, chiefly in the Fifth International Congress of Psychology, which was held in Rome, Italy, April 26-30. It might be questioned whether the results, so far as they have appeared, in the department of psychology at the St. Louis Congress of Arts and Sciences in 1904 realized the aims attempted. The geographical unity of time and space afforded the international speakers must not be mistaken for the inner and progressive unity of a science or of all the sciences taken in their totality. As for the psychologists, there was no marked agreement; each continued to speak then just as he had hitherto thought in his individual capacity. Such agreements as appeared along minor lines were notable for lack of accompanying projection of new fields for inquiry.

A few notable events touching the good and ill external fortunes of psychology came to pass. The international exchange of representative scholars between German and American universities well-nigh rings in the scientific millennium. For some time there has been a *cis*-Atlantic feeling that some few American institutions had finally advanced to the position where they could, with confident ability, offer advantages in some specialties of instruction and research not excelled by the justly famous institutions of the old world. This feeling has now been justified by the historic deeds which first established scientific comity in the interest of national development. This exchange of professors, while primarily affecting institutions as wholes, still augurs well for the future of psychology.

Leland Stanford Junior University marked the year by assigning to a psychologist, Professor James, the rare task of inaugurating a

¹ *Measurement of Twins*, by Edward L. Thorndike.

² Published by The Science Press, New York.

department of philosophy. The University of Liverpool began a lectureship in experimental psychology. Princeton University, while installing its novel tutorial system, credited psychology and philosophy with five preceptors. It remains for the future to assure us how much and what kind of new life this plan may bring into our scientific field. The dedication, on December 27, of Emerson Hall at Harvard University, indicates anew the friendly relations which psychology sustains to the other philosophical sciences which are there to be domiciled in peace under one roof. As soon as the *Biographical Directory of the American Men of Science*, compiled by one of our psychologists, Professor Cattell, and promised in the autumn of the year, appears, we may have a definite and new means of determining the proportion which psychologists bear to the researchers in other fields of science, since psychology is to be one of the twelve sciences listed in the directory.¹ The compilation may indeed well be interpreted as a means of gathering certain data available for psychology itself, namely, the psychology of the 'trained men of science' when constituting a distinct group in social organization. The final withdrawal of Professor Ladd from Yale University will not, every one hopes, mean the cessation of his constructive influence in scientific systematization, and in developing right attitudes towards psychology in the ultra-psychological world. The science sustained a great loss in the sudden death, June 15, of Dr. Carl Wernicke, who, through the approach of mental pathology, has made invaluable contributions towards the adequate interpretation of speech complexes.

¹ It has appeared since the manuscript of this article was sent to the printers.

PSYCHOLOGICAL LITERATURE.

PRAGMATISM.

Pragmatism v. Absolutism. R. T. ALFRED HOERNLÉ. *Mind*, 1905, XIV., Nos. 55 and 56.

In his discussion of Absolutism *versus* Pragmatism, the author fulfills in a most satisfactory way his avowed purpose of giving as impartially as possible the standpoint of each of these schools with regard to the problem of truth and knowledge. It is about this question that the contest between the rival theories centers. Mr. Bradley is taken as representing the position of absolutism most adequately. The most complete exposition of pragmatism is found in the writings of Mr. Schiller and Professor James.

The real importance of the contest is recognized only when it is seen as a new phase in that broader conflict between voluntarism and intellectualism which began in Germany in 1840. Pragmatism, indeed, represents the beginning in England of the revolt against 'the barrenness of the absolute,' the reaction from the reign of pure thought. In so far it is at one with the voluntarism of Schopenhauer, Sigwart and Paulsen. It differs from this earlier phase of voluntarism, however, in being less metaphysical and less strongly ethical. Its problem is the problem of knowledge, and its answer to the problem is to be found in the assertion that consciousness is essentially *one* in character, *purposive* in its nature, with conation, not cognition, as its most important feature.

Mr. Bradley's position with regard to the nature of reality and truth is summed up briefly in the following quotation: "I have assumed that the object of metaphysics is to find a general view which will *satisfy the intellect* and I have assumed that whatever succeeds in doing this is real and true and whatever fails is neither." The absolutistic theory of knowledge, as given by Mr. Bradley, is based upon the assumption that reality is a self-consistent, systematized, individual whole. Such a unified individual reality must be, otherwise it would be made up of a number of independent units, and plurality itself implies relationship in the form of coexistence. This fundamental proposition with regard to the nature of reality once accepted, all possibility of attaining the truth through knowledge is lost. Knowledge is

the purpose of thinking, to think is to judge, and to judge is to give to reality, to sentient experience, the subject of our judgment a thought content. Hence thought, since its function is to qualify reality, must deal with relations; its nature is adjectival. Thought can give us only the appearance of reality, never reality itself. Since reality is self-consistent, and qualification of reality is the purpose of thought, thought itself is valid in the degree to which it too is self-consistent or non-contradictory. The criterion for truth, then, according to Mr. Bradley, is *non-contradiction* or the *consistency of thought within itself*. It is obvious, therefore, that truth is a goal forever removed beyond the reach of thought's activity, that it is an ideal never to be attained. For a thought thoroughly self-consistent must have lost its relational character, must have destroyed itself as thought. Truth once achieved has ceased to be truth and has become reality.

Tested by the criterion of non-contradiction all of our most important concepts — time, space, causality, relation — are found to be unreal, mere appearances. Error, pain, evil, goodness, the long list of appearances that make up the sum of human experience, testify one and all to the limitation of the finite mind. An appearance as Mr. Bradley views it is a limited, inadequate, inconsistent aspect of reality. Appearances, however, differ in the degree of internal consistency which they possess. The reality of an appearance is proportionate to its inner self-consistency, and reality is nowhere found save in its appearances.

If thought is powerless to give us reality, feeling is not more successful. It surpasses thought in that it possesses that immediacy and self-subsistence of true reality which the duality of thought destroys, but it fails in that it points ever beyond itself for its explanation. The aim of thought is an experience which shall retain the character given to it by thought's analysis, and which shall yet possess the immediacy of feeling. Such a super-relational experience, in which feeling is satisfied and thinking absorbed, is found in the absolute. In this higher experience the contradictions, inconsistencies, mere appearances of our life are *somehow* merged, reconciled, transmuted.

At the end of this summing up Mr. Hoernlé makes several inquiries to the point. Because we are unable to prove that appearance is not *somehow* transmuted in the absolute, is it therefore certain that it *is* somehow transmuted? How can Mr. Bradley reconcile time and space as we know them with a timeless, spaceless experience? The analogy which Professor Royce draws for us between the 'Eternal Now' of the absolute and an infinitely extended human time span is unsatisfactory. For the human time span is simply the period between

two oscillations of attention. During this period attention is always focussed according to the interest on some particular impression for which the other impressions pouring in upon us form the background. But in the 'Now' of the absolute each detail stands out equally clear with all the others. It is impossible to make unchanging attention synonymous with experience of the unchanging. Nor does Professor A. E. Taylor's explanation of time and space as manifestations of the inner logical affinity of interest and purpose in the finite mind leave us much wiser as to why reality should reveal itself to us as time and space at all. Again, we may ask, if evil, pain and error are eliminated in the absolute, to what end are all our human efforts to remove them? If thought, if the thinker, if Mr. Bradley himself is but appearance, how can he get at reality at all? And yet it is only by first making an assumption about reality that he can prove that the facts of experience are mere appearances. So much for the difficulties of absolutism.

The pragmatist starts with the other end of the problem. Experience itself is the basis for his investigations. He aims to study the process of knowledge itself and to discover from it the conditions and reasons for those views of the world that we call real and true. So studied cognition is found to be essentially *purposive* in its nature. Thinking, like action, is for an end. The starting point for both is a situation which is disharmonious, the end of both is the solution of the problem, a satisfactory readjusted situation. Applying this doctrine of the purposive nature of thinking to the question of validity, the pragmatist rejects the statement of Mr. Bradley that a theory is true because it 'satisfies the intellect,' and presents the opposing doctrine that a theory is true 'because it *works*.' Just here Mr. Hoernlé points out the way by which these conflicting criteria may be reconciled. A theory is neither true because it works, nor does it work because it is true. The fact that it satisfies the intellect and that it works are complementary aspects of truth. The 'truth experience' is the end of a cognitive process, it is the solving of a doubt, the making satisfactory a concrete, disorganized situation. Truth has no determinate nature of its own, it is determined by our knowledge and is relative to the particular situation. There is no such thing as an eternally unchanging truth. The validity of a law is tested by its application in our experience. An axiom is a postulate so verified. All of the concepts, abstractions of science, need to be brought at frequent intervals before the bar of experience that judgment as to their value may be passed upon them.

Professor James's most important contribution to pragmatism has

been his arraignment of the abstraction necessity. Like the concept realism, determinism arose as the result of a world view which did not take into account man and his activity. It met the need man felt at certain times of knowing what results would follow certain natural processes, given certain definite conditions and leaving out of consideration all action on his part. It is misapplied when it is used to interpret the spiritual life of man. Indeed, when the moral consciousness of man is taken into account, it is found that mechanical processes are themselves modified and determined as instruments for the attainment of certain ends which man himself chooses from among many. In his choice of ends man makes the experience of the future, he himself creates reality. So we find a number of conflicting views of the world all equally justifiable, the logical, the æsthetic, the religious, the practical. The problem of harmonizing these is the problem which pragmatism leaves unsolved. The suggestion made by Mr. Schiller that all truth rests ultimately on an ethical basis and is dependent on social recognition leaves us unconvinced. Nor does it seem safe to leave the question of validity in the hands of the psychologist. Validity cannot exist apart from the cognitive process, each living thought may lay claim to truth. Psychology's method of retrospective self-observation, however, kills the thoughts and so destroys its validity. We must find our criterion for truth, Mr. Hoernlé maintains, apart from all individual subjective opinion in our common life, in our 'Arbeitswelt.' By this recognition of a broader experience within which our lives are but parts we retain the element of truth in absolutism and at the same time supply the standard for objective truth which pragmatism lacks.

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PSYCHOLOGICAL STANDPOINT.

Die Wege der Psychologie. THEODOR LIPPS. Arch. f. d. ges. Psychol., 1905, VI., 1-21.

There are three paths or kinds of psychology, Lipps here teaches. The first of them is that which all psychologists must follow, 'the path of description.' It is not a causal science, and its objects are the I-of-consciousness, the immediately experienced I, and the experiences of this I, namely, the sensational, emotional, and active contents of consciousness.

The second kind of psychology is named by Lipps pure psychology or pure science of mind (*Geisteswissenschaft*). From de-

scriptive psychology it is distinguished in that its object is the I-in-itself (p. 9); and also because descriptive psychology has to do with mere habits of consciousness, whereas this pure psychology concerns itself with the laws of consciousness (p. 8). These laws differ from the laws of pure natural science in that they are rational, not causal.

From this pure psychology Lipps distinguishes, in the third place, (p. 10) a causal psychology 'for which the individual consciousness is object of knowledge, not * * * this or that individual consciousness, but the individual consciousness in general (*überhaupt*).' Now the individual consciousness, Lipps says, is 'the consciousness which belongs to, or is possessed by, this or that individual' (p. 11). The individual is consequently "that to which a consciousness belongs, or that which has a consciousness. This, however," he continues, "is necessarily a something different from the consciousness. The individual * * * whose consciousness is, is neither a single event of consciousness (*Bewusstseinerlebnis*) nor a system of such events * * *, it is rather something real; it is a position in the ordered complex of the objectively real world (*eine Stelle im Zusammenhang der dinglich-realen Welt*)." The individual is, in sum, the soul or the real I of which the I-of-consciousness (*das Bewusstseinsich*) is the mere phenomenon (p. 12). This real I, Lipps goes on to say, is causally related with the objectively real world which surrounds it.

Closely similar to this causally explanatory psychology is psychophysiology, which arises from the empirical necessity of conceiving the life of consciousness as simultaneous with the system of brain processes. Psychophysiology, Lipps points out, presupposes both descriptive and causally explanatory psychology. "In so far as it is physiology," he says, "it is a special discipline of natural science. On the other hand, it is wholly dependent on psychology, * * * It is the physiological interpretation of a knowledge of psychology independently gained" (p. 18).

To the writer of this notice it seems futile to discuss from the standpoint of psychology the paper thus briefly outlined. Two of the paths which Lipps calls psychological are metaphysical windings. In plain English, what Lipps calls pure science of consciousness and what he names causally explanatory psychology are not psychology at all but philosophy of mind—bad philosophy at that, though this is not the place to discuss it. One regrets the more the pertinacity with which Lipps foists on psychology these metaphysical conceptions, since his descriptive psychology, left to itself, has such merit.

M. W. CALKINS.

J. G. Sulzer's Psychologie und die Anfänge der Dreivermögenslehre. DR. ANTON PALME.

This monograph will be of interest to the students of Kant as well as the students of psychology. It is an attempt to locate the sources of the now commonly accepted doctrines of the three-fold nature of mind. Sulzer's priority, according to the author, is based upon his analysis of the emotional processes. Aside from the main issue the discussion contains some material of interest to the historian of psychology, both as to terminology and doctrine. It was not Tetens or Mendelssohn, but Sulzer who gave to Kant the clue for his later and more developed formulation.

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ATTENTION.

Analyse de l'Attention. M. SÉROL. *Revue de Philos.*, 1905, VII., 597-620.

Attention as a state of tension is analyzed into its various aspects by M. Sérol, who, following M. Eggers in the general description, then proceeds most thoroughly and intensively to differentiate the various processes.

Tension is opposed to relaxation, and if we compare mental activity to a bow, a loosening of the string would represent repose and ease, and a tightening of the string intensity and concentration. In the latter state of affairs there is a fixation and intensification of the moment of consciousness concerned, in the higher stages, an end functioning for this purpose. There is fixation, reinforcement and suppression of distracting influences.

Following the discussion of M. Sérol, I give schematically the different aspects of attention as brought out by him :

ATTENTION.

Psychic elements. Form of attention.

DESCRIPTION.

External or sensorial. Object is external to the self and within control of the senses.

Internal or reflective. Object is not an impression of the senses, but a memory image or an abstract idea.

1. Psychological or subjective when it is turned towards affective states or voluntary acts.
2. Objective when it is turned toward cognitive states.
 - (a) Mnemonic or recall of past images or ideas.

- (b) Inventive or constructive when mental elaboration and noetic synthesis operate to form new images (constructive imagination), or new concepts (abstract or rational construction).

EXPLANATION.

Spontaneous, when instinct or acquired habit operates in the presence of a new situation.

Voluntary, when volitional determination operates after deliberation.

Motor elements. Matter of attention.

Motor inhibition.

Motor impulsion.

Psychic inhibition, due to motor innervation.

Psychic impulsion, due to motor innervation.

M. Sérol discusses the function of motor inhibition and impulsion first. As inhibition, the motor element shuts out all movements which may act as arresting agents, because of their uselessness in the process, and their unnecessary absorption of energy. 'In a word, it economizes, not by hoarding up energy, but by dispensing it usefully' (p. 599). It prevents energy from being dissipated in useless processes. As a facilitating agent motor impulsion furthers mental concentration and intensity. On the psychic side, motor inhibition operates by preventing any rival image or idea from developing a series *leading away from* the focus under control. Spontaneous and distracting associations are shut out. This elimination of distraction never reaches absolute monoideism, some marginal elements always being present. The positive function of motor innervation is, as in actual motor impulsion, to keep focal the situation concerned.

In objective attention there is a progressive enrichment of the concrete situation under control. In the beginning only a vague outline is present, of which the parts are more or less indistinct. Little by little, as long as the attention persists, more details of the situation become developed, greater distinctness is acquired, and all the aspects, visual, auditory, tactile, etc., tend to form a synthetic unity of greater complexity of parts, and increasing differentiation of qualities. During this process there is felt congestion, fatigue, and nervous or muscular strain. Any ideation masses or series are excited solely by the situation or object concerned, and rise spontaneously to reinforce the impression.

'In reflection, consciousness as it were turns back on itself to consider its actual or virtual content, that is to say, to revive previously existent states in as stable and intense a manner as possible' (p. 607).

The revived images or ideas are in this case under control of the reason. Of the kinds of objective reflection, we may have the concrete and imaginative or the abstract and rational. The former is concerned in recall, the latter in invention.

In recall we have the serial revival of a number of images directed towards some end which is to be revived and focalized. As M. Bergson¹ has shown, we have as a starting point a *general impression* which then becomes serially explicated. "Images, affective states, ideas, seem to be the usual content of this vague and weak conscious moment which we may call the *general impression*. * * * There then operates a tension on each of these imaginative, affective or ideal elements for the purpose of revival in the direction of the image to be recalled" (p. 609).

In invention we have a process of mental elaboration and noetic synthesis of elements previously existent and at present revived for the purpose of reaching some new combination. Two processes seem to be involved: (1) recall, and (2) reason and ideal construction. The revived states are focalized, and then explicated by a process of analysis for the purpose of ascertaining those elements which may be of service in functioning in the new complex to be formed. Mental synthesis then combines selected elements into new forms. Internal or reflective attention differs from external or sensorial in that, in the former, revived conscious moments predominate over the incoming impressions.

In voluntary attention the tension does not operate blindly, but it is directed to and guided by an end which functions in facilitating furthering elements and arresting hindering elements. The end is, of course, more or less known. *Ignoti nulla cupida*. Genetically we reach this state as follows: "In sensorial attention the process is most simple. Usually some object impresses itself strongly upon the senses of the subject who neither knows nor desires such object. This elementary impression is retained in the memory in the form of a memory image which sooner or later excites a desire for explicit knowledge. Then, after deliberation, the subject resolves to undertake the process of attention" (p. 616). This notion of end exists as a more or less general idea. 'Inner reflection fixates this end, intellect then finds the means necessary for its attainment' (617). Once the process is decided on, all motor innervations and inhibitions are directed to the end under guidance of those practical judgments which result from experience or rational induction.

¹ 'L'Effort intellectuel,' *Revue Philosophique*, 1902, p. 9. Bergson's expression is 'dynamic scheme.'

Even as briefly presented above, the discussion of M. Sérol is seen to be a very clean-cut presentation of the facts concerned in attention, and any additional comments on my part would be superfluous.

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SPACE PERCEPTION.

Malebranche's Theory of the Perception of Distance and Magnitude. NORMAN SMITH. Brit. Jour. of Psychol., 1905, I. (Pt. 3), 191-204.

According to Malebranche, distance-perception in vision is a 'natural judgment' based on the signs of convergence, accommodation, magnitude of image, brightness and definiteness of image, and number and kind of intervening objects. Magnitude-perception is conversely a 'natural judgment' based on distance actually perceived, but not on distance otherwise cognized. In this way the increase in size of the sun near the horizon is explained as due to the sensible apprehension of the intervening landscape.

These 'natural judgments' are not framed by the finite mind, but are framed by God on the occasion of the occurrence of the sign, so that our knowledge of distance from direct perception is as if we had reasoned it out from a complete knowledge of the details of nerve-process, bodily position, and geometrical optics. This is only one instance of the way in which our sensations are constantly interpreted by natural, involuntary judgments, which Malebranche calls also 'composite sensations.'

This theory, says Smith, is superior to Berkeley's in that it does not suppose an apprehension first of the sign and then of the distance by association or inference, a supposition unjustified by analysis of experience. On the contrary, the sign need not be perceived at all, but the concomitant of the brain state produced by it may be the apprehension of the distance alone. This ignoring of personal experience and activity in the building up of distance perception is on the other hand, however, a defect in Malebranche's theory as compared with Berkeley's.

The fundamental criticism passed upon Malebranche's theory is upon the confusion resulting from the recognition on the one hand of the intellectual element in perceptions, which leads him to call them 'natural judgments'; and his attempt on the other hand to reduce perceptions to mere sense agglomerates as regards the finite individual, with the intellectual elements entirely on the part of God.

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KNIGHT DUNLAP.

SYMBOLIC REASONING.

Symbolic Reasoning, I.-VII. HUGH MACCOLL. Mind, January, 1880; October, 1897; January, 1900; July, 1902; July, 1903; January, 1905; July, 1905.

Symbolic logic, including mathematics, Mr. MacColl defines as 'the science of reasoning by the aid of representative symbols; these symbols being employed as *synonymous substitutes for longer expressions that are required frequently*.' Of this definition he says: the words in italics contain the pith and principle of the whole subject.

In II. he justifies his choice of a certain symbol on the ground that it 'is easily formed, occupies but little space—two important considerations—and, though this is less important, because it is not unpleasing to the eye.'

In III. we find an illustration of his abbreviated symbolism. The 'symbol $A^{n^{ee}}$ ' may be read, 'It is certain that it is certain that it is false that it is impossible that A is true.' With this preliminary discussion of his system Mr. MacColl proceeds to apply it to the Aristotelian logic.

In V. Mr. MacColl, after noting that he has carefully examined the points in which his logic differs from or resembles other modern systems, referring in particular to Boole and Jevons, concludes that 'the former are slight and superficial, while the latter are serious and fundamental.'

Underlying the discussion of Syllogistic Validity, which forms section VII., is an assumption regarding *reality* which was attacked by Mr. Russell in a discussion of the preceding section. The topic there under consideration was 'the existential import of propositions' and Mr. Russell pointed out that Mr. MacColl assumes (p. 74) 'two universes, the one composed of existences, the other of non-existences,' and claimed that 'these two universes were not to be distinguished in symbolic logic.' Mr. MacColl, however, continues to make use of the distinction of 'real' and 'unreal' existences in the later section.

To those who have followed the recent discussions of 'reality' and 'existence' from the functional point of view, the problem offers little difficulty. If we set up two universes we have the problem of their unification and harmony. Cease to divide the universe and there is no problem. In fact, is not the asseveration of two universes a contradiction of the meaning of the term 'universe'?

Mr. MacColl, however, on the basis of this distinction, would commit us to an extension of our *Symbolic Universe*, or 'Universe of

Discourse,' so as to make it include not only the three syllogistic classes X , Y , Z , but also, what he calls their complementary classes, ' X ', ' Y ', ' Z '; "these being so related to the former that if we take any class X and its complement ' X ', the two are, on the one hand, mutually exclusive, and on the other, make up together the whole symbolic universe ' S .'"

The significance of this complementary class we learn from the preceding paper: there is the universe of *real existences*, denoted by e_1 , e_2 , e_3 , and the universe of *non-existences*, that is to say of unrealities, such as centaurs, nectar, ambrosia, fairies, with self-contradictions, such as *round squares*, *square circles*, *flat spheres*, etc., denoted by o_1 , o_2 , o_3 .

Mr. Russell, in discussing this dualism, does not deny its validity, nor raise the question as to how we come to make the distinction at all, but contents himself with ruling it out of logic and mathematics as being there irrelevant. He says: 'These words [round squares, centaurs, etc.] have a *meaning*, which can be found by looking them up in a classical dictionary; but they have not a *denotation*: there is no entity, real or imaginary, which they point out; * * * they are defining concepts without any entity to which the concept applies.'

But is this discussion and implied answer satisfactory? Evidently not, for Mr. MacColl rejoins: 'The crucial point which here separates me, I believe, from all other symbolists is that I regard the class o , whether empty or made up of unrealities, as necessarily *excluded* from *every real class*; whereas they all regard it as *contained in every class whether real or not*.'

Classes, for Mr. MacColl, are in reality three: those containing realities, the empty o class, and the o class made up of unrealities. The present reviewer is of the opinion that the real basis of Mr. MacColl's differentiation of the o class o_1 , o_2 , o_3 , is found in the unrecognized psychological necessity of attributing an existential content to this ' o class of unrealities. In so far as we have become cognizant of any slightest change in our motor disposition as the result of our cogitations upon centaurs, nectar, ambrosia, and the like, we do attribute to them a positive content, equivalent to reality and existence, and hence, psychologically, they have all the existential value for us that any object does. The nature of the distinction between the real and the unreal, the existent and non-existent, is functional. And this insight into the functional nature of all distinctions which the later philosophical discussions of reality have brought out seems to the present writer to clear up the crucial point of this logical discussion,

and to leave no place for the proposed extension of our logical machinery.

There are not two universes, whether we consider reality logically or psychologically. Once admit that the symbol *o* means *nothing* and we fail to see how 'unrealities' can be treated seriously as though they were *somewhat*.

Mr. MacColl's fallacy consists in setting up two *o* classes; the one empty, the other 'made up of unrealities.' The so-called unrealities, centaur, nectar, etc., are not to be classified with the contradictories, square-circle, and the like. The former, in so far as they are not 'empty,' are to be regarded as realities, while the latter belong, obviously, to the empty *o* class which the traditional logic recognizes.

ALBAN D. SORESENSEN.

CAMBRIDGE, MASS.

BOOKS RECEIVED FROM MARCH 5 TO APRIL 5.

Sociological Papers, Vol. II, 1905. Published for The Sociological Society. London and New York, Macmillans, 1906. Pp. xiii + 307.

Dynamic Factors in Education. M. V. O'SHEA. New York and London, Macmillans, 1905. Pp. xiii + 320.

Sex and Character. O. WEININGER. (Trans. fr. the 6th German ed.) London, Heineman; New York, Putnams, 1906. Pp. xxii + 356.

Experimentelle Beiträge zur Lehre vom Gedächtnis. A. POHLMANN. Berlin, Gerdes u. Hödel, 1906. Pp. 191. M. 3.

Kritik der Freiheitstheorien. J. MACH. Leipzig, Barth, 1906. Pp. viii + 287. M. 4.50.

La démenée. A. MARIE. (Bibl. Intern. de Psychol. Expér.) Paris, Doin, 1906. Pp. 492. Fr. 4.

L'attention. W. B. PILLSBURY. (Same series.) Paris, Doin, 1906. Pp. 305.

Gehirn und Seele. P. SCHULTZ. Ed. by H. BEYER. Leipzig, Barth, 1906. Pp. 189. M. 5.60.

Art et psychologie individuelle. L. ARRÉAT. Paris, Alcan, 1906. Pp. 159. Fr. 2.50.

- Beitrag zur vergleichenden Rassen-Psychologie.* A. PILCZ. Leipzig, Deuticke, 1906. Pp. iv + 44. M. 2.50.
- Nature et société.* S. JANKELEVITCH. Paris, Alcan, 1906. Pp. 188. Fr. 2.50.
- La philosophie de la longévité.* J. FINOT. (11^e éd.) Paris, Alcan, 1906. Pp. v + 358.
- Causeries psychologiques. 2e Sér.* J. J. VAN BIERVLIET. Gand, Siffer; Paris, Alcan, 1906. Pp. 165. [Four collected papers.]
- The Life of Reason.* Vol. V. *Reason in Science.* New York, Scribners, 1906. Pp. ix + 320. \$1.25 net.

NOTES AND NEWS.

IN the Yale department of philosophy, R. P. Angier, Ph.D. (Harvard), at present assistant in the Berlin laboratory with Professor Nagel, has been appointed instructor in psychology. Mr. E. H. Cameron, M.A. (Yale), at present fellow in psychology and philosophy at Yale, has also been appointed instructor in psychology. Courses will be given during the coming year by Professor G. H. Palmer, of Harvard, and by Mr. H. R. Marshall. Professor Palmer will give a graduate seminary in Ethics, meeting the class every week. Mr. Marshall will give each week two courses, one in *Æsthetics* and one in *Psychological Theory*.

A SPECIAL alcove has been set aside in the Philosophical Library of the Johns Hopkins University to be called the 'Royce Collection of Philosophical Americana.' The alcove is endowed by a fund donated by Professor Josiah Royce, of Harvard University. It will comprise especially works, editions, MSS., etc., illustrating the sources and progress of philosophy in America.

DR. JAMES BURT MINER, assistant professor of philosophy at the University of Iowa, has been appointed assistant professor of psychology at the University of Minnesota, to succeed Dr. G. H. Johnston, who resigned last summer. He will begin work there next autumn.

WE learn that Dr. W. B. Smith, of the chair of mathematics at Tulane University, has been appointed professor of philosophy in that institution.

THE annual spring meeting of experimental psychologists will be held at New Haven on April 18 and 19, at the Yale Laboratory.

THE sixth annual meeting of the Western Philosophical Association was announced for April 13 and 14 at the University of Wisconsin, Madison, to be held in conjunction with the meeting of the North-Central Section of the American Psychological Association.

WE have received the first number of the *Journal of Abnormal Psychology*, edited by Dr. Morton Prince (458 Beacon St., Boston) with the assistance of an editorial board (bimonthly, beginning April, 1906; Boston, Mass., Old Corner Bookstore, \$3).

ANOTHER new serial publication is the *Klinik für psychische und nervöse Krankheiten*, announced by Carl Marhold (Halle), to be devoted to the quarterly publication for two years of matter from the clinic of Professor R. Sommer of Giessen (M. 3 the number).

DR. TOULOUSE, editor of the excellent *Bibliothèque internationale de Psychologie expérimentale*, announces through the same publisher (M. Octave Doin, Paris) a *Bibliothèque Biologique et Sociologique de la Femme*, 'a résumé of knowledge of the biology, anthropology, psychology, pathology, pedagogy, and sociology of woman,' to be written by a body of distinguished authorities (15 vols., 4 fr. each).

THE Danish Royal Academy of Science and Letters announces a prize competition on the following topic: 'To examine, from the point of view of the theory of knowledge and from the point of view of psychology, the relation between Criticism and Pragmatism.' The competing essays must be ready by October 31, 1907; a gold medal will be awarded as first prize. For particulars address Professor H. G. Zeuthen (Secretary of the Academy), at the University of Copenhagen.

PROFESSOR M. V. O'SHEA, of the department of education in the University of Wisconsin, has been granted eight months' leave of absence, which he will devote to the study of contemporary European education. He will spend some time at the universities of Paris, Berlin, and Oxford. While abroad he will deliver a number of lectures on contemporary educational ideals and practice.

THE following items are taken from the press:

DR. F. KRUEGER, docent in philosophy at Leipzig and assistant in Professor Wundt's laboratory, has accepted a call to a chair of philosophy in Buenos Ayres.

DR. RALPH BARTON PERRY, assistant professor of philosophy at Harvard University, has declined a call to a chair of philosophy at Leland Stanford University.

PROFESSOR GEORGE H. HOWISON, of the University of California, will give a course of lectures at Yale University on 'The Human Import of Philosophy.'

THE PSYCHOLOGICAL BULLETIN

THE NEED OF AN EXPERIMENTAL STATION FOR THE STUDY OF CERTAIN PROBLEMS IN ANIMAL BEHAVIOR.¹

BY JOHN B. WATSON,
University of Chicago.

Two great classes of investigations in comparative psychology await an experimental station for their complete solution.

Class I. Investigations requiring continuity. (*A*) Those types of investigations requiring the observation of many generations of a given species. (*B*) Those requiring the continuous observation of an animal from birth to old age.

Class II. Investigations requiring a larger environment than that afforded in universities located in cities.

Let us consider a few specific, typical problems in each class.

DEVELOPMENTAL PHENOMENA WITHIN A PARTICULAR SPECIES.

Thorndike in his book on 'Educational Psychology' stated a problem which many of us interested in both human and animal psychology would like to see settled. It concerns the old, vexed question as to whether a particular type of behavior, acquired during the lifetime of an individual of a given species, will be present in the offspring of that individual.

Thorndike's words are as follows (p. 63): "The obvious way to settle our question [as to whether mental traits are inherited] is not by contemplating these inferences from present knowledge of the process of development, but rather by making the crucial experiment of letting animals acquire some mental traits and observing the nature of the offspring. No such experiments of a decisive nature have been made. If for generation after generation mice were offered palatable

¹ This number, dealing especially with topics in comparative psychology, has been prepared under the editorial care of Dr. John B. Watson.

food always in the shape of yellow cubes smelling of grease, and unpalatable food always in the shape of white balls smelling of cheese, were kept in a cage so arranged that on going into a certain alley they always received an electric shock, and were otherwise given a chance to learn certain habits, an observer could measure for generation after generation the quickness of formation of these habits and detect the slightest improvement. Ten or twenty generations would thus give a final answer to an ancient quarrel."

While the difficulties in working out this problem would be many, they are not insuperable. In the white rat we have an alert, intelligent and active animal—an animal which exists only in captivity, in consequence of which experimental conditions impose little hardship upon it. The animal breeds all the year round and its period of gestation is only 21 days. The white rat begins to acquire habits early and under experimental conditions can master ten to fifteen 'problems' before it is 30 days of age. Again, the white rat is sexually mature at 60-70 days. This makes it possible for us to have a new generation every 80-90 days.¹ In five years, barring accidents, we should have an unbroken succession of 20 generations of a rat family.

We would suggest that this problem could be attacked *at an experimental station* in a little more elaborate way than that suggested above by Thorndike. Let us suppose, first, that we have at our experimental station a series of twenty-five standard problems, varying in complexity; secondly, that we have an unvarying routine in teaching the first animals these problems; thirdly, that we keep a complete set of records of the time, errors, etc., made in learning these problems. Let us start our experiment by presenting, in a fixed order, these twenty-five problems to ten rats, five males and five females—all from different families. These ten rats could master these problems by the time they were seventy days of age. They would then be allowed to breed. A selection of the young would follow. Those selected would be taught the problems under the same iron-clad routine that their parents had to follow—the number of young selected would be determined by the natural limits of the investigator's time. This same routine could be followed, year after year, until the behavior record of 'Smith White,' the twentieth, showed a marked superiority over that of 'Smith

¹ It might be objected here that the animals at the age of 70 days are too young for the acquired type of behavior to have had its full effect upon the germinal cells (?) of the organism. This objection could be met by restraining the animals from breeding until they were, say, 140-150 days of age. This would have the effect of approximately doubling the time necessary for the investigation.

White,' the first, or until the investigator might be convinced that tuition from generation to generation has no effect.

Along with this broader and more detailed treatment of the problem, some such minor investigation as is suggested by Thorndike with reference to the food of the rats, might be carried out.

In conducting this investigation as we have just indicated we would in the end have data upon both males and females in learning those standard problems. Differences between the sexes in their ability to inherit 'mental traits' would thus be detected if such exist.

DEVELOPMENTAL PHENOMENA IN THE LIFE OF AN INDIVIDUAL.

Only those who have attempted to study seriously some phase of mammalian behavior can appreciate the enormous amount of time it requires. The reactions are so complex and the results have to be presented in such large numbers that one burdened with instructional work hesitates to start a new problem. Then, too, there is no doubt in our mind that the published results of behavior tests would be more complimentary to the animals were we in a position to devote more continuous time to them and to watch and to control their early development.

A glance at the bibliography of comparative psychology for the past two years will show that we have ten studies on the behavior of lower organisms to one on mammals. The reason is not far to seek if we consider the comparatively small amount of care and expense the lower organisms require. A jar of water and a wisp of hay suffice to give paramecium a suitable habitation. But a mammal, even so low in the scale as the rat, must have intelligent care.

But let us mention some of the specific types of investigations to be considered under Class I., *B*.

The effect of continued tuition upon the behavior of the individual of a given species is a general problem which must be solved before we are upon firm ground in our interpretations of specific results. Let us consider the rat again. Suppose that in this connection instead of 25 standard problems we have 100 problems increasing in complexity from 1 to 100. Let us again keep an accurate record of the time, errors, etc., of the learning of these 100 problems. Ten rats would be a sufficient number to start with. It would probably take these ten rats 18 months to learn all 100 of these problems. At the end of that time our records of these 'educated rats' would show separately, for each of the 100 problems, the average time of the first successful trial and the difference in time between this first successful

trial and the succeeding successful trials up to the point where no further improvement could be detected.

Now, in order to obtain data for drawing inferences as to the effect of tuition, let us put ten 'uneducated' rats to work upon, say, problem 80, ten other uneducated rats upon problem 85, ten upon problem 90, ten upon problem 95, and finally ten upon problem 100. One cannot predict absolutely that the records in the two cases would be different, but we should confidently expect such to be the case. In our own experience with the behavior of rats we have the feeling that they work more quickly and more intelligently upon complex problems if they have had experience with simpler problems. This may not be true, but we should like to see it tested upon several species of mammals.

In working out this problem the records of the males would again be kept separate from those of the females.

'Imitation' is another type of behavior which is of general interest to the student of psychology. The study of this mode of reaction requires an enormous amount of time if we desire to test it to any extent under conditions of control. We have shown elsewhere that the only cases of it on record are the apparently sporadic cases cited by Kinnaman, Hobhouse and Porter (neglecting the song imitation in the birds of Conradi, Scott and others). We would venture to suggest that the backward state of knowledge which this phase of animal behavior is in, is due in part at least to the backward state of two questions more elementary than that of imitation.

The first and fundamental difficulty in the way of a study of imitation lies in the *roving* character of *animal attention*. Hobhouse mentions this difficulty with his dog and cat. It is familiar to all. A dog may apparently be *looking* at *you* intently when all the time he is interested in the odor of your boots, as proved by the fact that when you get to the most interesting point of your discourse with him he drops his eyes, walks up to the boot, and investigates it. But that he can be trained to attend to your actions may be shown by any dog which can hunt both rabbits and squirrels. The moment you take your gun he bounds for the woods. Ordinarily he has hunted rabbits more often than squirrels. So he starts off immediately with eyes and nose upon the ground. You stop him, take him to a tree and pat it and say 'squirrels,' repeat it two or three times, and, if he is a well-trained dog, he will hunt squirrels for the rest of the day. We ought to know and must know in some more exact way to what extent we can train an animal to the habit of giving attention to what the experimenter does.

Intelligent dogs with acute visual powers, we should suppose, would serve this purpose best. Infinite time and infinite patience with the education of young animals alone will settle the question as to how far the attention may be cultivated. The exhibitions of trained dogs and horses — usually given by charlatans, since they alone have time to live alongside of their animals — would seem to show that the attentive processes may be carried so far in these animals that they can observe minutiae which escape the eye of the ordinary human observer.

On account of the limited time at our disposal, those of us who have experimented upon animals heretofore have had to study dogs, cats, monkeys, etc., which have not been generally educated nor have they had the specific habit of *giving* attention cultivated. Such a method is somewhat analogous to presenting calculus to a South Sea Islander. It does not appeal to his practical needs, and is not in line with his previous education. Consequently he can make no progress in it. The result might be far different if we took a baby Islander and led him to calculus through a long series of gradual steps.

Another difficulty which is in the way of a thorough study of imitation lies in the fact that we are hopelessly ignorant, in any exact way, of the perceptual processes in animals. Through what avenue or avenues of sense does our animal get his impressions? Certainly we must know this before we can hope to attract the attention of our animal. If a rat uses vision only for crude general orientation, what is the use of letting him *see* another rat tearing away the papers from the hidden door of a problem box and then expecting him to imitate the behavior? It would be foolish to give the dog mentioned by Romanes — the one who always followed the peculiar-smelling hunting boots, no matter who wore them — the visual perception of the removal of a secret bolt and then expect him to go and immediately withdraw the bolt.

If these difficulties are agreed to as being real, they would seem to account in part for the negative results of Thorndike's experiments on imitation in dogs, cats and monkeys.

ENVIRONMENT AND DEVELOPMENT.

Few psychological laboratories in the United States have adequate space for the care of mammalia. None have adequate provision for birds and insects. Harvard's new philosophical building forms a partial exception. At Chicago a single large basement room is all that can be spared for comparative purposes. Clark seems to be somewhat better prepared than this. The conditions at Cornell and

Columbia are, I believe, not much better than here. To properly carry out experiments in mammalian behavior alone, we need conditions suitable for the breeding and growth of a large number of animals. Such conditions are at hand only when we have a large space suitably divided up. Outside of the lack of space, the universities located in cities have another difficulty in the way of housing any considerable number of dogs and cats under a single roof. They are likely to find themselves under arrest for keeping a nuisance. In a noisy community the animals are practically never in a state of repose.

In addition to the need of a large, well-lighted and well-warmed animal house, the need of a considerable stretch of ground at once makes itself felt. This is clearly manifest when we mention the study of the homing instincts in animals. The need of the study of this problem is great. A perusal of the literature on the subject — and it is vast, especially the French literature — will show that even the facts about the ‘return’ are in a chaotic state. The actual perceptual (?) factors involved in the return are in a still more hopeless state. Hypotheses are rampant. They range all the way from the one which endows the pigeon with the ability ‘to directly perceive the end’ — even the curvature of the earth forming no barrier to this, in view of the fact that the pigeon may use the infra-luminous rays (Hatchet-Souplet; Duchâtel) — to that of Cyon who believes the pigeons have a ‘special nasal sense’ distinct from ordinary olfaction which permits them to distinguish the currents of air suitable to return in to the nest. Still another — that of Reynard — claims that the method of return follows the law of Contre-pied — *i. e.*, the pigeon has some kind of registration apparatus which marks down all the turns and twists of the road over which he is borne away from the nest. This registration apparatus works even if the bird is carried away blind-folded. When the bird is released the registrations somehow become effective and when the bird has ‘unwound’ himself he is once more at home! The moment he gets in the familiar neighborhood of his nest he at once begins to use his vision. The law of Contre-pied would of course mean that the return would be circuitous, but as soon as the bird comes upon the familiar landmarks he takes the shortest pathway home.

Many of these hypotheses are mutually exclusive. We ought not to be content until we can at least get a theory which will unify all the facts — but the facts themselves must come first. The obtaining of the facts is a delicate problem. The French investigators are agreed (some of them at least) that a pigeon can return to the nest from a dis-

tance of 500–600 km. over an ocean pathway which, for our senses at least, can offer no kinds of distinguishing marks.

The factors active in the homeward flight of the bee are just as unknown (or rather just as disputed). Bethe, after many experiments on the influence of audition, olfaction, vision, memory images and magnetic force on the return of the bee, finally concludes in the following words: "Die Bienen folgen einer Kraft, welche uns ganz unbekannt ist, und welche sie zwingt, an die Stelle im Raum zurück-zukehren, von der sie fortgeflogen sind. Diese Stelle im Raum ist gewöhnlich der Bienenstock, sie muss es aber nicht nothwendiger Weise sein. Die Wirksamkeit dieser Kraft erstreckt sich nur auf ein Gebiet von wenigen Kilometern im Umkreis." Surely we are not content to let the matter rest here. Fabre finds this homing instinct in the male cat — the factors involved in his return though are just as unknown as in the above-cited cases. This same orienting instinct is found by the Peckhams to be present in the wasps.

If distant orientation does involve some 'sense' or 'force' which is foreign to our own mental makeup, we ought at least, in the words of James, to get as much 'knowledge about' it as we can.

It is fully apparent, we hope, that the behavior of insects and birds must remain in a backward state until an experimental station shall have been established, which will give to the animals naturalness in environment and to the investigator ample space for experimentation.

In thus emphasizing the need of an experimental station for working out the larger problems in comparative psychology it is not our purpose to discourage or disparage the value of the work of the investigator who must necessarily labor under time, space and financial limitations. Some of the best results we have to-day are monuments to what can be done under such limitations. Our purpose has been rather to show that there were broad fundamental problems which will soon have to be solved if our interpretation of individual results is to be accurate. Such an experimental station will not remove the need of as many individual investigators as may be attracted to the field. It will aim, rather, on the one hand, to make possible a more complete interpretation of their results, and, on the other hand, to suggest new problems which can be individually carried out. It will stand for centralization, coördination.

It is obvious that even under adverse circumstances comparative psychology has completely justified its existence. But now that the ground is broken and the more obvious and surface problems have

been successfully attacked, we stand in great danger of allowing our interest to flag — especially is this true when we view the difficulties of making our studies of mammalian behavior more exact and more intensive.

In conclusion we may say that the need to the psychologist of an experimental station for the study of the evolution of the mind is as great as is the need to the biologist of an experimental station for the study of the evolution of the body and its functions.

ADDENDUM TO DR. WATSON'S PAPER.

It may serve to enforce both Doctor Watson's last remark and also the general contention of his paper to note that the recommendations made to the Carnegie Institution by the original 'Advisory Committee on Psychology' in 1902 (see the year-book of the Carnegie Institute, No. 1, p. 197) placed *first* the establishment of a station for animal psychology in coöperation with zoölogy; and the reasons there given are similar to those of Doctor Watson. Furthermore, the recommendation was reached in consultation with the Committee on Zoölogy. That report also included a consensus of opinions from certain of our leading psychologists.

J. MARK BALDWIN.

PSYCHOLOGICAL LITERATURE.

COMPARATIVE PSYCHOLOGY.

La psychologie comparée est-elle légitime? ED. CLAPARÈDE. Arch. de Psychol., 1905, V., 13-35.

In view of the fact that certain biologists have recently denied the justification of the study of comparative psychology on the ground that we are ignorant, and will always remain ignorant of the fact as to whether animals are conscious or not, Claparède proposes to examine critically the arguments of those who would thus suppress it.

One of the first undertakings of such biologists has been to devise a new and 'objective' nomenclature in which to describe the reactions of animals. As is well known, Beer, Bethe, von Uexküll, *et al.*, proposed this nomenclature some years ago. For them the word 'sensation' has been replaced by *reception*, 'sense organ' by *reception organ*, 'memory' by *rémanence de l'excitant*. Visual, auditory, tactual and gustatory sensations are called by their objective equivalents, photo-, phono-, tango-, and chemo-receptions. From time to time others have added to this new nomenclature. M. Nuel (*La Vision*, Paris, Doin, 1904) is the latest author to become listed in the ranks of those arrayed against comparative psychology. Indeed Nuel goes so far as to attack the validity of the psychological method in general. He tells us that it is not only the vision of animals but also that of man which he has taken upon himself to explain 'without the help of any psychological notion.' Claparède remarks that this attempt is entirely new and that M. Nuel has a perfect right to claim for it 'an incontestible right of priority.' 'The most radical authors,' says Nuel, 'believe that they are obliged to apply their principles only to the vision of animals.' Nuel is further convinced that 'visual phenomena demand not a psychological but a physiological explanation.' ('As if these two orders of explanation were contradictory!') Claparède justly exclaims.)

Claparède then goes on to show the reasons for this dissatisfaction on the part of these biologists with the psychological nomenclature. They arise from the gross anthropomorphic descriptions of animal behavior given by Romanes, Lubbock and others. Our author very

justly asks the biologists what the fault is in these explanations of Romanes and others: "Is it because their language is psychological? By no means. The explanation, by 'desire,' by 'curiosity' (referring to Romanes' description of the reaction of the moth to the flame), is at fault not because it is *psychological* but by reason of the fact that it does not conform to the principle of [Lloyd] Morgan; it is not the simplest explanation possible."

Claparède then, by a series of arguments which are at times almost vitriolic, shows that this new objective terminology is often times inexplicit, inconvenient and obscure, and at all times pedantic.

But the gravest danger to comparative psychology, according to our author, lies not in the mere description of animal reactions in 'objective' terminology—this is a merely passive evil. There is a more serious and active danger. "Wishing to account for their observations in comparative biology in physiological language, these investigations of the new school find it necessary, in order to fulfill the obligations which they have taken upon themselves by reason of their so-called objective nomenclature, to lower the facts to the level of their vocabulary. They are like the children's tailor who, being obliged to dress an adult in one of his costumes, cuts off the arms and legs of his unhappy customer!—and they are forced to consider as very simple reflexes phenomena which are without any doubt the result of a complex cerebral activity, but an activity, it is true, which we cannot designate otherwise than by the states of consciousness which are the subjective concomitants of it." It is in this connection that we find the names of Bethe, Loeb and Nuel again mentioned.

The constructive side of the paper is concerned with showing that the suppression of comparative psychology leads logically to the suppression of genetic psychology and finally to that of adult human psychology.

While we sympathize with Professor Claparède in his endeavors to have psychological phenomena expressed in psychological terminology, still we feel sure that his fears for the future of comparative psychology are unfounded. In the first place the *psychologists* will see to it that this science is not suppressed. In the second place we hasten to assure M. Claparède that whatever may be the conditions on the Continent, there is no tendency on the part of American biologists to suppress it. On the contrary, all of our biological laboratories are encouraging such studies. Who could want a more sympathizing attitude than that shown by Donaldson, Howell, Minot, Whitman, Wesley Mills, Parker, Wheeler, Jennings, Davenport, Hodge, C. J.

Herrick and the late C. L. Herrick? The only possible exclusions from this list are Loeb and those trained under his influence. The value of Loeb's contributions to comparative psychology must not be underrated even if later investigations have thrown certain of his results into disfavor. In addition to the intrinsic value of his work we can trace back many contributory investigations in this field either directly or indirectly to his stimulating influence.

There is and can be then no 'war to the death' in this country between comparative psychology and biology. Comparative psychology is rather the common meeting ground of the psychologist and the biologist. It is having and will continue increasingly to have a marked influence upon the training of both the psychologist and the biologist. The psychologist without biological training, who is busied with the study of animal behavior, finds little to express; the biologist, who has no psychological training but is engaged upon the same task, cannot express what he finds—or else, if he tries to express it, he runs either into the absurdity of forming an 'objective' nomenclature or he becomes inexact in his use of psychological terminology.

Ein Fall von Ueberlegung beim Hund? WILHELM AMENT. Arch. f. d. ges. Psychol., 1905, VI., 249-253.

In this article an anecdote concerning the behavior of a dog is reported. The dog under consideration (a two-year-old 'Zwergpinscher') was accustomed to sit on a chair in front of a window which overlooked the neighboring houses and yards. One cold day the dog found his window so thickly coated with frost that his customary view was interfered with. "Was tut nun der Hund? Er leckt mit seiner Zunge die Eisblumen einfach weg, bis das Fenster wieder durchsichtig geworden ist." As soon as a round area about the size of a plate had been cleared away with difficulty, the dog stopped cleaning the window and took up the more natural canine occupation of watching the cats in the adjoining yard. The dog repeated this behavior several times during the winter.

The author tells us that this interesting bit of natural history can be interpreted in a number of different ways. His interpretation is given in the following manner (a rather free translation, by the reviewer, of the author's own dignified and somewhat involved German): By means of the experience of wiping with his snout, the dog hits upon the licking away of, first, the softened layers of ice, and later the more solidly frozen ones. That the dog straightway hits upon the

method of licking is not so surprising, when one thinks of how often during the day the dog licks himself, everything and everybody, and that he surely knows that by licking he can remove a disturbing object. All things considered, we seem to have here the joining together of a series of experiences, ideas (*Vorstellungen*), partly different from one another (wiping with his snout, licking with his tongue), partly analogous (*i. e.*, the licking away of other things and the licking away of the frost on the window), in the interest of an end (*i. e.*, looking out).

The author expresses the series of events otherwise in the following words: "Auf Grund der allgemeinen Erfahrung, dass man mit der Zunge Gegenstände wegglecken kann, und der besonderen, dass sich am Fenster die angelaufene bzw. angefrorene Masse mit der Schnauze wegwischen lässt, gelangt der Hund zur Ueberlegung, dass er die Masse mit der Zunge wegwischt bzw. weggleckt." This is the characteristic of a conclusion (*Ueberlegung*) as illustrated in the practical procedure of the common man. If this act of the dog were done by a human being we should not hesitate to call it *Ueberlegung* — it is only when the act is done by an animal that we begin to bristle at this designation. I may remark, finally, that I wish to reserve judgment upon the degree of voluntariness of the mental processes of the dog in performing this act: I have used the term '*Ueberlegung*' always and not '*Schluss*'; not because I do not hold that this '*Ueberlegung*' is equivalent to an actual psychical '*Schluss*,' but because there is to-day an irritating war of words, between the logicians and the psychologists, over the concept of '*Schluss*.' The author modestly concludes by saying that if anybody else can offer a simpler explanation of the factors involved in this act, he has his, the author's, permission.

The reviewer thinks it is safe to say that upon the basis of the anecdote as it is reported, no one would try to frame an hypothesis as to what mental factors are involved in this act of the dog. Most of us who really have the interest of animal psychology at heart would have modified and controlled the situation by a series of simple and obvious experiments.

If the article under review had been appended to the *Archiv* as a *note* (and put in some inconspicuous place) its publication would have had a doubtful justification: that it should occupy the first five pages of an important psychological journal is inexcusable.

J. B. W.

Respiration and Emotion in Pigeons. JOHN E. ROUSE. Jour. of Comp. Neurol. & Psychol., 1905, XV., 494-513.

The chief value of the experiments under review is in the contribution attempted towards methods of control. Respiratory change is used as the index of psychical status, since this shows minute variations in stimuli and is easily recorded by the pneumograph. The support for the birds which were being experimented upon was a level horizontal board, in which an oval opening had been cut just large enough to admit the breast of an adult bird. In this opening the birds were secured in such manner that the breast projected through. A breast-plate with tambour connections was adjusted from below, thus permitting the curve of the sterno-vertebral breathing movements to be secured. The feet were held in place by tape fastened to hooks behind. A box covered the bird and the experiments were made with darkened room. An electric signal marker was used, which, writing beneath the respiratory line, automatically indicated the time of giving the stimuli. In the case of the visual tests this was rendered possible by using a double-contact key. A third pointer, connected with a metronome beating half seconds, showed the rate of the drum movement. The metronome was enclosed in a felt-lined box. The stimuli were pistol shots, bell ringing; odors of turpentine, ammonia, asafoetida, oil of bergamot, and lily of the valley; red, yellow, green and blue lights; lights of the same color, but of different intensities; concussions upon the table holding the support, and upon various parts of the room. Color preference was tested independently, by illuminating one half of the box containing the bird, with light of one color and the other half, simultaneously, with light of a different color. The lights were furnished by incandescent lamps, the glasses of which were differently colored. The four colors of the visual tests were employed in this experiment also. Each color was used successively with the three others and in every case the position of the bird with reference to the two lights was noted.

The principal results of the series of experiments are as follows: (1) All of the stimuli produced quickening in respiration and also changes in amplitude and contour of the curve. These changes were strongest in the case of concussion and sounds. (2) Those sounds which might be thought of as meaningless to the birds, such as pistol shots, very early lost their stimulating power, while much weaker but significant sounds, such as bird noises, retained their power. (3) No direct relation between intensity of light and the amount of reaction was perceived. (4) Agreement was shown between color preference

and the respiratory quickening caused by colored light. This was taken to prove concomitance between quickening of breathing and agreeable feeling.

The mass of entirely conflicting evidence hitherto discovered, which relates to the last conclusion, however, continues to stand and to negate the validity of the conclusion which the author rather emphatically gives it. The conclusion is rendered still more unwarrantable by the evident fact of the failure in the experiments herewith reported to exclude external and manifestly disturbing stimuli; and by the further fact that the number of records upon which the conclusion is based are comparatively few.

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Die Orientierung der Brieftauben. G. H. SCHNEIDER. Zeitsch. f. Psychol. u. Phy. d. Sinnes., 1905, XL., 252-279.

In a note appended by the editor of the Zeitschrift to the above article, it is stated that Dr. Schneider had intended using the results there communicated in a second edition of *Der Thierische Wille*. Owing to the death of Dr. Schneider a second edition of this book was apparently never completed. It is impossible to make out from the article itself just when Dr. Schneider completed this work. He apparently began it in 1886. The author gives only five references to the literature—the most recent of the five bearing the date 1878. No mention is made in the paper either by the author or by the editor of the rapidly increasing modern literature on this subject.

The experiments are concerned mainly with the education of young carrier pigeons and with the short flights of adults. The question he sets out to prove is this: are the pigeons guided by an inborn sense of direction, which is unknown to us? Or are they guided by the eye? And if the latter supposition is assumed to be true, how are they influenced by topographical relations?

Dr. Schneider's method of experimentation was essentially like that adopted by all other investigators of the pigeon's behavior in distant orientation. The birds were transported in a basket by carriage or rail to the desired distance and were there released one by one. The time of the release, state of the weather, number and characteristic markings of the bird, were all carefully recorded. Trustworthy boys stationed at the côtes recorded the time of the return.

The experiments were made chiefly in and around Pössneck. The distances used were very short—from 3 km. to 42 km. Certain experiments were made to determine the relative ease of orientation between releases made in valleys and on mountains.

His conclusions are numerous, the one of chief interest being as follows: "The assumption that the carrier pigeons possess an inborn sense of direction is an error; for if this assumption were true, then the young pigeons ought to find their way equally well. The investigations have shown, especially those at Könitz, that young pigeons, even at relatively small distances from their home, have the greatest difficulty in finding their way back when the vicinity is at all strange to them, and their home cannot be directly seen." He then concludes that the young birds utilize, in their early flights, the familiar groups of houses, mountains, etc., and that the distances to which a bird may be taken and return may be increased commensurately with the increase in the development of his 'topographical memory.' The author believes that the pigeon can develop not only 'Erinnerungsbilder' but even 'Gedächtnisse.'

Dr. Schneider does not discuss the more difficult feats of the carrier pigeon. He says nothing of their long flights over the ocean. He says nothing of the so-called 'voyaging' pigeons of France. These birds travel over the continent in wagons. A stay of one or two hours in a town enables these pigeons to return to it. He has missed the point in the arguments of those who hold that there are factors in distant orientation which are not explicable by visual sensation or even visual memories. In the first place nobody, we believe, would deny that the pigeon uses vision where he can. And again, it is a mistaken use of the term 'sense of direction' to assume that it does not have to develop. Consequently we should not expect the young birds to return as well as the adult. The term 'sense of direction' is used by careful writers with the implication that there is a definite psychophysical possibility of its being developed—just as there is a definite psychophysical possibility of visual sensations being developed.

In conclusion, we may say that if the article under consideration was published out of respect to the memory of Dr. Schneider, the space allotted to it in the *Zeitschrift* was well used. But if the editor of that journal thought the article would contribute to our knowledge of the factors in distant orientation, or that it was even a good résumé of the facts already obtained, he was laboring under a misapprehension. The article should not have been published under any circumstances without someone's bringing the literature up to date. Had this been done it could then have been shown that Dr. Schneider independently reached certain conclusions which would have been of value if they had been made public at the time of their discovery.

Song and Call Notes of English Sparrows when Reared by Canaries. EDWARD CONRADI. Amer. Jr. of Psychol., 1905, XVI., 190-198.

Conradi in this paper tells of some very interesting experiments upon two English sparrows which were captured in a wild state at a very early age.

The first sparrow, captured when one day old, was reared by a canary foster-mother (they make very poor ones according to the author). During the growing period this sparrow was isolated from all other sparrows and placed in a room containing about twenty canaries of all ages. The characteristic sparrow chirp first developed. This was given less and less, being gradually replaced by a 'peep' which is characteristic of young canaries. This sparrow improved in his vocal efforts, gaining confidence finally to chime in when the canaries would burst into song. His own song apparently resembled the confusion of notes which occurred when the three adult canary songsters were singing their best.

The second sparrow was captured when two weeks old. This bird was fed by hand, and was reared likewise in the room with the canaries. The sparrow peep had of course already appeared when the bird was captured. After being with the canaries some time this sparrow developed a song which more or less closely resembled that of the canaries. "At first his voice was not beautiful; it was hoarse. It sounded somewhat like the voice of female canaries when they try to sing. * * * He sang on a lower scale; he often tried to reach higher notes but did not succeed." Later he learned to trill in a soft musical manner. (Certainly something very foreign to a wild sparrow!) The call notes of the canaries were likewise adopted.

These two sparrows were finally segregated from the canaries and placed in a room where they were flooded with notes from the wild sparrows. For the first two or three weeks the integrity of the canary-sparrow song was maintained. At the end of the sixth week, however, they had not only lost the effects of their early training but had adopted the vocal characteristics of the wild sparrows.

On placing the sparrows again under the tutelage of the canaries it was found that they quickly regained what they had lost.

Dr. Conradi tells us that he is to continue this highly interesting and instructive series of experiments upon sparrows actually hatched and reared by canaries.

The Sense of Hearing in Frogs. ROBERT M. YERKES. Jr. of Comp. Neurol. and Psychol., 1905, XV., 279-304.

Yerkes has shown elsewhere that the frog makes no direct motor response to auditory stimulation. In the present paper he investigates more fully than in his previous paper the effect of an auditory stimulus upon the magnitude of the reaction to a cutaneous stimulation when the auditory stimulus is given (*a*) simultaneously with the cutaneous and (*b*) at definite intervals before the cutaneous stimulation.

After an enormous number of careful tests Yerkes summarizes his results in the following words: "The sound of an electric bell occurring simultaneously with a tactual stimulus markedly increases (reinforces) the leg reflex of green, leopard and bull frogs. If the sound precedes the touch by 1" it is without effect on the reaction; if the interval is not longer than .35" it usually causes reinforcement, whereas for an interval of from .4" to .9" there is partial inhibition of reaction." In a series of curves Yerkes shows the reinforcement or inhibition effect of the auditory stimuli when given at varying intervals before the tactual.

A second series of experiments had for its object the testing of the above-described auditory-tactual reaction when the tympanum of the frog was either partially or totally under water. His results show conclusively that the (green) frog responds to sounds made in the air even when the tympanum is submerged to the depth of 4 cm.

Yerkes also tested the range in pitch to which the ear of the frog is sensitive. He found the range to be from 50 to 10,000 vibrations per second. (Single or double? The Galton and Appunn whistles were used in testing the upper limit; tuning-forks, electric bells with metal and wooden gongs, sudden hammer blows and the human voice were used for the medium and lower limits.)

In order to make sure that the above phenomena were really auditory phenomena and not tactual, Yerkes made some tests upon (*a*) frogs whose tympana had been cut, (*b*) frogs whose tympana and columellæ had been cut, and (*c*) frogs whose auditory nerves had been cut. The results show that sounds still modify reactions of the frog after the tympana and columellæ are cut, while cutting the eighth nerves causes the entire disappearance of the influence of sounds.

In conclusion, we may say that Yerkes' results are definite, clear-cut and valuable.

Bahnung und Hemmung der Reactionen auf tactile Reize durch akustische Reize beim Frosche. ROBERT M. YERKES. Archiv f. d. ges. Physiol., 1905, CVII., 207-337.

The results of the experiments reported in this paper are similar to, and in part identical with, those reported in the paper reviewed immediately above. As may be seen from the review referred to, Yerkes shows that when certain temporal relations exist between the auditory stimulus and the tactual, the former tends to reinforce the reactions of the frog to the latter; while under certain other temporal relations of the two stimuli, the auditory stimulus tends either to inhibit the tactual reaction or else leave it unchanged.

In the present paper these phenomena are discussed under the terms *Hemmung* and *Bahnung*.

We suppose that Dr. Yerkes' reason for making two reports upon very similar, if not identical investigations, was to allow for a separate treatment of the purely physiological aspects of the experiments and the psychophysical.

In the paper under review, the author places this phenomenon of reinforcement and inhibition in the reactions of the frog in its relation to the work previously done upon this subject by Bowditch and Warren (*The Knee Jerk and Its Physiological Modifications*), A. Cleg-horn (*The Reinforcement of Voluntary Musculatur Contractions*), L. Hofbaur (*Interferenz zwischen verschiedenen Impulsen im Centralnervensystem*), and others.

In order that our later comments upon this paper may be clear, we shall translate in full the 'Uebersicht' of Dr. Yerkes:

1. With the greenfrog (*Laubfrosch*) a sound which in itself calls forth no noticeable contraction of the leg of the animal under investigation, shows a modification of the reaction to another stimulus if it is given in conjunction with this.

2. The momentary sound stimulus produced by the stroke of a hammer increases the amount of reaction to a simultaneous tactual stimulus. This increase or reinforcement of the reaction amounts to 50-100 per cent. of the mean reaction (*mittleren Reactionen*) to a tactual stimulus alone. If the auditory stimulus is given before the tactual, reinforcement occurs, the amount of which decreases slowly until the interval between the two stimuli amounts to 0.35"; the auditory stimulus has at this point no apparent effect upon the tactual reaction. By further lengthening the interval, inhibition is produced which continues for the interval between 0.35" and 0.9". Reinforcement is greatest when the stimuli are simultaneous; inhibition is at a maximum when the auditory stimulus precedes the tactile by about 0.4" to 0.6". If the interval is 0.9" the first stimulus has no effect upon the result of the second.

3. Reinforcement is greater in males than in females; the inhibition

is greater and more lasting in females. This circumstance shows evidently that while the males are aroused to activity by certain stimulations of sound, the females have their activity suppressed by similar sounds.

4. A continuous auditory stimulus (such as that made by an electric bell) may produce either reinforcement or inhibition, depending upon the temporal relation of the two stimuli, similar to that produced by a momentary sound stimulus. We found the following differences between the effect of the momentary and the continuous auditory stimulation: A maximum of reinforcement is reached when the tactile stimulus is given about 0.25" after the beginning of the (continuous) auditory stimulus. Reinforcement continues for an interval of 1.2", *i. e.*, if the electrical bell is sounded continuously, the tactual stimulus is reinforced from simultaneity up to 1.2". From this point up to 1.8" inhibition sets in. Both momentary and continuous (auditory) stimulations produce first reinforcement and then later inhibition of the characteristic reaction to a tactile stimulus.

5. The reinforcement-inhibition curves in frogs are similar to the corresponding curves in man.

6. In the case of the different pairs of stimuli whose interference was investigated, reinforcement and inhibition were present. The first stimulus reinforced the reaction to the second, so long as the interval did not rise above 0.4", while it later inhibited this. Whether the reinforcement-inhibition curve as it was obtained in the experiments described, can be maintained as valid in a similar manner for any pair of stimuli, in whatever relation their reactions stand, remains to be investigated.

These facts are of course very interesting to the physiologists—but they are interesting to psychologists as well. Indeed it is a little hard for us to see any valid reason for the separation of these two papers. In the first place, although the German article is concerned purely with the physiological aspects of the reactions of the frog, we would surely have forgiven Dr. Yerkes for discussing this phase of the investigation in his English paper, 'The Sense of Hearing in Frogs.' The strictly new material in the German article does not cover many pages. By so doing he would have saved American investigators from having to wade through 30 pages of German, only to find that the English article had already put them in possession of most of the experimental data.

Finally, we should like to enter a protest against having our American researches printed in Continental journals and in Continental languages—at least until there has been an entire reconstruction in the mental attitude of the average German and French investigator to American research productions. Many of us have had to dig out patiently the results of German and French investigations, only in the end to find them marred (and in many cases absolutely valueless) by lack of consideration of the results obtained in our American laboratories.

The Habits of Certain Tortoises. H. H. NEWMAN. Jr. of Comp. Neurol. and Psychol., 1906, XVI., 126-152.

This valuable study of the instinctive life of the five principal forms of tortoises to be found in Lake Maxinkuckee, in northern Indiana, does not lend itself to a detailed review. The main features of the paper, however, can be briefly presented.

Newman shows that the 'interesting,' and apparently more intelligent forms of tortoises, cannot be kept in captivity and introduced to the various forms of 'problem boxes' now so common in the studies of animal behavior. The only other method left for studying these animals is the more laborious one of watching them 'in their daily rounds and occupations.' If one does this for a long enough period of time one becomes able, so the writer assures us, 'to diagnose their dispositions and comparative intelligence.'

Newman shows that each of the five varieties studied has a definite 'species character.' He shows also that there is not only a species character but a sex and an individual character as well.

Certain traits and habits, however, are common to all five of the species under investigation. These common characteristics of chelonian behavior may be summarized as follows:

"1. The love of warmth and repose seems to be one of the few dominant factors in tortoise life. In some cases they seek warmth to their injury. On the other hand, lack of heat is more apt to cause death than any other factor.

"2. Extreme wariness when basking is noticeable in all species that habitually bask.

"3. There is a marked variation in the degree of fierceness or timidity exhibited by different species. These characters seem to run parallel with an aquatic or a terrestrial habitat, aquatic species being fiercer than those with a tendency toward a terrestrial life.

"4. Naturally enough, it is possible to domesticate the less fierce and less sullen species, while captivity inhibits normal activities in the fiercer and more sullen species."

The reviewer cannot refrain from mentioning one specific observation made by Newman in the course of this investigation. It concerns the question of 'distant orientation.' He mentions the fact that the females of *Graptemys* at times lay their eggs in soft earth far away from the body of water in which they live. "The eggs hatch, as a rule, late in August or early in September, the young burrowing to the surface through the sand. When they emerge they are covered with sand that adheres for some time. Their *instinct* [*italics mine*] directs

them unerringly toward the water and they frequently have to travel almost incredible distances before reaching the lake or a tributary stream. On two occasions I have found recently hatched *Graptemys* at a distance of about a quarter of a mile from the water, traveling steadily and in an approximately correct direction toward the lake. At the observed rate of progress they would reach the lake in about two days." Evidently there is a good opportunity here to investigate the factors entering into this 'instinct.' These little animals could hardly be said to have developed a 'topographical memory,' and certainly if there happened to be a hill in the way — or even a good-sized log — they could not have 'directly perceived the end.' What is it that turns them 'unerringly' to the water? Smell? We are sorry that Newman's notes are not more complete at this point. He tells us, however, that the present study is only a preliminary one. We hope that when he continues these investigations he will, if possible, introduce some control experiments looking to the analysis of the factors at work in chelonian orientation.

On the whole, Newman has done his difficult and trying task with a great deal of thought and care. This investigation gives us a mass of useful data on the habits and instincts of the most important forms of tortoises.

J. B. W.

*The Establishment of an Association Involving Color-Discrimination in the Creek Chub, *Semotilus atromaculatus*.* MARGARET F. WASHBURN and I. MADISON BENTLEY. Jr. of Compar. Neurol. and Psychol., 1906, XVI., 113-125.

The work reported in this article extended from July 31 to August 18, presumably of last year. The subject used was a female of the common species of creek chub (*Semotilus atromaculatus*). Throughout the experiment the fish was kept in a circular glass tank 50 cm. in diameter and 45 cm. deep. The apparatus for feeding 'consisted of two like pairs of dissecting forceps which were faced on the outer surfaces with four-cornered strips of wood 5 × 5 mm. across and 70 mm. long.' These strips were fastened to the forceps by means of small rubber bands, and projected about 5 to 10 mm. beyond the metallic points.

The method adopted was designed 'to test color-discrimination by establishing, if possible, an association between a certain color and food.' The general method is worked out under two sub-methods:

I. *The Method of Inhibition.*—The colors of the strips in this test were dark red on one of the pairs of forceps and a brighter green

on the other. A small live grasshopper was held in the forceps. Only one pair of forceps was used at a time. When the fish was in a certain position at the bottom of the tank the grasshopper was thrust under the surface of the water. "*The fish was allowed to take the food from the red forceps; but when it snapped at the green pair, the food was quickly withdrawn.*" As a result of this method the authors tell us that "neither the times nor the observed behavior of the fish indicated any constant difference in the response to the two colors used." It was decided that even though the fish associated the red color with success in obtaining food, it was unable to inhibit the reaction to the green stimulus.

II. *The Method of Choice.*—After about the fourth day (?), one hundred and thirty-one trials having been made, the above method was modified. "*Both pairs of forceps were presented at the same time, the red baited and the green empty.*" The tank was divided into two compartments by a thin wooden partition and an opening was left at each end of the partition, allowing the fish to pass freely from one side to the other. "With the subject in compartment *A*, the forceps were suspended side by side in the middle of compartment *B* and about two inches from the partition. They were held in place by being slipped vertically into narrow grooves sawed in a horizontal strip which ran across the tank just above the surface of the water, parallel with, and attached to the upper edge of the partition. After the forceps had been set into position one of the gates, right or left, was opened and the fish allowed to swim to compartment *B* and to secure the food from the forceps." To avoid errors of space the two pairs of forceps were constantly interchanged in position and the two gates so used that the fish was allowed to enter on the side of the bait only half of the time.

A few tests were made each day, under as nearly uniform conditions as possible, apparently, first, with the red forceps baited with mealworms, then from one to four tests were made with neither baited. This latter part of the test undoubtedly operated slightly against the formation of the association of food with red. If the experimenters had used more subjects they could have avoided this error, and for other reasons the results would have been more satisfactory. Due precaution seems to have been taken against the influence of the smell and the sight of the food. From the fish's behavior the sight of the *food* seems to have had but little effect on the reactions and the smell probably had no effect. The red strips were varied in brightness to make sure that the fish was not discriminating on that basis. Some tests were made with blue instead of green strips. The results are interesting. Only the totals can be given here.

Total number of tests made from July 31 to August 9.....	226
Red (with bait) chosen first.....	169
Green ¹	13
Number of tests made with no bait	44
Red chosen	42
Green chosen.....	2

From August 10 to 12 blue was substituted for the green. Thirty tests were made with the red baited and ten without. The red was chosen every time.

Now, after the association had been formed between the food and the red color the experiment was reversed, the bait being held in the green forceps. Every precaution taken above was, seemingly, observed in this test. The results follow:

Total number of tests (Aug. 13-18)	69
Red chosen first.....	18
Green (now with bait) chosen first.....	35

In sixteen tests with neither forceps baited, red and green were each chosen half of the times.

The experimenters conclude that the '*Semotilus atromaculatus* distinguishes red from green and from blue pigments, the discrimination being independent of the relative brightness of the colors'; that such 'successes' as the getting of food have powerful enough consequences to *guide*, but not to *inhibit* 'an animal in the performance of an instinctive action.' The positive part of this conclusion seems to have good grounds, but the negative is certainly founded on too meagre data.

It is to be regretted that more subjects were not used and that the experiment was not carried on further. While the point at issue seems to have been pretty well established, so far as this subject is concerned, there are many other interesting problems that arise in the reader's mind. By testing many subjects as carefully as this one was tested, and by certain minor improvements in method, this experiment could be carried into a profitable examination of the formation and persistency of the 'associative memory' of the fish. The results would be fruitful to comparative psychology. It would seemingly be possible to exhibit the bait, if necessary, with *both* colors and thus absolutely to eliminate the possibility that the fish was reacting to the sight of the bait and not to the color. In one case the bait could be inside of a thin test tube. In a very careful test it would be worth while to regulate the light in some way so that it would be practically

¹ Most of the mistakes, *i. e.*, choosing the green, were made at the beginning of the tests.

uniform in intensity when the bait is viewed at different angles by the subject.

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Wasps Social and Solitary. GEORGE W. and ELIZABETH G. PECKHAM. Boston and New York, Houghton, Mifflin and Co., 1905. Pp. 306 + xiv.

A part of the material here presented was published several years ago by the Wisconsin Biological Survey under the title 'Instincts and Habits of the Solitary Wasps.' The present book contains some new material, but in the main it represents a revision of the former work. In its present form the book is a good deal more accessible to the general reader than the former volume. To anyone familiar with the careful and painstaking work of the Peckhams, with their sometimes quaint and always charming style of presentation, the present volume needs no recommendation. Would that all so-called 'nature students' might take a much-needed lesson from the Peckhams and learn how to combine accuracy of observation with a clear, literary style of presentation!

The thirteen chapters in the book are devoted to the following subjects: I., Communal Life; II., *Ammophila* and her Caterpillars; III., The Great Golden Digger; IV., Several Little Wasps; V., Crabo; VI., An Island Settlement; VII., The Burrowers; VIII., The Wood-Borers; IX., The Spider Hunters; X., The Enemies of the Grasshopper; XI., Workers in Clay; XII., Sense of Direction; XIII., Instinct and Intelligence. Since it is impossible to review the book as a whole in any adequate way, we shall confine the critical part of our review to the chapter entitled the 'Sense of Direction.'

The Peckhams do not believe that the wasps have any innate sense of direction. They took definite steps to prove this position. Fifty-five yellow jackets were captured at their nest one morning. One observer carried the wasps out on the lake near an island to the distance of one eighth of a mile. The other remained near the nest to note the return of the wasps. The nest was closed the night before. On the morning in which these observations were made the 55 wasps were allowed to fly into the wasp cage, then the nest was again closed. This made it possible to observe the number of wasps who returned from the place of liberation. Twenty wasps were first set free. These all without exception flew toward the island and away from the nest. The remainder of the wasps were then carried farther away from the

island (one eighth of a mile) and liberated. They seemed much confused, some returned to the boat, alighted, but finally flew away; others circled higher and higher, finally flying away in many different directions. Of the fifty-five wasps liberated thirty-nine returned in less than an hour. On account of the confusion on the part of the wasps when they were first liberated, and by reason of the fact that many of the wasps at first took a direction opposite to that of the nest, the authors conclude that the above species at least possess no innate sense of direction, but that they are guided back to the nest by visual landmarks and the 'memory' of locality.

These experiments are not very convincing, in view of the fact that capturing the wasps entails the stirring up of the very powerful emotion of fear in them. Any one who is ready to ascribe a special sense of direction to the wasp might easily say that the fear had disturbed the normal functioning of the mechanism used in distant orientation. If this were true we should expect the insects to scatter in all directions. Several other experiments of the same general character were tried by the Peckhams, all leading to similar results.

An entirely different experimental procedure was adopted in testing the method of orientation of the solitary wasps. Many species of solitary wasps were observed in the act of making nests in *new localities*. It was found that during the process of nest building a solitary wasp will make many short flights, zigzagging about in all directions—spying out the neighborhood according to the Peckhams. Not until every nook and cranny in the vicinity has been explored will the wasp venture for any long distance after the indispensable caterpillar. According to our authors, many of the solitary wasps have great difficulty in finding their way back to the nest. The Peckhams had to be extremely careful not to disturb the details of the locality of the nest. Even the breaking off of a leaf which covered the nest caused a wasp of the species *Aporus fasciatus* to lose her way entirely. The nest was found immediately when the leaf was returned. These results are in agreement with those obtained by Loeb (*Physiology of the Brain*, p. 226).

It is interesting to compare these results with those obtained by Bethe in experimenting upon orientation in bees. Bethe was able to alter the face of the entire neighborhood of the bee-gum and to mask it in every conceivable way, but the bees returned to the gum without being confused in the slightest degree. The slightest displacement of the entrance-exit opening to the gum, however, — such as that produced by rotating the gum for 45° or more on its vertical axis — caused

the greatest confusion in the behavior of the bees. They would return and congregate on the side of the gum where they had customarily found the entrance — only by degrees was the new location of the opening found and made use of. One other interesting experiment of the same type was made by Bethe: Early one morning after the bees had practically all left a gum which faced the east, he drew it straight back for a distance of two meters. The bees on returning collected en masse in the air around the old position of the gum, failing utterly for a long time to see the gum which was continually in plain view. Vision would thus seem to play little part even in the adjustment of the bee to objects near at hand.

As far as concerns the giving of any crucial positive evidence upon the problem of *distant orientation*, this work of the Peckhams leaves us practically where we were before. It does give us an accurate account, however, of the behavior of the solitary wasps in leaving the nest and in returning to it. From the Peckhams all we may unequivocally conclude is that the solitary wasps make their proximate orientation largely by the aid of vision. From Bethe's work on the bees we think it safe to say that the kinæsthetic impressions play a large part in orientation to objects close at hand.¹

The book of the Peckhams is valuable as a whole because it gives us an accurate description of the types of behavior of many different genera and species of wasps.

J. B. W.

Contribution à l'étude du problème de la reconnaissance chez les Fourmis. H. PIÉRON. Extrait des Comptes rendus du 6^{me} Congrès intern. de Zoologie, Session de Berne, 1904, 482-490.

The paper sets forth the results obtained by the above investigator from certain experiments designed to verify the rôle played by smell in recognition among ants. Three species of ants were experimented upon, the *Aphænogaster barbara nigra*, the *Formica cinerea* and the *Camponotus pubescens*. The first-named species is very deliberate of movement, of various sizes, almost blind, and of a warlike nature. The last two are very agile, very keen-sighted, and extremely peaceable, preferring flight to a struggle.

In his experiments he used juices made by crushing some of the ants, filtering the resulting liquid and diluting it with pure water. The experiments were repeated many times, neuters being used in every case. Two series of experiments were carried on, one upon the ground, the other in a closed flask.

¹ Bethe, however, does not draw this conclusion.

The following results were obtained:

In the case of the *Aphænogaster barbara nigra*, when a neuter of one nest (*a*) was dipped in the juice of another nest (*b*) and was then placed among the neuters of (*b*), it was not attacked until the odor had evaporated. On the other hand, when it met a single neuter of (*b*) after being so dipped, it made an attack which was not reciprocated. Inversely, when a neuter of (*a*) was dipped in the juice of (*b*) and was then placed among the neuters of its own nest, it was instantly attacked. These attacks ceased after a time, presumably after the odor had evaporated. The results were practically the same when the ants were placed in a closed flask, although the abnormal conditions made the results less clean-cut.

In the cases of *Formica cinerea* and *Camponotus pubescens* no very definite results were obtained, either on the ground or in a flask, because these ants sought safety in flight.

A final series of experiments was carried on with the *Aphænogaster barbara nigra* and the *Formica cinerea*. The results obtained from the experiments conducted on the ground were poor, because the *Formica cinerea* avoided a struggle by fleeing before the *Aphænogaster barbara nigra* could make an attack. In a closed flask, an *Aphænogaster barbara nigra*, whether dipped or undipped in the juice of the *Formica cinerea*, was not attacked by the latter, but *Formica cinerea* was attacked by *Aphænogaster* whenever the latter could get near enough. Inversely, in the majority of cases, *Formica cinerea* dipped in *Aphænogaster* juice was not attacked by *Aphænogaster* until the odor had evaporated. *Aphænogaster* dipped in *Formica cinerea* juice was attacked by its own nest-mates. Nothing definite was obtained from the inverse case.

These meager results would probably not have been published if the author had read the classical and detailed work of Miss Adele M. Fielde on the Power of Recognition among Ants. The only excuse the reviewer offers for noticing the article is that it deals with species of ants different from those used in Miss Fielde's investigation.

MARY ICKES WATSON.

CHICAGO, ILL.

The Reactions of Ranatra to Light. S. J. HOLMES. Jour. Comp. Neur. & Psych., 1905, XV., 305-349.

The subject of study is phototaxis in the *Ranatra fusca*. The general purpose is to determine whether these phototactic responses as exhibited under the experimental conditions are to be explained wholly in reflex terms, or whether they can be modified by past experience

and may be partly explicable in terms of some 'pleasure-pain conception. The responses studied are certain swaying movements of different parts of the body, certain bodily postures and movements of the organism as a whole in relation to the light. The modifying conditions employed were the effects of contact, temperature, cerebral hemisection, the covering of various parts of the eyes, etc. *Ranatra* exhibits both negative and positive responses, the latter being the more normal or usual type. The type of response is experimentally controllable, the negative reaction being induced by contact, darkness, and diminished temperature. These negative responses are associated with a condition of sluggishness, or lowered phototonus, and are interpreted as due to changed conditions of the nervous system. Positive reactions may be persisted in till fatal results occur. Several experiments prove quite conclusively that past experiences may be operative in partly determining present conduct. The author is of the opinion that the method of trial and error plays only a subordinate rôle in making adjustments to novel situations.

The author claims, or rather perhaps admits, that all the responses are to be considered partly, and a great many entirely, as mechanical and reflexive in nature, and in fact the evidence abundantly confirms this position. Furthermore, he believes that certain of the reactions are partly determined or influenced by considerations of prospective pleasure or pain. The fact that positive phototaxis may lead to disastrous results is admitted to be a grave and serious objection to the view, but yet the author maintains quite fairly, I think, that this conduct under the unusual experimental conditions does not *necessarily* constitute an insuperable objection. The possibility of such modifying central conditions as it is necessary to assume is supported by the facts that light impulses must travel through the principal nervous centers, and that central influences are evidenced in the cases of learning and the change from negative to positive reactions. The positive evidence adduced in support of the contention is drawn from the experiments in which various parts of the eyes are covered without interfering markedly with the accuracy of the movements towards the light. These movements are difficult to explain by a reflex theory, are hardly the result of a progressive approximation by the trial and error method, but give the impression of an apparent felicity of effort. The author states the conclusion in a very conservative and tentative fashion, though it seems apparent by reading between the lines that he believes much more strongly in the truth of his conclusion than his words indicate, or for that matter than his facts

conclusively warrant. Probably this is a characteristic attitude of a large number of careful experimenters on animal behavior. A long course of observation on some organism leads to a pretty definite private conviction as to the existence of some degree of an intelligent type of behavior when the very phenomena inducing the belief are so vague, intangible and merely suggestive in character as to elude not only their experimental isolation, but even verbal description.

HARVEY CARR.

UNIVERSITY OF CHICAGO.

The Selection of Random Movements as a Factor in Phototaxis. S. J. HOLMES. J. of Comp. Neurol. and Psychol., 1905, XV., 98-112.

The results of the experiments reported in this paper show that the act of orientation to light in the earth worm (similar experiments were made upon the leeches, the larvæ of house flies, blow flies and other insects) does not take place in accordance with the theory of 'forced orientation.' As is well known, the earth worm is negatively phototactic. "As the worm crawls it frequently moves the head from side to side as if feeling its own way along. If a strong light is held in front of the worm it at first responds by a vigorous contraction of the anterior part of the body; it then swings the head from side to side, or it draws it back and forth several times, and extends again. If in so doing it encounters a strong stimulus from the light a second time, it draws back and tries once more. If it turns away from the light and then extends the head, it may follow this up by the regular movements of locomotion. As the worm extends the head in crawling it moves it about from side to side, and if it happens to turn it towards the light it usually withdraws it and bends in a different direction. If it bends away from the light and extends, movements of locomotion follow which bring the animal farther away from the source of stimulus."

In other words, the light induces a general state of activity leading to random movements.

The first movement induced by the light may be either towards it or away from it. If towards the light it is checked, the animal draws back, and movement, usually away from the light, then follows. Since this movement does not lead to further stimulation, it is prolonged farther. The final result of these random movements will thus eventually bring the less sensitive posterior end of the animal into the direction of the rays of light.

Holmes used the beam of the projection lantern (passed through an alum cell) for the stimulating light in these experiments. His method was essentially as follows: The worm was allowed to crawl on a wet board; when crawling in a straight line it was quickly lowered into the beam of a projection lantern in such a way that its body would lie at right angles to the rays.

According to Holmes the light reactions in the earth worm (and in the other forms mentioned above) are really a resultant of two motor responses: "First, the activities of locomotion which are set up by the stimulus of the light, and second, the act of jerking back and bending the body from side to side in response to a strong stimulus in front. Here are two instincts or reflexes, however we may be pleased to call them, which are in a measure antagonistic in that the first is frequently overcome by the second. The direction of the external stimulus determines which of these two instinctive tendencies predominates."

The author does not wish to put himself upon record as regards the problems whether conscious selection is present in these organisms, or whether any association is established between stimulus and reaction.

Reactions to Light and Mechanical Stimuli in the Earthworm, Perichæta bermudensis (Beddard). E. H. HARPER. Biol. Bulletin, 1905, X., 17-35.

Harper shows, in the present paper, that while Holmes is right in concluding that the act of orientation in the earthworm brought about by the influence of a beam of light of the intensity of the projection lantern is accomplished by the following up of random movements, he is not right in supposing that all acts of orientation to light in this organism take place in accordance with this method. On the contrary, if the light stimulus is made more intense the orientation is direct. If a worm crawling in a straight line is lowered suddenly into a beam of direct sunlight, the anterior end is turned away from the light, and by a series of turns the worm gets into an oriented position and crawls directly away from the light. "Usually the result is produced without a false movement." If the paper or board upon which the worm is crawling is turned as the worm turns, in such a way that the rays of light are kept at right angles to the path of the worm, the worm may thus be made to travel continuously in a circle without trial movements.

The earthworm is thus oriented directly by light, but owing to the low degree of sensitiveness its movements are uncertain except in light

of great intensity. Harper agrees with Holmes that the first effect of light is to produce general restlessness inducing locomotion. In light not strong enough to produce direct orientation, the worm projects its anterior end in any direction. If towards the light, the worm after stretching out its anterior end will again retract it as if stimulated. If the worm is checked only after making an extension movement towards the light the conclusion would seem to be, says Harper, that the anterior end is more sensitive when extended than when in the contracted condition. He then shows by further experiments that this is the case. If a worm in the contracted state is suddenly stimulated by a strong light, the stimulus leads only gradually to movement. If, on the contrary, one shades the light from a worm crawling on moist paper, the worm will make a sudden response by jerking back its head the moment it is protracted into the light.

Harper thinks that the difference between the sensitivity of the earthworm to light in the contracted state and in the extended state will account for the random movements observed by Holmes. The worm begins these random movements when in the contracted state, and consequently when its sensitivity to light is least. "The nature of its locomotion and of the sensitive elements in its skin necessitate the alternation of states of low and high sensitiveness. The random movements of an earthworm under light stimulation are consequently of an entirely special character, due to causes inherent in its structure."

The author then shows that the anatomical basis for this alternation of high and low degrees of sensitivity consists in the fact that the light cells of a worm in the contracted state (the light cells are to be found in the basement membrane) are shut off from the source of light by means of the thickening of the epithelial layer and to the in-rolling of the most sensitive regions, viz., of the anterior end in which the light cells are most numerous.

Harper next tested the sensitivity of the earthworm to light under conditions which approximate the normal burrow life of that animal. In the burrow the movements are longitudinal. He found that the axial movements initiated by the anterior and posterior ends are more definitely controlled by the stimulation of light and by a weaker stimulus than are the lateral movements. Lateral movements tend more to be random and are directed only by stronger stimuli because the organization of the worm is chiefly adapted to burrow life and not to an open air life.

Dr. Harper's paper is an excellent contribution on the experimental side. In his general conclusions, however, some general statements

are made which we cannot agree to if we have interpreted them correctly. After concluding that the reactions of the earthworm are far removed from the sort of 'trial and error method' of the Infusoria, as analyzed by Jennings, and that they do take place by a 'direct reflex,' he tells us: "Methods of trial and error in reaction to light and other ordinary stimuli have clearly been supplanted by more definite responses in all but the protozoa and certain other low types of animal life. * * * For the trial and error method is clearly supplanted in the ascending scale of animal life by reactions of definite nature, in the case of responses to the ordinary stimuli."

Certainly we were of the opinion, at least until the advent of Jennings' work on the protozoa, that the method of trial and error is exemplified *only in the ascending scale of animal life*. Our chief reason for welcoming the work of Jennings is that if his observations are true that protozoa adopt the trial and error method, we are enabled to unify our conception of animal behavior and to bring all types of behavior under the one rubric.

J. B. W.

Some Points Regarding the Behavior of Metridium. LULU F. ALLABACH. Biol. Bulletin, 1905, X., No. 1.

Certain reactions of *Aiptasia* to food were found by Jennings to be due to a state of hunger. What these reactions were this paper does not say. It tests the part hunger plays in reactions of *Metridium*. It was found that as hunger decreased the reactions to food became slower. After a time the outer tentacles refuse filter paper (soaked in meat juice) and later meat. Next the inner tentacles refuse first the filter paper and then the meat. Lastly if filter paper is placed on the mouth it is not ingested. The mouth never refuses meat, but 'from lack of assistance from muscular contraction' it becomes impossible for the cilia to draw the food inward. Whether this lack of muscular assistance is due to fatigue or to satiety we are not told. That when the tentacles cease to react it is not due to fatigue is proved: for, if *Metridium* is satiated, having been fed from one side of the body only, the tentacles on the other side which have not been fatigued refuse food. Moreover, they continue to refuse food for several hours, and fatigue lasts but a few minutes.

Fatigue does occur, however, and explains the reactions described by Nagel in an earlier paper. Long before *Metridium* is satiated the outer tentacles of any one spot refuse, after a short time, first the filter paper and then the meat; but the tentacles on other parts of the

body will still accept food for the time being. Miss Allabach made certain experiments which seem to disprove Nagel's idea that these reactions are due to judgment on the part of *Metridium*. The food was removed from the œsophagus. The tentacles behaved as before. The food had not been digested and *Metridium*, therefore, could not judge by experience that the food was not good. The conclusion is that the tentacles become fatigued.

The problem is a significant one. The method, so far as it goes, is good. Both suffer because Miss Allabach's report is inadequate and not well organized.

CLARA JEAN WEIDENSALL.

UNIVERSITY OF CHICAGO.

REPORTS.

MEETING OF EXPERIMENTAL PSYCHOLOGISTS.

On April 18 and 19 the third annual meeting of Experimental Psychologists was held in the Yale laboratory. No formal program was made up before the meeting and no papers were read. Informal reports were given by representatives of the different laboratories, of investigations under way, and of those recently completed but not yet published. Following each report there was much free discussion. On Wednesday evening the members dined at the Graduate Club and spent the evening in an informal smoker.

On Wednesday morning Professor Titchener reported for Cornell, and characterized the work of that laboratory as being in general an experimental reëxamination of much of the matter which has been current in psychology. He specifically mentioned three lines of investigation: first, a more exact introspective analysis of the feelings; second, a like description of the commoner organic sensations designated in every-day speech by such expressions as 'a lump in the throat'; and third, a series of tests of mental ability. After a discussion the morning session was concluded by the reading of a report from the Chicago laboratory in the absence of its authors, Drs. Carr and Allen. This paper reported a case of voluntary localization of objects in depth through change of accommodation while convergence remained the same, and of voluntarily holding an object at a given localization while convergence varied. The discussion of this report extended into the afternoon and brought out a report by Professor Heinrich, of Krakau, on similar work done by him in Poland. His

general conclusion, in opposition to the conclusion of Drs. Carr and Allen, was that changes in accommodation affect localization only indirectly through the resulting changes in the retinal image.

The Wednesday afternoon session was occupied with reports from Professors Sanford and Dodge and a short report from Mr. Loomis of the Yale laboratory. Professor Sanford reported investigations in learning as the chief subject of research at present going on in the Clark laboratory. He mentioned particularly the learning process which is involved in the use of the typewriter, and in playing chess, with an accompanying introspective analysis of this process. He also mentioned studies on the favorite number, as it appears in guessing contests, and of the reasoning processes as revealed, for example, in the solution of problems of division. Professor Dodge reported an investigation on the influence of the pre-exposure and post-exposure fields on the length of time necessary for the recognition of visual impressions. He found that the length of time was markedly different for differences in the complexity and illumination of the pre-exposure and post-exposure fields, and concluded, in general, that the change is due to a peripheral process. Mr. Loomis reported graphic records of the movements made by various subjects in lifting weights subject to the familiar illusion which appears when the weights are of different bulk, but of like intensity.

On Thursday morning Professor Woodworth reported for Columbia. He referred briefly to investigations of a statistical nature, to an investigation on reading, to others on practice, on the relation of the position of the body to mental activity, on reaction times, on color mixing and on the capacity for learning as shown in the behavior of paramecium. He also reported more fully an investigation of the cue to voluntary movements. This investigation was carried on by means of introspection during various voluntary acts. The results pointed to a mental state, having as its chief element something different from the sensational or motor content and corresponding on the physiological side to processes in the association areas. Dr. Baird reported for Johns Hopkins. He described an investigation on the reverse of the weight illusion, in which the size remained constant and the weight varied, and a study of the perception of direction during movements of varying amplitude on the skin. He reported more fully an investigation of the relation of the pigmentation of the macula to the perception of color stimulating that region of the retina. Messrs. Cameron and Freeman of the Yale laboratory occupied the remainder of the morning session in reports of investigations on tonal production and distraction, and on writing.

During the afternoon Professors Holt and Pierce and Dr. Porter made reports, and the equipment of the Yale laboratory was inspected. Professor Pierce reported an investigation on stereoscopic fusion. He found that in the large majority of the cases which he investigated stereoscopic fusion did not take place and there was either false or equivocal interpretation. Dr. Porter reported a continuation of his investigations on the variability of instinct in nest-building spiders, and an investigation on reasoning in abnormal subjects. Professor Holt's report dealt with the thresholds of depth recognition through changes in convergence, with color vision in the immediate neighborhood of the blind spot and with the effect of variations of pitch on the localization of sounds. During the session the exercises which make up the experimental course at Yale were described and the apparatus used in this course was demonstrated. Professor Dodge also demonstrated the exposure apparatus with which he made the investigation on visual recognition above mentioned. It was so arranged that successive fields could be exposed by transfer of light from one to the other by mirrors, without motion of the field.

The following members were present and participated in the discussions, though they presented no reports: Dr. Yerkes, Professors Thorndike and Davis.

The invitation of Professor Witmer to hold the next meeting at the University of Pennsylvania was unanimously accepted.

FRANK N. FREEMAN.

YALE UNIVERSITY.

BOOKS RECEIVED FROM APRIL 5 TO MAY 5.

Le sentiment et la pensée. A. GODFERNAUX. 2e éd. revue. Paris, Alcan, 1906. Pp. 205. Fr. 2.50.

Idées générales de Psychologie. G. H. LUQUET. Paris, Alcan, 1906. Pp. 295. Fr. 5.

Congress of Arts and Science. Vol. II. Politics, Law and Religion. Vol. III. Language, Literature and Art. Ed. by H. J. ROGERS. Boston, Houghton, Mifflin & Co., 1906. Pp. 661 and 680. \$2.50 each.

Enigmas of Psychical Research. J. H. HYSLOP. Boston, Turner & Co., 1906. Pp. xi + 427.

On Life after Death. G. T. FECHNER. Trans. by H. WERNECKE. New ed. Chicago, Open Court Co., 1906. Pp. 135.

The Recitation. S. HAMILTON. Lippincott's Educ. Series, ed. by M. G. BRUMBAUGH. Philadelphia, Lippincott, 1906. Pp. xi + 369.

Greek Theories of Elementary Cognition, from Alcmaeon to Aristotle. JOHN I. BEARE. Oxford, Clarendon Press; New York, Frowde, 1906. Pp. viii + 354. 12s. 6d. net.

NOTES AND NEWS.

DR. J. W. BAIRD, of the Johns Hopkins University has accepted an appointment as instructor in experimental psychology in the University of Illinois.

FRANK THILLY, Stuart professor of psychology at Princeton University, has accepted a call to Cornell University, as professor of philosophy in the Sage School of Philosophy.

Science announces that Dr. Kate Gordon, associate professor of psychology in Mt. Holyoke College, has been appointed instructor in educational psychology in Teachers College, Columbia University.

THE Psychological Laboratory of Bryn Mawr College will open next Fall in new, commodious and well equipped quarters in a wing of the Library Building. It will be as heretofore under the direction of Professor Leuba.

PROFESSOR JOHN DEWEY, of Columbia University, has been appointed Lecturer in Greek Philosophy at the Johns Hopkins University for the year 1906-7. He will give a course of ten lectures on 'Problems of Greek Philosophy,' beginning after Thanksgiving.

FOLLOWING the suggestion of one of our correspondents, who finds some confusion among our different publications arising from their identical color, we are adopting a new cover for the MONOGRAPHS and also one for the INDEX. The BULLETIN will continue to appear in white and the REVIEW in blue.—ED.

THE
PSYCHOLOGICAL BULLETIN

MEMORY OF SKILLFUL MOVEMENTS.

BY PROFESSOR EDGAR JAMES SWIFT,

Washington University, St. Louis.

The purpose of this investigation was to determine the length of time that would be needed to attain a degree of skill in typewriting equal to that which the writer had acquired in 1903 at the close of his investigation¹ of this type of learning.

The experimental work of which this is the memory test closed on December 25, 1903. This test was begun January 29, 1906. Two years and thirty-five days had therefore passed, and during that time the subject (the writer) had not touched any style of typewriter until one week before the present test was undertaken, when he wrote a short letter of about fifty words. The apparent ease with which these few words were written after the lapse of so much time was so striking that a memory test was at once decided upon. The test lasted ten days with the omission of the intervening Saturday and Sunday. In order that the significance of the curve may be more evident the original curve showing the progress made by the subject in the regular learning practice of two years and thirty-five days ago is repeated here. Curve 1 is the regular learning curve and 2 is the memory curve giving the results of the test just completed.

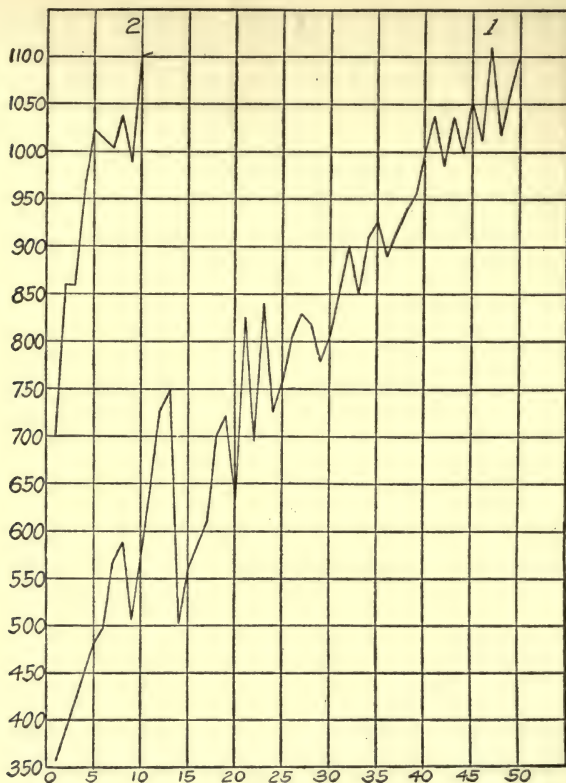
As will be seen from the curves the original investigation covers a period of fifty days, while in the memory test only eleven days were required to reach the degree of proficiency with which the original investigation closed. As a matter of fact practice was omitted on five of the fifty original practice days and once during the memory test. The actual number of days of work was therefore forty-five in the former and ten in the latter. In both cases Sundays were omitted.

The length of each day's test was one hour, as in the original in-

¹'The Acquisition of Skill in Type Writing; a Contribution to the Psychology of Learning,' PSYCHOLOGICAL BULLETIN, vol. I., p. 295.

vestigation, and the same typewriter was used in both instances. The number of words written during the hour is shown to the left of the vertical line and the days are given below the horizontal line.

In beginning the original investigation¹ the subject was able to finger out three hundred and fifty-five words during the first hour. In the present memory test, as will be seen from the curve, after an interval of two years and thirty-five days, the subject began the work



with the ability to write seven hundred words during the first hour, and in nine days of practice, work being omitted on one day when the subject was not in his normal condition, he regained the skill which he had acquired at the close of his regular practice of forty-five working days two years and thirty-five days before. The rapidity of ascent in comparison with the original curve, as well as the difference in the

¹ *Loc. cit.*

lines of direction of the two curves, are striking. Beginning with a score nearly twice that made on the first day of the original investigation the subject made a gain of one hundred and sixty words the second day. The failure to advance on the third day was partly due, at least, to the fact that the subject had attended a banquet the night before and was 'out of condition.' On the fourth day another advance of practically a hundred points was scored and fifty-eight on the fifth day. Here, at a score of ten hundred and twenty-three, the first real delay was met, but it was so near the subject's maximal record that it was not surprising. Five days were now needed to reach the permanent score of the original practice work.

From the start the subject wrote with a feeling of ease that was very different from the strain of the earlier work as shown by the notes for those days. During the first few days it seemed to be a matter of reëxcitation of nervous centers and of stirring to renewed activity habitual associations that had lain for the time dormant. There was a tendency to strike the keys quicker than at the corresponding time of the original investigation, and this brought increasing liability to error. One reason why this quicker movement did not bring greater rapidity was that the subject would repeatedly catch himself in the act of striking the letter adjoining the correct one, and recovery from this, with effort to find the right key, lost time. The fact that the fingers went without delay to approximately the right place shows that the old associations of muscular location were still ready to function at call, but slightly inaccurate. Indeed the whole process seemed to the subject to be the reinstatement of accuracy rather than the making of new associations. The nervous alterations that represent the physiological basis of memory evidently remained fixed during the intervening period and all that was needed to bring the old accuracy of discharge was a few days of practice. Besides the introspective evidence, which clearly showed this, the same thing is indicated by the rapidity with which the curve ascends. The same persistence of memory through long periods has been demonstrated by the writer¹ in keeping two balls in the air with one hand and by Bourdon² in various mental processes.

¹ *American Jour. of Psychology*, vol. 16, p. 131.

² *L'Année psychologique*, vol. 8, p. 327.

PSYCHOLOGICAL LITERATURE.

MEMORY.

Ueber das Gedächtnis für affectiv-bestimmte Eindrücke. KATE GORDON. Archiv f. d. ges. Psychol., 1905, IV., 437-458.

Bemerkung zu vorstehender Abhandlung. O. KÜLPE. Ibid., 459-464.

Miss Gordon's experiments were undertaken to determine if possible whether the pleasantness or unpleasantness of certain visual sensations has an influence on the *accuracy* of the memory of these experiences. As material the experimenter used series of colored figures, of simple symmetrical designs, which were shown to the subject for a certain length of time and then immediately described by him. The test of memory was the accuracy of this verbal description. Each figure was classed according to the introspection of the subject as pleasant, unpleasant, or indifferent, and also, because of unavoidable differences in the ease or difficulty of comprehending the several figures, as hard, medium hard, or easy. Each series was repeated after an interval of three weeks.

The conclusions were almost entirely negative. No real difference could be detected between the pleasant, unpleasant, and indifferent cases, either in accuracy of memory or in the per cent. of figures recognized when seen for the second time. The only difference observed between pleasantness and unpleasantness was a tendency to remember earlier experiences as pleasanter than they really were. This, in the writer's opinion, is the true meaning of the so-called 'optimism of memory.'

In discussing her results in comparison with those of other investigators, Miss Gordon draws a distinction between a direct and an indirect influence of affective tone on memory. She is of the opinion that although an affective tone cannot be proved to influence directly the reproducibility of an impression, yet by affecting the attention it does 'tend to bring about the conditions for an act of association.' It is not clear from the context whether the conclusion drawn in the clause just quoted is an inference from the experimental results or is an assumption based on general observation.

In a brief article following Miss Gordon's, Professor Külpe indi-

cates the most important results of these experiments. He points out that (1) the conclusions agree with a large group of facts, designated as the 'emancipation of the intellect and will from the feelings of pleasantness and unpleasantness'; that (2) the pleasantness or unpleasantness of an experience has no effect on the recognition of that experience. Pleasantness and unpleasantness as such are not sufficiently differentiated to serve as a clue for recognition.

In criticism of the experiments Külpe notes especially the fact that the method used for classifying the figures, according to the individual opinion of the subjects, introduces variations which are not taken account of in the results.

Another criticism of the experiments, not mentioned by Professor Külpe but one which seems to the reviewer to be of importance, is the fact that the very complexity of the figures necessary to produce any feeling of pleasantness or unpleasantness in the subject made it difficult to trace any direct influence of those affective values on the memory. Each figure *as a whole* had affective value for the subject, but it was the reproducing of the *details* of the figure which served as a test for the memory. From the outset, therefore, the real problem concerned the influence which the affective tone of a complex experience has on the attention to the details of that experience, and thus, indirectly, on the accuracy with which it is remembered. Miss Gordon does not seem to distinguish between the affective values of the whole and of the parts.

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Zur Frage über den zeitlichen Verlauf des Gedächtnisbildes für verschiedene Sinnesreize. GISELA SCHAEFER. Zeitsch. f. Psychol., 1906, XL., 55-73.

The author describes the outcome of a series of experiments designed to show the relative value of auditory, visual and tactile sensations for memory. The subject reproduced, at certain intervals, different time-periods transmitted to him by means of an incandescent lamp, electric bell or faradic shock. For auditory sensations, 43 experiments were performed, with 19 persons; for visual, 28 experiments with 23 persons; for tactile, 14 experiments with 11 persons. All persons experimented on were students, physicians or lawyers. The difference of sex does not show any effect upon the results of the experiments.

In summing up the results of the experiments, reactions are called correct when they show a more or less exact reproduction of the time-

intervals; they are called steady when the characteristics, shown at the beginning of the experiment, remain, more or less plainly, throughout its full length.

Of 43 auditory reactions 21 were more or less correct; of 28 visual and 14 tactile tests one for each class was correct. Correct reproduction of time-intervals, at the beginning of the experiment, appeared as follows: for auditory tests in about $\frac{2}{3}$, for visual in less than $\frac{1}{3}$, for tactile in less than $\frac{1}{4}$ of the whole number of reactions. The greatest number of correct reactions was found in the reproduction of intervals limited by auditory stimuli, the least number in that of tactile stimuli; this leads to the conclusion that the memory for auditory sensations is better than for visual sensations, and for both of these better than for tactile stimuli.

Of the remaining reactions, started correctly, some show an acceleration later on, and some become slower. All auditory and one half of the visual tests become more rapid; of the tactile $\frac{1}{3}$ accelerate, $\frac{1}{3}$ become slower and $\frac{1}{3}$ remain uniform, more or less.

The auditory experiments, which were started with an acceleration, continue to be so, in most cases; the same class of visual tests shows a still more decided acceleration. Of the tactile tests of this class, a little less than $\frac{1}{2}$ become more rapid, about $\frac{1}{2}$ remain uniform; in one case the reaction becomes slower. One cannot help noticing the comparatively large number (seven) accelerated at the outset. Of the experiments begun with a reaction slower than the signal, the most of the auditory tests show an acceleration later on; the same is noticed for $\frac{1}{2}$ of the visual and tactile sensations. Experiments started with accelerated or retarded reaction do not show any correct reactions later on, for any length of time. An extraordinary duration of the experiment does not affect the result in $\frac{1}{2}$ of the visual, and in less than $\frac{2}{3}$ of the tactile tests. In other cases, a more or less sudden acceleration or retardation takes place, which may be interpreted as the effect of fatigue.

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REACTION TIME.

Ueber die Willenstätigkeit und das Denken. NARITZ ACH. Göttingen, Vandenhoeck u. Ruprecht, 1905. Pp. 249.

This is an attempt at an analysis of the will by means of the ordinary reaction experiments, and especially by means of the introspective reports of the subjects. This of course raises the question of the

validity of introspection as a psychological method. The author in the beginning goes to some length in an attempt to justify it, sensibly in the reviewer's opinion, on the ground of the 'Perseverationstendenz,' which is discussed at some length in G. E. Müller and Pilzecker's study of memory. By this 'Tendenz' is meant the actual persistence of a mental experience or experiences, so that they can be examined in a later moment in their proper order of sequence. This 'Tendenz' is intensified by attention. Though the author does not expressly say so, he might have urged that it obviates, to some extent at least, one objection that is invariably brought up by the opponents of the method of introspection, namely, that it is no more reliable than memory itself. Of course the author assumes — and his opponents may say that he does so without warrant — that the experiences reported by his subjects are those which have persisted from the preceding moments and not something entirely different.

The usual reaction apparatus and methods were used in these experiments. The stimulus was always visual: cards variously colored and marked. Both operator and subject were seated in the same room — an irregularity which could not be avoided without giving over the method of verbal reports of introspections or using telephonic communication which proved distracting. All experiments were performed without knowledge and the subjects were without experience in psychological experiments. But 39 days were occupied with the work and only 218 experiments were performed; an unusually small number to form the basis of such a volume of discussion. The author makes no claim, however, to the statistical value of his work. The subject received the usual instructions to direct his attention in preparation for sensory, muscular, recognition, and discrimination reactions.

The character of the sensory and muscular sets and the reports of the observers lead the author to conclude that there is not sufficient ground for Lange's division of reactions into sensory and muscular types. It was the unanimous testimony of his subjects that the mere perception of a card was sufficient in the muscular series to occasion movement, and that in the sensory series there was no standard of clearness of the perception of white, *e. g.*, on which the movement must follow. No subject was sure that he invariably reacted upon the same phase in the development of this perception. In the course of practice the time of sensory approximated that of muscular reactions. Furthermore, in a series of experiments with 'surprise' stimuli in which the subjects were directed to react only to the white cards, they reacted not once but two or three successive times to a colored card. This occurred in

both sensory and muscular series; a contradiction of Lange's report that such reactions do not occur in a sensory series. This last leads Dr. Ach to believe that complete apperception of the stimulus has no more to do with sensory than with muscular reactions. The mere apperception of a change in the stimulus is sufficient to occasion the movement. On the whole he favors the Wundtian classification of reactions into retarded and accelerated forms. These forms are not determined by the direction of attention but by the purpose to react after the stimulus is clearly perceived or to react as quickly as possible.

But no argument of this kind will carry any weight with the disciples of Lange. If sensory and muscular times come together, they may say that the subject simply is not reacting sensorially at all. If a subject who has been directed to react after apperception of a blue card removes his finger from the key as soon as he is conscious that a change has occurred in the direction of the stimulus, he is not reacting sensorially and of course the time values will differ from those of Lange. If sensory approach muscular times they may say it does not signify a transformation of the sensory into the muscular form, but the gradual adoption of the latter and the exclusion of the former. Thus between Ach and Lange the question becomes one of definition.

No subject was able to report any experience occurring between the moment, of perception of the stimulus and the production of the movement, and hence the author concludes that there is no specific will impulse. The entire process of preparation with the final 'Now I must move,' is identical with will.

The author follows his treatment of the forms of reaction with a discussion of sensations of intended movement localized in the eyes, which indicate the direction of the subsequent movement though it does not necessarily follow. These sensations appear to be of central origin, he says, since they are present even in subjects made anæsthetic by hypnosis. But in the reviewer's opinion he has added nothing to our knowledge of the will either in this or in his long discussion of 'reproduction tendencies' and 'determining tendencies' which can hardly be based securely upon the meager observations he has made.

The volume will be of interest to experimentalists mainly for its treatments of types of reaction.

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INTELLECTUAL PROCESSES.

Experimenteller Beitrag zur Psychologie des Urteils. ROBERT BÁRÁNY. Ztsch. f. Psychol., 1905, XXXVIII., 34-50.

Dr. Bárány investigated the problems that are involved in recognizing the vertical on the skin of the forehead. An apparatus was devised which would permit a line to be drawn upon the forehead at different inclinations. The most striking result of the experiments at first sight was that there was no regularity in the judgments that were made. The line seemed vertical over a range of ten degrees. Even more peculiar is the fact that in a series of experiments there is a tendency to displace the vertical now in the direction of change and again in the opposed direction, and the tendency in each series will be marked and regular. The author explains the opposed tendencies to error by the differing direction of the attention. When the attention is directed predominately to the original position, the line is not felt as vertical as long as there is any possibility of assigning the original inclination to it. When, on the other hand, attention is directed to the change to be expected the rod is said to be vertical when there is the least warrant for it. The error and the explanation are strongly suggestive of the well-known errors of habituation and expectation, but the reason assigned for the dominance of the one or the other is interesting and ingenious, and probably has applications in other fields.

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Counting and Adding. L. D. ARNETT. Amer. J. of Psychol., 1905, XVI., 327-336.

The aim of this study is to examine psychologically two of the simplest mathematical processes. The author accepts the Hall-Jastrow definition of counting as 'the matching or pairing or approximative synchronization of the terms of two series of events in consciousness,' the series of number names and the series of events to be counted. The experimental work in counting consisted in (1) the counting of a series of like visible objects and (2) of a series of irregularly recurring clicks. In the first series it was found that, beyond a mean distance, speed and accuracy decreased with the increase in the distance of the objects from the observer; that speed increased in counting by groups, ones, twos, etc., but less rapidly as the groups increased; that accuracy was greatest when the counting was by twos and fours. In counting the clicks 'the difficulty lay in coördinating the inner series of number

names, which was a simple and uniform advance with the procession of clicks,' which was irregular. "The point of interest in this experiment is the emphasis which it places upon the simply rhythmic character of the automatic inner series." "The psychical counting mechanism . . . is so arranged that with a proper succession of . . . excitations to action it will bring forth its characteristic series of numerical symbols." An important, perhaps the chief, element in these excitations is voluntary movement. The process of adding was studied (1) in the adding of columns of figures, and (2) in the timing of the addition of pairs of numbers. (1) Some observers simply added digit to digit up the column; others formed combinations of the figures lying just ahead. The combinations equaling 10 were most frequent. 'The tendency in grouping seems to be to add primarily by tens, then to add by nines which is ten less one,' etc. Errors seem to be caused by the influence of preceding figures delaying in the mind. The poor adders seek easy combinations; the best use a few combinations judiciously. "The trained apprehension of the sum of two digits is a process not unlike the recognition of the proper pronunciation of a word." (2) The experiments on the rate of adding seem to indicate that 'the sum was reached by an association which seemed practically as simple as that of reading.' The slowness of adding to the larger numbers is probably due to the difficulty of enunciation. Some of the introspective dicta, such as the difficulty of adding odd numbers and the transposition of figures to bring the larger digit first, are not supported by the chronoscope.

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FEELING AND EMOTION.

Das Gefühlsproblem. ROLF LAGERBORG. Leipzig, Barth, 1905.
Pp. 141.

The problem of feeling is here attacked along the lines suggested by the James-Lange theory of emotion. Back of this lies the more general conception, that consciousness is in all cases due to the repercussion on the sensorium of reflexly excited bodily reactions.

The work has five main parts. Part I. seeks to confirm the preliminary assumption, that the basis of feeling is found in peripheral processes, by a comparison of feeling with attention. Attention, it is claimed, has been shown by recent study to be always, psychically, 'a *Totalempfindung* of peripheral and particularly motor reflexes,' a result supported, it is said, by the peripheral theory of the sense of

effort. Now certain feelings, such as effort and fatigue, resemble attention in that they too are evidently determined by peripheral conditions; indeed, according to our author, they differ from attention chiefly in containing more prominent visceral elements. Some feelings may even be defined, he thinks, as forms of attention; interest, *e. g.*, as an intensified, pleasurable toned attention, anger as a suddenly intensified attention with internal disturbances, etc.

The comparison seems to assimilate attention to feeling rather than feeling to attention. It leaves altogether out of account the characteristic phenomena of the latter, namely, the correlative focalization of the object and intensification of our awareness of it, and reduces attention to the feeling of attending.

It should be noted in passing that, in the author's opinion, the term 'feeling' should be applied only to the obscure non- or ill-localized sensations of 'common sensibility,' together with pleasantness and unpleasantness, and should not be used of compound states, like emotions, taken as a whole. This is a matter of definition, and, in the writer's opinion, one not to be recommended.

Part II., which is historical, contains an admirably lucid review of recent discussion of the James-Lange hypothesis. Lehmann's experiments, in particular, are acutely criticized and shown to be ambiguous.

Part III. treats of the mechanism of the affectional organic processes. The important visceral reflexes and part of the motor expression are referred to subcortical centers, but the nature of their stimuli is held to be obscure. The author adopts, in general, the principle of 'excess discharge.' The theory of the primacy of the vaso-motor reflexes is disputed; the different reactions are held to be mutually interdependent. This interdependence is explained as due to the irrigation of the blood as well as to association of the centers. The author further holds that the sequence and interaction of the organic changes are probably different in different cases, and that these variations are reflected in the total psychical impression. The theory criticized, however, suggests a nutrition hypothesis for pleasure and pain. This subject is discussed at length in Part IV.

That pleasure and pain are intimately connected with nutrition is implied, the author thinks, in the commonly accepted theories of these phenomena; the fact itself is illustrated in a number of examples. Can this idea be made more precise and probable as a general hypothesis? From an examination of the processes known or conjectured, first in fatigue and, again, in physical pain and in sensual pleasure (*Wollust*), and from

a comparison of these with unpleasantness and pleasantness, the author concludes that it, to some degree, can. He connects all these phenomena with specific processes of nutrition, more especially with the action of the toxins. Thus fatigue is conjectured to be due to a mild, the algedonic sensations to an increased or otherwise characterized intoxication. Pain and unpleasantness are connected with the action of the toxins formed, sensual pleasure and pleasantness with the return to the normal condition. Though the physiological mechanism is different, like processes of stimulation are believed to underlie both pain and unpleasantness; and similarly of sensual pleasure and pleasantness. The nutritive processes conjectured as the bearers of the algedonic sensations are included under the peripheral reflexes set up by unusual stimulation.

The general theory, then, is as follows: feelings are repercussions on the sensorium of extensive peripheral and, particularly, nutritive reactions, the latter influencing the quality of the blood and other fluids and inhibiting or promoting nutritive processes in the capillaries. Part V. discusses the nature of the irradiating stimuli which bring about these reactions, and also the process of the irradiation. The stimuli, it is held, are in all cases, in pleasure as well as in pain, excessive, abnormal, at any rate ill-adapted, relatively, that is, to the existing disposition. The irradiation is represented as essentially a process of adaptation, the breaking into new paths when the old paths of habit are insufficient. The feeling is dulled with repetition. Hence it 'is only an episode on the way taken by excessive stimulations to the full discharge in an act.'

In a 'Conclusion' the author extends his peripheral theory to the will and to consciousness generally. Will is resolved into psychical correspondents of motor reflexes and consciousness into a passive epiphenomenon of the processes set up conjointly by the stimuli and their bodily reactions.

In spite of its acuteness and learning, the argument leaves the reader unconvinced. The truth seems to be that we have no evidence in regard to feeling sufficient as yet to warrant more than rather vague working hypotheses. The author has given us one, and it should be tested. At present his nutrition theory seems to be a rather large superstructure erected on a highly conjectural foundation of fact. If the 'motor' or 'action' theory of consciousness, which the author mistakenly identifies with his own, should come to be established, the part played by the repercussion of the somatic excitement along afferent paths would have to be reinterpreted. If Sollier should succeed in

working out his doctrine of cerebral cœnæsthenia, the peripheral theory, as here presented, would have to be abandoned. And if Meining's *Phantasiegefühle* should come to be accepted as affording an exception to the law of dulling by repetition, the conception of feeling based on that law and, by parity of reasoning, of consciousness generally as only an episode in the process of organic adjustment, would have to be at least modified. All the main results of the work, therefore, seem doubtful. Nevertheless the book is an extremely able and instructive one, and no student of the subject can afford to overlook it. It is a small book, but its pages are packed.

Sur les abstraits émotionnels. L. DUGAS. *Revue philos.*, 1905, LX., 472-485.

Emotions, according to Ribot, become general or abstract either by the fusion of particular emotions, or by sharing in the generalization of the ideas they accompany. Dugas disputes this account. It is a prejudice, he thinks, to suppose that the process of intellectual abstraction is understood independently of feeling and that we have only to reason from the former to the latter by analogy. He contends that general ideas are themselves regularly formed, as Ribot admits that they are in exceptional cases, not by 'fusion,' after the manner of a composite photograph, but by a mental synthesis based on a sentiment, an interest. As to the generalization of the sentiment itself, it is brought about, he holds, in two ways; first, by its persistence in unfavorable circumstances, which yield it no proper satisfaction; second, by its persistence under favorable circumstances, by which it is enriched and developed. As an example of the former we have deceived and unrequited affection, where the feeling is said to be abstract, in that it is 'simplified'; of the latter, youthful passion passing into the purified sentiment of union, 'love in general' being the 'law' which unites the passion to the tenderness, or the 'nature' traversing the various stages of its evolution.

Any contribution to the vexed question of 'emotional abstracts' is welcome, and the present one is certainly not the least valuable and suggestive in the recent literature. But before any progress can be looked for, it is before all things necessary that some attempt be made to define precisely what the term means and to point out the various classes of facts for which it stands. When, therefore, is a feeling 'general' or 'abstract'? When it is conceived in respect to that which is fundamental and profound in it, replies Dugas. But is this what Ribot means when he speaks of the general emotional impres-

sion left on the mind by a visit to a monastery or by travel in a foreign country? Or are we to regard such general impression, with Saxinger, as a *Phantasiegefühl*, and distinguish the latter from the 'emotional abstract' proper? The whole subject seems full of obscurity. Dugas' own illustrations suggest two classes of abstracts; but while the first may be admitted as a psychical existent, the second looks suspiciously like the product of a psychological abstraction due to reflection on a connected mental process from without.

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Experimentelle Beiträge zur Lehre vom Gefühl. G. STÖRRING.
Archiv f. d. ges. Psychol., 1905, VI., 316-356.

The purpose of the experiments is thus described by the author: "The investigation consists of experiments in which the pleasurable mood or tone (*Stimmungslust*) is sharply distinguished from the pleasure sensation on both its objective and subjective sides. I have induced the pleasurable mood experimentally and have contrasted it with pleasure sensation by an examination of its subjective psychical characteristics and of its objective characteristics as indicated by the pneumograph. I have sought to define unpleasant experience with the pneumograph. And, lastly, I have made experiments with the dynamometer which investigates the relation between feeling and will from a new point of view."

In view of the difficulty of accurately comparing moods which come in the ordinary course of experience, at more or less widely separated times, the author used for investigation the pleasurable mood ensuing upon swallowing a solution of agreeable taste, and contrasted it with the pleasure sensation experienced while the solution was in the mouth. To give a definite content to consciousness the subject performed work on a dynamometer during the experiment. The two sorts of feeling were found to have the following subjective differences. The pleasure sensation is a discrete part of consciousness, confined to the taste presentation, distinct from other contents of consciousness, from which the attention needs to be forcibly abstracted to begin work on the dynamometer. The mood, on the other hand, is diffused, it colors and amalgamates itself with all the content of consciousness, producing a widening of the field of consciousness and a freeing of the attention. The sensation of pleasure, moreover, declines during the experiment, while the mood does not. It should be said that the subjects of these experiments were trained psychologists.

Some marked objective differences were also found by means of the pneumograph. The author calculated the height, general level and frequency of both the thoracic and abdominal curves. For weak and moderately strong pleasure sensation he confirmed the finding of Zoneff and Meumann. The frequency of the breathing curve increased and the height diminished. For strong pleasure, however, the height of the curve also increased. As a result of the pleasurable mood, on the other hand, the frequency diminished, while the height increased for all degrees of strength. The abdominal curves varied in general with the thoracic. The curve level (niveau) showed no uniform variation.

The frequency and height of the curves during very strong unpleasant sensation showed great individual variations. All the subjects agreed in noticing very strong active tendencies, which, however, seemed to find an outlet in different reactions. The one factor which varied uniformly was the quotient of duration of inspiration over that of expiration, which diminished regularly.

The motor results of unpleasant sensations were measured with a dynamometer. The subjects preceded the contraction of the dynamometer successively by simple or undefined, by sensory and by motor preparation of the attention. Though sensory preparation seemed to be accomplished more easily and completely, the succeeding contraction did not show a correspondingly marked increase in intensity. This may, however, have been due to the imperfection of the instrument, for which the author intends in future experiments to substitute an ergograph. All the subjects of the experiment experienced a feeling of pleasure at the beginning of motor accomplishment, but the author concluded that this was not the cause of the increase of work performed. This increase was marked during unpleasant sensations for all three modes of preparation. The determination of the relative effect of the motor and the sensory preparation was prevented by the imperfection of the recording instrument.

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Le Sourire: G. DUMAS. Rev. Philos., 1904, LVIII., 1-23, 136-151.

In attempting to account for the expression of emotion, Spencer set forth the *Law of general diffused discharge*, a purely mechanical law which he formulated as follows in the Principles of Psychology, II., § 497; "Other things being equal, it [the diffused discharge] af-

fects the muscles in the inverse order of the sizes and weights of the part to which they are attached; and by so doing yields an additional indication of its quantity." This mechanical principle accounts, for instance, for the wagging of the tail in the dog and for the movement of facial muscles in man, in response to slight stimulation, but it does not explain why, in the case of the smile, only some of the facial muscles, and not all of them, are innervated. In order to provide for an adequate understanding of this and of other emotional expressions, psychological principles have been added to the mechanical ones. Darwin made use of the principles of serviceable associated habits and of antithesis, and Wundt of the principles of the association of related feelings and of the relation of the movements to sense representations.

Without at all denying to consciousness a rôle in the establishment of many emotional reactions, Dumas, unlike his predecessors in this field, is of the opinion that the original smile-reaction does not go beyond the purely mechanically conditioned. In the first of these two papers the author sets himself the task of showing, without going beyond physiological mechanics, why a moderate excitation, which, according to the law of Spencer, should affect all the facial muscles of equal weight, innervates only some of them, and thus produces the smile.

A careful examination shows that a complete smile involves the coöperation of 15 of the facial muscles, and that these muscles coöperate with each other, or at least that they do not oppose each other; while the other muscles neutralize each other or are neutralized by the contracting muscles. This means simply that the smile is the easiest movement of the face; it is a reflex, albeit a somewhat complicated reflex.

Whether the smile is due to purely mechanical forces or not, Dumas has made an important addition to the principles explanatory of emotional expression in taking into account the dynamic relation existing between the muscles, instead of considering them, as his predecessors had done, only in their isolation.

The fact that the facial muscles serve to express other moderate feelings than those manifested by the smile, as, for instance, a slight anger, may seem to some an argument against the sufficiency of Dumas' explanation of the smile. If a weak stimulation can result in different facial expressions, then the purely mechanical principle is inadequate. The answer of Dumas would be, I believe, that it is inadequate as regards anger. The facial movements observable in slight anger are to

be looked upon as the beginning of the full-fledged anger-expressions which may be satisfactorily accounted for on the Darwinian theory of chanced variations established because of their usefulness in the struggle for life. If thus accounted for, anger falls under different laws from the smile. At this point the remark will no doubt be made that there is as much reason for considering the smile as an attenuated laughter as there is for regarding certain expressions of displeasure as the first degree of anger. Dumas, however, is not of that opinion. In his first paragraph he affirms that if the smile is in certain cases the first degree of laughter, it is not always so; "it is frequently connected, without intermediary link, with the deeper laws of expression and of life." This occasional independence of the smile from laughter is a point which, it seems to us, demands further elucidation.

Dumas did not rest satisfied with the considerations and the observations we have indicated, he sought an experimental demonstration of his conclusions. With the collaboration of Dr. Dupont of Saint-Anne, he attempted to reproduce the smile by the electrification of the facial nerve. Of the four photographs which he gives us, only one may be said to reproduce a real smile. But, even though his experiments had been more successful than they were, they could hardly have been held conclusive. For, whatever may be the origin of the smile, when once established, it has become a psycho-physiological habit. One might then, it seems, expect a mechanical smile-response to a mild stimulation of the facial nerve, even though it were not the easiest movement of the face. Moreover, again, because of this habitual character of the smile, one might suspect a more or less unconscious completion of it when some of the muscles involved in a normal smile are mechanically stimulated.

In the second paper Dumas undertakes to show how this mechanical facial response to a moderate stimulation has become "the most social of all our expressive gestures." The reason of this is found, we are told, in the fact generally admitted by psychologists that moderate stimuli are pleasant. "It is therefore natural that the hypertonus expressing originally nothing more than the stimulation of the facial should have been early considered a sign of moderate joy, of pleasure, and that this purely physiological play of features should have spontaneously assumed a symbolic meaning."

The rest of this part is given up to a very subtle analysis of the varieties of the smile and, in particular, to the differences existing between the smile of laughter and the smile of pleasure.

JAMES H. LEUBA.

La rôle des sensations internes dans les émotions et dans la perception de la durée. D'ALLONNES. *Revue Philos.*, 1905, LX., 592-623.

M. D'Allonnes discusses the case of a patient who presented herself voluntarily at the hospital of St. Anne, Paris, complaining of a loss of emotions and of the lack of the sentiment of the passing of time. Peculiarly enough, moreover, at the very moment the patient complains of not feeling a certain emotion, she displays all its outward signs: all the apparent conditions of the emotion, intellectual and physical, subsist, and their coördination to actual circumstances is normal. Upon careful examination, she was found to suffer from a complete visceral anæsthesia, existing in a state of comparative purity, with no notable complications of visceral paralysis or of important anæsthesias either of the external senses or of the movements of relation. The skin, though insensitive to pain and thermal stimuli, was very nearly normal in regard to tactile sensations. The internal sensations and those of pain and temperature were lost at the same time as the emotions and the sentiment of time: and since the patient does not show the symptoms of a victim of a fixed idea, the only adequate cause of the disappearance of the affective states is the profound visceral anæsthesia. We thus see the affective sensibilities to lie in the visceral, pain, and temperature senses, as distinguished from the non-affective sensibilities of the specific external senses, and the tactile and muscular senses.

In the case of this patient is seen a clear separation of three sorts of time: First, the intellectual conception of time, which is intact; second, the affective sentiment of the lapse of short periods, from less than a minute to several hours, which is wanting; and third, immediate sensory-motor perception of time, as in rhythm, which is here merely enfeebled. The conclusion is that the feeling we have of actually living out the medium periods of time is conditioned by the internal sensations, in the heart of each one of which our physiological history of the past few hours persists in the state of tenacious affective impressions, whose vibration is not yet extinguished.

An interesting observation by the author is that in the absence of the affective nucleus, without which the emotion ceases to exist, *i. e.*, the internal sensations, there still remains a residue of sensations and ideas which systematize themselves into what are termed inclinations. The inclination is the residue of an emotion despoiled of its affective kernel. It is constituted by the sensations of external movements of relation and expression, by specific sensory data, memories, ideas,

judgments, and reasoning — the whole susceptible of tenacity and systematization and of exteriorization by words, by expressive movements, and by acts, in the absence of all emotion.

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VALUES.

Zur Frage der Wertbestimmung. E. DÜRR. Archiv f. d. ges. Psychol., 1905, VI., 271-288.

Before examining three definitions of value as felt, Herr Dürr shows the validity of a scientific treatment of feeling. The objection that 'the theoretic aspects deal with the knowledge of things, while the practical aspects are concerned, not with the essence of things, but with our attitude towards such things' can scarcely hold. For if we consider that 'feelings are effects of determinate causes like other occurrences, they too can be subject to scientific treatment.' Moreover, 'the knowledge of the causation of feeling, and reflection on the feeling, still remains a function of cognition, and its relation to the essence of things cannot be inferred from the subjectivity of feelings' (p. 272).

Three definitions of felt value are then thoroughly discussed by Herr Dürr. First of all Kreibig's definition of value as 'in general a meaning given by feeling' is taken up. By value we mean, according to Kreibig, 'the signification which a perception- or thought-content has by virtue of its immediate or mediate connection with a feeling, actual or potential'¹ (p. 273). But as Meinong has shown,² many objects which may be considered of value do not excite a feeling of pleasure. The fact that a non-existing thing may have value, that some non-existing cause may excite pleasure, shows the falsity of the identification of pleasure-pain and felt value. If we bring up as an objection the impossibility of a non-existing cause operating to produce feeling, we only emphasize this fact. Even if we consider that in so-called non-existing objects the idea of such objects is the real basis of the value felt, we have in such a case the thought of the object felt as valuable. This will make all psychic processes the direct objects felt as of worth. Not only a non-existing object therefore, but the thought of such an object, may be the cause of a pleasure-pain feeling, and so

¹ Kreibig, *Psychologische Grundlegung eines Systems der Werththeorie*, Wien, 1902, p. 12.

² Meinong, *Psychologische-ethische Untersuchungen zur Werththeorie*, Graz, 1894, p. 16 ff.

Kreibig's definition does not hold (p. 273). Kreibig must face the dilemma of having either a non-existing object acting as a cause, or the thought of such object operating to produce feeling.¹

The solution of this dilemma Herr Dürr sees in Meinong's explanation that the cause and the object of a feeling do not necessarily coincide. Very often the object of a pleasure-pain feeling is the felt value in question, while the immediate cause of the feeling may be something insignificant (p. 274). It seems that Meinong makes a distinction between the exciting cause of a feeling and the 'objective' of this feeling. No illustration is given to make this conception more clear. As far as I can make out the situation in question, some aspect of a given situation giving rise to a feeling of pleasure stamps the entire totality as of worth. For example (I hazard this illustration on my own responsibility) the color and position of objects in a painting may give the owner a feeling of pleasure, while the objective of such pleasure may be the fact that he has this picture all for his own use. The pleasure excited is directed to something other than the exciting cause.

Meinong furthermore differentiates ideation feeling from judgment feeling. The former presupposes some idea, while the latter in addition demands a judgment; and all feelings of value are judgment-feelings, *i. e.*, they are referred to an affirming or denying existential judgment as their psychological cause. Against this view Herr Dürr brings the case of the æsthetic judgment which has to do solely with a presentation, regardless of judged existence or non-existence; and also those cases in which presented objects excite in us feelings of value, not because of their abstract existence, but because of their power to excite in us feelings of pleasure. Moreover, Herr Dürr does not see how an object psychologically is different from its existence. Not only are there individuals who take pleasure in an object without being able to conceive of the value of its existence as such, but there are also examples in which possession is a factor in felt value. Consciousness of possession is something other than judgment of existence, and it, too, has bound with it feeling of worth.

To the third view of felt value we are introduced by von Ehrenfels' 'modification' of Meinong's definition. The function of judgment in the formation of existential feeling seems to the former to be a

¹ Is not Meinong here greatly in error? Is there not a confusion as to what constitutes the 'object' of thought? There is no such thing as an abstract thought. The object as non-existing is represented by a word which for purposes of reaction, etc., serves as well as the thing itself, or almost as well, and therefore, as a representative and present object, may be felt as of worth or value.

mediated one since it is determined by a certain degree of clearness and vividness of the ideas concerned. This, however, would make every idea a possible object of such determination, and therefore a possible basis of an existential feeling. If this is so, then every feeling can be an existential feeling, and as a determining factor, therefore, it loses its value. There will then be no difference between Meinong's ideation feelings and his judgment feelings.

Von Ehrenfels advances a theory of his own which is the last one which Herr Dürr discusses. Feeling of value according to the former is that feeling which is roused by the highest possible degree of clearness, vividness and completeness in the idea of the existence or non-existence of an object. Von Ehrenfels defines the worth of an object further as its desirability. Value is a relation between an object and its subject. The subject either actually desires the object or would desire it were its existence proven¹ (p. 280). Against this view Herr Dürr puts the question whether we desire what has value, or whether everything we desire has value on that account. May not that for which we strive as having value prove to be worthless, *e. g.*, sour apples with a pleasing exterior? Moreover, many things which we actually possess have value for us.

Herr Dürr concludes that desire and felt value have no connection and closes his discussion with his own definition. "Value is everything on which a feeling of pleasure depends" (p. 283). "It is everything to which a feeling of pleasure relates, or to which we know it can relate" (p. 287). Value is felt under the following conditions:

1. Through causal relations of an object to feelings of pleasure.
2. Through conviction of the existence or non-existence of a thing, situation or event which causes pleasure.
3. Through a mere assumption that the existence or non-existence of things, situations and events is bound with pleasure.
4. Through the idea alone of a thing, situation or event which rouses pleasure.
5. Through the conviction or assumption merely that possession of a thing or situation is bound with pleasure.

As examples of the first class we have the various agreeable and useful objects; of the second, the well-being of friends and relatives; of the third, metaphysical values as world systems, and the like; of the fourth, works of ideal and artistic nature; of the fifth, egoistic desires and strivings.

Now it seems to me that, thorough as Herr Dürr's presentation is,

¹ Chr. von Ehrenfels, *System der Werttheorie*, Leipzig, 1897, p. 65.

in his own definition of value he does not go far enough. It is too indefinite and from the psychological standpoint rather formal and without content. Pleasure depends upon a number of things, subjective and objective, upon the relation of the one to the other, upon the relation of the subject to himself at times. Even if this pleasure relation is known, it cannot help us as regards the constituents of felt value, as a psychic moment. As far as I can see, the definition of von Ehrenfels comes nearest to the facts in the case, but we can push his analysis back still further. There can be no question as to the existence of desire in some cases of felt value, or as to the fact that, as Herr Dürr points out, in possession of things felt as of worth desire cannot enter. Von Ehrenfels' definition is therefore only partially correct. What is the truth in the matter, it seems to me, is that motor reactions are at the basis of both desire and felt value. Hindrance due to lack of possession will give rise to a feeling of desire. Tendency to go through a series of reactions, which exists both in desire and feeling of worth, gives this feeling of worth. Where there is a hindering of complete serial explication, feeling of desire arises. Thus desire is present where the worth of nonpossessed objects is felt. The cause of such tendency to motor reaction is, as Herr Dürr suggests, either pleasure felt to be connected with the object, or known to be so connected. Pleasure includes feelings of satisfaction after reaction, etc. Where a given situation has yielded pleasure, there will exist a tendency to produce such situation once more. The object or objects concerned, either as means or end, will therefore be felt as of worth, such feeling existing as a felt tendency, a motor or body attitude, an impulse serially to react on the object or objects in question. Motor control, it seems to me, is the basis of feelings of value. If we are mistaken in our attitude towards an object, *e. g.*, the sour apples above mentioned, the apples in the first instance felt as valuable (the visual apples) are not the apples which disappointed us (the gustatory and motor apples). We must not confuse felt value, *i. e.*, subjective value, with objective, or social or average value.

FELIX ARNOLD.

NEW YORK CITY.

ÆSTHETICS.

Psychologie und Pathologie der Vorstellung. Beiträge zur Grundlegung der Aesthetik. RICHARD WALLASCHEK. Leipzig, Johann Ambrosius Barth, 1905. Pp. x + 323. M. 8.00; gebd. M. 9.00.

“The older view of esthetics treated objects, and therefore had

only a subjective validity; we (*i. e.*, R. Wallaschek) intend to discuss the perceiving subject, and hope thereby to reach an objectively valid standpoint.

"We need not necessarily restrict ourselves to the influence of works of art. All pleasures, even those of the so-called lower senses, must be included in the field of esthetics, insofar as they are considered as such, and not incidentally. * * * The author does not wish to offer a fully developed system of esthetics. Sensation, feeling and judgment would have to be considered in a manner similar to the treatment here given of the 'idea' if an independent and complete branch of knowledge were to be presented" (pp. iii, iv).

These few words of the introduction lead us to believe that we are to glide into the regions in which high and low art are to be appreciated, and we run over the table of contents. Here, however, esthetics takes a back seat, and indications seem to point towards a more or less psychological discussion. The various divisions¹ with the numerous subdivisions (there are over 150 of them), lead to the suspicion that the discussion is to be given in pieces, especially after the acknowledgment of the author that he is covering only part of the field of esthetics. On reading the work this suspicion becomes a strong belief. I may therefore take for granted the liberty of picking out the good parts, in piecemeal fashion, picking at the less good parts, in piecemeal fashion, and gathering together a few comments, in piecemeal fashion. For in this I shall but follow the author.

The good parts are all in the former half of the book, and are more psychological than esthetic. They deal for the most part with speech, song, reading, and writing, with a very brief and systematic presentation of the different pathological cases involved. Throughout this entire half there is an attempt made to work through and apply the modern conception of mental development as a process from a complete whole towards serial explication, a process of differentiation rather than one of integration. "Even in the beginning of purposive expression of feeling and will, we see that the single sound, the single movement, represent much more than a single word in developed speech, more even than a whole sentence. The psychic disposition which leads to the expression is much richer. When a child calls

¹ The contents are: Part I., 'Mental Expression and its Diseases.' I., Speech; II., Song; III., Reading; IV., Writing; V., Mimicry, Gesture, Action; VI., Explanation of the pathological cases thus far presented. Part II., 'Inner Mental Life; Nature and Succession of Ideas.' I., Nature of the Idea; II., Association of Ideas and Sensations; III., Memory; IV., Natural and Artificial Diseases of the Idea; V., Natural and Artificial Sleep (Hypnosis).

'Mama,' he has more than a mere presentation of her. If he were to give full (verbal) expression to what at that moment is going on in his mind, he would have to begin a whole story, and as he also goes through some action, he would have to present a whole scene. The mental process which is going on within him, and which he wishes to express, would be somewhat as follows: I have noticed this or that, I am afraid of it, I need help, You have protected me so often, Take me and quiet me once again" (p. 5). In teaching reading, therefore, the method most in agreement with mental development is to present whole sentences with meaning to the children (such sentences to emanate from the children and not to be forced upon them) and to proceed by analysis to the word and the letter. In writing, a similar process takes place. We do not learn to write (*i. e.*, the best way) by adding letter to letter (as a psychic process). The mental disposition is concerned with some thought-whole which finds expression through writing, in serial order. In learning new movements, when we go through a series of disparate and disconnected actions, we do not by this means learn the new exercise, as a whole. The whole is something more than a chain-like arrangement of parts. For example, in learning to swim, it is much more profitable to imitate a good example and then, after a number of attempts at the whole exercise, learn its parts as a development out of this whole, than to begin in the reverse order. And so with music and other forms of expression.

Concerning the psychology of music, the emotional element is something different from the ideational, the one receding as the other advances. In fact, words in music have frequently little significance, as many operas bear witness.

Thus far, with the possible exception of a very full account of music and musical aberration, the esthetic seems to be even less than a subtitle. The psychological account, however, is good as far as it goes, but it does not go far enough. Herr Wallaschek still clings to the 'cerebral' treatment of the older psychology, though free from some of its atomistic implications; but he entirely neglects the motor side of mental life, the importance of the 'attitude' in meaning, interpretation, and the like. He often is in danger of straying into the right path, but he never does so.

This 'cerebral' tinge is evident still more in his treatment of ideation. As regards the 'nature' of ideas, we are presented with the usual division of the visual type, the motor and the auditory. Of these different types, the motor is of the most importance, so Herr Wallaschek affirms, especially in music. This division gives, it seems to

me, not the 'nature' of the idea, but rather the various *kinds*, and we have in such a classification the much prevailing confusion in psychology, between the connotation and the denotation of its terms.

In the treatment of the association of ideas and sensations, the 'cerebral' or associationist view is again evident, in Herr Wallaschek's 'discovery' of what he calls 'secondary' sensations. Secondary sensations are those which are revived by some original or primary impressions from without. For example, when a person hears a sound or tone he may, due to this excitation, see a color, such color being centrally excited (colored audition). This may happen in various combinations with the other senses. We may have tactile audition, olfactory audition, gustatory audition, etc. As an explanation of colored and other audition, Herr Wallaschek offers the theory that it is due to cerebral excitation due to blood diffusion. When an auditory excitation arrives, the blood vessels in the corresponding parts are so well supplied with blood that the diffusion spreads to neighboring centers (?). This *may* have something to do with the matter, but it can hardly be the whole cause. If Herr Wallaschek would stick to his first basis, *i. e.*, differentiation from an experienced totality, perhaps he would come nearer to the facts in the case.

He also tries to apply this theory of secondary sensations to an explanation of instinct. "Why does the cow avoid poisonous herbs? Is this instinct inherited from previous generations? It is a question, in fact, whether acquired experiences can be transmitted, and it is also a question how on earth an instinct operated for the first time. It is, however, certain that the cow which had the first experience, *viz.*, that the pleasure of eating was followed by death, could not have bequeathed this experience, and for want of proper expression could not have communicated it to its comrades in the herd. * * * When, however, the sight and the smell of the poisonous herbs revive secondary sensations of taste, of a kind and effect as if the herbs had been enjoyed, then we can understand why the cows leave them alone" (p. 191). Leaving aside any explanation by natural selection (the fool cows dying, and leaving those with more sense), or the fact that a fat, unwieldy cow kicking and rolling around is expression enough for the most obtuse of its fellows in the herd, I think Herr Wallaschek again leaves the psychological standpoint with which he started (differentiation of a total given) and reverts to atomistic and cerebral explanation.

It may be of interest to note the theory of memory which is presented. "If, then, the hypothesis is correct that memory is simply an inhibited reflex, held back by either impressions from the same sense,

or ones from other senses, then it would be easy to see that in consequence of the inhibition of certain nerve centers or paths, the trace of all previous sense impressions would become weakened. In such a case, a single new impression, or a single uninfluenced trace of an impression would become active as a reflex, since it would not be held back by any active connection" (p. 199). This view of inhibition, etc., is again a more or less atomistic (Herbartian?) standpoint, and again a neglect of the influence of motor adjustment at present so well presented in Münsterberg's *Aktionstheorie*.

The rest of the book is taken up with the abnormal excitation of ideas, sleep and hypnosis, presented in the same piecemeal fashion as that which has gone before. I fear I should go to pieces myself if I were to attempt any further selections (I have given all that is 'best' in the book), so I shall finish my piecemeal remarks by a few comments on the esthetic value of the book, which in this connection, is 'few and far between.'

The entire work of Herr Wallaschek is a good example of solipsism. While, no doubt, the existence of any given, esthetic or otherwise, requires the activity of some agent, still a study of the mental processes of this agent (psychology) is not enough if we are to consider the 'situation' in its totality. Some 'objective' analysis is necessary. So esthetics, if it is to be treated adequately, whether in part or not, must receive some objective and inductive consideration.

I wish to touch somewhat on the esthetic, though it is treated as a step-child or a needy relation by Herr Wallaschek. His hint in the preface, which I have quoted above, that esthetic appreciation has but subjective grounds, is a popular fallacy, and has been presented by Kipling in the following:

They builded a tower to shiver the sky and wrench the stars apart,
Till the Devil grunted behind the bricks: 'It's striking, but is it art?'
The stone was dropped by the quarry-side, and the idle derrick swung,
While each man talked of the aims of art, and each in an alien tongue.

Surely art and the esthetic will remain a 'conundrum of the workshops' so long as humanity is content to follow the opinions on this subject of short-haired women and long-haired men. Esthetics, however, as a study of certain aspects of given situations, is subject to scientific method as are other aspects. We know, for example, that certain combinations of color are pleasing, that certain positions of figures and groups in painting are necessary to produce pleasure, that the whole (*i. e.*, the figures, etc.) should fit a more or less geometrical outline, that certain arrangements of figures in statuary are necessary

to bring into relief the main figure, that certain general divisions are necessary in design, and so on. This and much more concerns esthetics. We can at least lay down minimum and restrictive laws.

If the subjective aspect is to be considered, we might speak of the psychology of esthetics, in which case we should restrict our psychological treatment to the mental states and attitudes produced by the esthetic features of different situations. A thorough study of the attitudes which go with the ideational content, other than the emotional disturbance, is I think a work which will lead to some valuable results in this field. The explanation of the subjective moments solely by means of atomistic compilation or cerebral mechanism is gradually slipping away, and needs to be supplanted by the more modern study of body attitudes and motor adjustments.

FELIX ARNOLD.

NEW YORK CITY.

ETHICS.

Principia Ethica. GEORGE E. MOORE. Cambridge, University Press, 1905. Pp. xxvii + 232.

Mr. Moore's book is characterized by distinctness of purpose, sharp analyses, and a good and readable style. The two fundamental distinctions upon which its main arguments rest are as old as Aristotle, but they are worked out with unusual thoroughness. The plan of the book is to criticise ethical theories considered erroneous by the author, using the fundamental distinctions as touchstones, and then to elaborate the considerations that render these theories merely plausible. In the course of the discussion many interesting problems come into view.

The first distinction is between the in-itself-good and the good-for, between the 'kind of things that ought to exist for their own sakes' and the 'actions that we ought to perform,' the author believing, quite properly, that the failure to keep constantly in mind this distinction is responsible for much confusion in ethical thinking and writing.

The second distinction is between the connotation and the denotation of 'good.' And the failure to bear it and especially the exact connotation of good clearly in mind, is held to give rise to the 'naturalistic fallacy,' which is the ethical fallacy *par excellence*, and consists in hastily asserting that good is or means pleasure, health, fullness of life, etc., when it is or means none of these, but only and always just itself, though some of them are no doubt good things. The motto of the book is Bishop Butler's pregnant tautology, Everything is what it is, and not another thing.

On the basis of these two distinctions Mr. Moore divides his discussion into three parts, the first dealing with what good is, and, more at length, with what it is not; the second with the rules of conduct; and the third with the discovery and discussion of the things that are greatly good in themselves. The introductory drawing of distinctions and Part I. constitute the main body of the book, as the author's main object, as stated by him, is 'the discovery and establishment of the fundamental principles of ethical reasoning, rather than of any conclusions to which they may lead.'

We have, of course, to agree with Mr. Moore that 'good,' *i. e.*, goodness, that which constitutes a good thing good, is not pleasure or any other thing, but just goodness, and there is much clearness of thought in his explanation of the misleading plausibility of metaphysical, hedonistic, and evolutionary theories, though his arguments do scant justice to the light thrown by evolution on ethics in recent discussions, his criticism being limited to Mr. Spencer. I find myself unable to follow him, however, when he argues that good is a simple quality, like yellow or bitter, discernible but indefinable. He justifies his position by pointing out that 'good' must be simple, because in it no parts can be found. But neither can we find parts in 'fatherhood' or 'kingship' by scrutinizing the men who are fathers or kings, because, of course, their essence is not 'in' them as a quality, but in their relations to other beings, which relations are sufficiently complex. And similarly goodness is, I should say, just satisfactoriness, not satisfaction, nor any one quality in the satisfactory things or satisfied beings. If this view is correct some things are satisfactory because of one quality or group of qualities, others because of others, and goodness, like loveliness, desirableness, and, I should add, pleasantness, is not one thing to all men, or even to any one man at all times, but many things.

And this explains how Mr. Moore is able to say, 'I believe *the* good to be definable: and yet I still say that good itself is indefinable'; a term indefinable in connotation, while definable in denotation! He can, namely, pick out the essence, possibly even the goodness, of each group of good or satisfactory things, but he cannot discern the good qualities common to them all, for there are none.

These things are worth pointing out because, as the author is at pains to insist, and rightly, a scientific ethics, in addition to reaching right conclusions, is called upon to give right reasons for them. Good men accomplish the former, but only competent scientists the latter. Mr. Moore's conclusions in Part I. seem to me in the main secure and

valuable. The author may be mistaken in holding that the goodness of pleasure is not in its pleasantness, that of fullness of life in vitality, that of a good will in its chosen efficiency and wisdom; though, of course, each may on occasion be good for other reasons too. But he is assuredly right in maintaining that no one of these things is alone good, there being several classes of good things.

Passing over the judicious discussion of right conduct, we come to the main thesis of the last chapter, that the pleasures of human intercourse, and æsthetic enjoyment, are the two things greatly good, which is interestingly set forth at some length. Here the objection would seem to be to what is excluded, rather than to what is included. Surely other things are greatly good. If doubt exists, ask the camper about fullness of life, the participator in large enterprises about a steady and reasonable will, a clear and smoothly running mind, power efficiently exercised for a worthy object, or a worthy national chief executive about a well organized state in a rich country, peopled with worthy citizens. There are circles in these suggestions as must be the case if activities are to be included among our greater goods, and wise men have considered them, rightly I think, to be the greatest. But the alternative is to strangle life by logic, and count among human goods only emasculated passivities.

S. E. MEZES.

UNIVERSITY OF TEXAS.

Società e Ideale Etico. E. MORSELLI. *Rivista Filos.*, Nov.-Dec., 1904; Jan.-Feb., 1905.

What is the relation of the study of society to the ethical standard? Does it afford any light upon the respective values of the conflicting ideals — individualism and socialism — which compete for approval to-day? Spencer's individualism is not derived from his biology; indeed the conception of individualism is brought into union with the biological principle of adaptation to environment by an optimistic teleology like that of the orthodox economists. Neither is the individualistic goal which he foresees warranted by the course of society thus far. For society finds itself obliged to multiply rather than decrease its functions. Nor is it legitimate to confound, as Spencer does, individuality with independence. Individuality does increase with social progress; but this very increase means an increase of needs and hence of dependence. Wundt's theory of the will, presenting an ideal which subordinates the individual to the whole, is a legitimate development of German idealism. But both aspects of the theory, (1) that the will is the good, and (2) that the universal will, just because it is universal, is good, encounter difficulties if applied to

the test of social laws. For the complexity of social facts prevents us from making any one principle, such as pleasure, interest, sympathy, or even will, the single principle; and to say that the universal, purely as universal, is superior to the individual is to hypostasize the general in an inadmissible fashion.

On the other hand, can we dispense entirely with the conception of an ideal? Lévy-Bruhl in his suggestion that the old conception of the ideal must give place to that of a *science des mœurs* falls into an error the opposite of idealism. For to point out imperfections in conduct implies the conception of a higher type of social order. The doctrine of a *science des mœurs* also raises the question, treated by Windelband and Rickert, as to the uniqueness of the historic, and consequently as to the possibility of establishing any such science.

Positively, a study of society shows that both aspects—that of social dependence or the moral consciousness, and that of independent activity—are present as moving forces: the first, dominant in primitive society, the latter, soon emerging. And it is possible to find in present society growing recognition of both these forces. Thus socialism now claims that it is not opposed to individualism but rather affords the only true means for the realization of individualism. It maintains that Nietzsche, the individualist, ‘is one of us,’ for he believes in humanity, the great humanity of the future.

A correlate tendency, namely that of socialization in the camp of individualism, is indicated in the growing conviction that the individual can develop only by the aid of society. The aspirations for the various goods, material, intellectual, æsthetic, which are desired by the rising individual can be secured to him only by the protection of the state. The necessity of equality in privilege, the barbaric crudity of luxury, are other suggestions which social progress is teaching.

“The social regimentation is in contradiction with the laws of life. When we have comprehended this, can we hesitate?”

J. H. T.

DISCUSSION.

A NOTE ON COLOR-DISCRIMINATION IN THE CREEK CHUB.

Mr. Peterson, reviewing in the *PSYCHOLOGICAL BULLETIN* for May 15 (page 169) our study entitled ‘The Establishment of an Association Involving Color-Discrimination in the Creek Chub, *Semotilus*

atromaculatus,' says, "The experimenters conclude that * * * such 'successes' as the getting of food have powerful enough consequences to *guide*, but not to *inhibit* 'an animal in the performance of an instinctive action.'" He adds, "The positive part of this conclusion seems to have good grounds, but the negative is certainly founded on too meagre data." This criticism is based on an obvious misunderstanding of our statements. What we said was, "Experience involving pleasurable consequences in connection with one object and the absence of such consequences in connection with another object *may* be powerful enough to guide an animal in the performance of an instinctive action, but not powerful enough to suppress the performance of such an action." It never occurred to us to deny, in the face of the experiments of Möbius and Triplett, that experience may entirely suppress the biting instinct in the fish; we were pointing out that it also *may fail* to do so and yet be extremely efficient in the guidance of instinct.

It also puzzles us to conjecture what advantage would be obtained by experiments where food should be exhibited with both colors, as the reviewer suggests; inasmuch as all our conclusions regarding color-discrimination were based solely and entirely on experiments made with food in neither forceps, where, in consequence, the sight of the food was wholly eliminated as a factor.

MARGARET FLOY WASHBURN.

I. MADISON BENTLEY.

BOOKS RECEIVED FROM MAY 5 TO JUNE 5.

Les révélations de l'écriture d'après un contrôle scientifique. A.

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NOTES AND NEWS.

THE New Jersey Training School for Feeble-minded Girls and Boys, at Vineland, N. J., has established a department of psychological investigation. We are informed that work will be started along various lines, notably upon investigations analogous to those of Dr. Meyer at the New York Pathological Institute. The neurological work will be done at the Wistar Institute in Philadelphia, in co-operation with Dr. Donaldson. Henry H. Goddard, Ph.D. (Clark), has been called to the position from West Chester (Pa.) State Normal School. He will spend the summer abroad and enter upon his duties in September.

DR. K. DUNLAP, of the University of California, has been appointed Instructor in Experimental Psychology in the Johns Hopkins University.

THE following are taken from the press:

S. P. HAYES, fellow in psychology at Cornell University, has been appointed to take charge of the psychological laboratory of Mount Holyoke College, in place of Dr. Kate Gordon, resigned.

DR. CHARLES H. JOHNSTON, of the State Normal School at Stroudsburg, Pa., will fill the place of Professor H. H. Horne, of Dartmouth College, during the coming year. Professor Horne has been granted leave of absence and will spend the year abroad in travel and study.

PROFESSOR BIRD T. BALDWIN, Ph.D. (Harvard), of the West Chester State Normal School, will have charge during the coming year of psychology and educational psychology at Swarthmore College, where a new training school for teachers is being organized.

THE PSYCHOLOGICAL BULLETIN

THE FUNDAMENTAL FUNCTIONS OF CONSCIOUSNESS.¹

BY PROFESSOR HOWARD CROSBY WARREN,

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The recent discussions of fundamental psychological concepts, searching though they have been, seem to have missed a distinction of some importance. The term *function* has not yet been sufficiently defined and is applied at once to two very different sorts of process. I think it can be shown that memory, perception, imagination, and the like, are not operations *of the same order* as association and discrimination, for example, and that to class the two sets together creates confusion in our analysis. A careful distinction between them may throw light on the problem of function versus structure in psychology.

Where introspective analysis has failed, the genetic standpoint, which acts as solvent for more than one perplexing compound, enables the separation to be made, as it has brought to light an analogous distinction among biological functions. In the organic world certain processes are selective adaptations to environment and differ according to the species; others, more fundamental in character, run through the entire range of life and are essential to organic existence itself. Thus, in mankind, the locomotor and prehensile functions of the four limbs, the sudatory function, the circulatory function of the heart, are but particular types of function depending on particular forms of structure, out of many, more or less different, which appear in the various organic species, and which serve equally well to accomplish the biological ends of existence. The general functions of nutrition, reproduction, and defense, which work in many different ways and through many different organs, are operations of another sort altogether. The

¹ Read in part as a paper before the New York Section of the American Psychological Association, February 26, 1906, under the title, 'A New View of Mental Function.'

former are historic developments, while the latter are fundamental biological functions.

A similar distinction holds in psychology, though the parallel is by no means complete, owing to the different character of the sciences. A comparative study of mind shows that the processes to which, as it happens, most emphasis has been given in introspective psychology are merely special adaptations to the environment in which conscious beings chance to be placed; the same study, carefully followed out, will reveal, I believe, underlying these, certain *fundamental* functions which belong to the nature of mental life and to whose operation every phenomenon of consciousness can be traced. The purpose of the present paper is to distinguish between these two sorts of 'function' and to examine briefly the nature and rôle of the latter.

The usual systematic treatment of psychology lays too much emphasis on the particular senses. The analysis of the qualities, intensities, and mutual relations of sensations, important though it be from the psychophysical standpoint, is not one of the prime questions of psychology proper. That light and sound, for instance, are practically universal features of our physical environment, does not make vision and hearing essential mental functions. Even were these senses universal among conscious beings (which they are not), they could give no clue to the ultimate constitution of 'mentality.' The fact that we have visual and auditory experiences, instead of magnetic and what not, is a matter of psychophysical natural history only. The analytic psychologist should distinguish between the intrinsic characters of consciousness and the special forms and processes which it manifests. In making our analysis of the nature of mind the only questions which bear on sensory experience are, 'How does the mind come to have sensations (when stimuli produce activity in the brain)?' and, 'How do these sensory experiences come to differ (as the modes of stimulation differ)?' The assistance afforded by physiological research is sufficiently acknowledged in the second part of each question, though I believe the psychological investigation can be carried on without it. In any case, the analysis of particular sensation data has no bearing on the problem.

Similarly, the distinction between sensation and memory is solely a question of natural history. Experiences based on the central revival process and experiences based on sense stimulation present no other sort of differences than can be found among the various types of the latter. The gradual passing of sensation through after-image into memory-image, and the notable instances of confusion between sensa-

tions and memories, make it impossible to regard the processes involved as fundamentally different in character. The descriptive treatment of memory seems to belong naturally with sensation, or at least immediately after it — not after perception; the rise of memory requires no new function: simple memory experiences, as psychological data, result from the same sort of operations as sensation experiences.

Nor does the distinction between cognitive, affective, and conative 'sides of consciousness' or any other division along similar lines afford a satisfactory clue to the ultimate mental functions. For, while it may serve to demarcate certain distinctive classes of experience, the processes concerned in the *production* of these data are either psychologically equivalent or they are complex. That such a division does not rest on any *fundamental distinction in mental function* a cursory examination will suffice, I think, to show.

The conative side of consciousness in its simpler forms has been traced to kinæsthetic sensations with accompanying motor phenomena. The latter element is not an experience at all — it is purely physiological. And in the nature of the kinæsthetic sensations there is nothing fundamentally different from other sensations: muscle sensations differ from visual just as visual differ from auditory, if we consider the psychological aspect only. This does not lessen the peculiar importance of conative experience in determining some of the higher forms of consciousness (voluntary attention and voluntary activity); but it points to the need of another starting-point to explain this evolution.

Turning to affective or hedonic consciousness, the line of demarcation between feeling and sensation has never been drawn to the satisfaction of many psychologists, including the present writer. Admitting fully the distinction between physical pain (Schmerz) and unpleasantness (Unlust), I still cannot see wherein the Lust-Unlust experience itself is essentially different from certain other experiences which are classed as sensations or revivals — for example, the margin of the visual field and the temporal setting of memory-images. Whether the affective datum be regarded as an experience standing by itself (feeling) or as a character of experiences (tone), it is sensory in character: feeling can be attributed to systemic sensations; the hedonic tone of sensations is due to a margin or fringe of systemic sensations, and ideal hedonic tone to a memory fringe of the same sort. The distinction between affective and cognitive phenomena, then, is not psychological, but rests on a difference in the biological data: 'affective stimuli' are physiological processes, 'cognitive stimuli' are aspects of the physical environment.

Having noted the essential similarity of the conative and affective data to the cognitive, it remains to bring out the general relationship of the three. The distinguishing mark of cognition is its presentative nature; and for the most part the senses which offer this characteristic are the 'external' ones. The distinction between cognitive, affective, and conative consciousness can be said, then, to correspond in a general way to the difference between the external, systemic, and kinæsthetic senses: the first give experiences of the outer world; the second keep us in touch with the state of our own organism; the third supply experiences of the motor life and thus form the basis of voluntary activity. Whether I have drawn the limits exactly or not, the three-fold division rests on biological differences; psychologically, the differences separating the three classes of data are similar to other sensation differences; the three classes are therefore not due to the separate operation of three distinct mental functions.

A word is in place here on Brëntano's classification, which presents certain distinctive features. In the first place he groups feeling and conation together as phenomena of attraction and repulsion (*Phänomene der Liebe und des Hasses*); and in the second place he introduces a new class in the shape of judgments (*Urtheile*). His basis is the attitude of consciousness towards its objects: the data are either simply presented, or judged (reflected upon), or actively liked or disliked. I have already pointed out that affective and conative phenomena, so far as they are data of consciousness, involve nothing essentially different from presentations, so that I cannot regard his first and third classes as psychologically distinct. But Brentano's arguments for regarding the judgment psychosis as a distinct type of experience appeal to me very strongly, and as a matter of fact have had much to do with developing the view to be presented in the rest of this paper. His chief mistake, which is the mistake of the other classifications as well, is the endeavor to account for *each sort of experience* by a *single function only*, and to attribute to each function but one sort of experience. Judgment (in Brentano's use of the term) or reflection is concerned in the formation of many different sorts of conscious phenomena—of all, in fact, whose distinguishing feature is conscious discrimination; and in the production of these same phenomena other operations, such as association, are involved as well.

Let me suggest a view aiming to meet this criticism. The fundamental processes or functions of consciousness, as I conceive them, consist of *all radically different operations required to account for*

the particular phenomena of experience;¹ they should be *psychical*, not biological functions nor phenomenon of the material world; and they should *together account for all forms of consciousness*. From this point of view they need not be each exemplified in a particular phase of consciousness or class of experiences; as a matter of fact they *work together* in the production of the various sorts of mental states, the different types of coöperation constituting 'functions' in the usual sense of the term. I will mention in turn the functions which seem to fulfill these conditions.

The first to manifest itself in the evolution of consciousness is *Sensibility*, which is the basis of all experience, the operation by which conscious experience is brought about, as distinguished from the mere presence of neural or brain activity in the biological organism. Consciousness as it occurs in the lower organisms is simple. Tracing back the course of mental evolution we come to a point where, to judge from all indications, it is wholly undifferentiated. The physical data at this point are simple contacts of the environment; the resulting experience is a mere *undifferentiated continuum*. This first appearance of consciousness results, as a psychological phenomenon, from the activity of sensibility alone.

Differentiated experience, however simple, requires something more than this. The study of the evolution of consciousness has been hindered by the prominence of the biological processes. We are accustomed to consider each type of experience as something attached to a particular brain center, and to translate the evolution of the former into terms of the latter. But the differentiation of sense organs and of brain centers, the differentiated modes of physiological activity that result, do not accurately represent the differentiation that takes place in consciousness. The latter is a two-fold process, involving two very different functions. Every complex experience is made up of constituent elements which differ either *qualitatively* or *intensively* or both. These two sorts of difference existing among elementary experiences require the operation of two distinct functions: one produces *quality differentiations* of experience, the other *intensity modifications*. These are fundamental functions of consciousness. In the systematic treatment of psychology, whether analytic or genetic, they should be examined at the outset, and their rôle (separate or

¹ Cf. article 'Classification' in Baldwin's *Dict. of Philos. and Psychol.* (Vol. I., p. 188), where it is proposed that we treat 'as ultimate only those general modes which are necessary to constitute any and every concrete conscious state.'

joint) in the formation of particular classes of experience should be indicated in the discussion of each class.

The operation of quality differentiation is peculiar, since the quality differences of experiences are something without a counterpart in the physical world. The various sorts of chemical atoms are said to be 'qualitatively different,' and they form compounds which differ in many notable respects from the elements which compose them. But the differences between the elements, and the mutual relations of chemical compounds, can always be expressed in numerical terms of quantity of energy and space relations—the differences in the material world are quantitative, not qualitative. On the other hand, the difference between a sound and a color, as data of experience, has nothing quantitative about it; it is something unique to the world of experience. And the same is true of all sensation qualities. This has been insisted upon by many writers; but the widespread operation of the function in mental life has not been sufficiently recognized. Not a new complex experience arises but entails some qualitative change in the character of the data which compose it. Our state of mind, for instance, when we observe the printed letters *m*, *a*, *n*, side by side, is qualitatively affected by our knowledge of the English language; our perception of the letter *m* is something qualitatively different from the experience of an illiterate person viewing this same ink-impression on the paper; and the latter is quite different from the consciousness of a dog on whom the same visual stimulus acts. Quality difference is a difference not expressible in terms of *more* or *less*: it is *difference of sort*. It is a distinctive characteristic of experience, due to the operation of a fundamental function of consciousness. All 'differences of sort,' whether among sensations or complex experiences, can be classed together, I believe, as manifestations of a single function; the alternative is to regard every quality difference as due to a separate function, which would require the presence of a countless number of functions in consciousness.

Intensity differences, which are expressible in terms of *more* or *less*, correspond rather closely to the differences that exist in the physical world. Increase and decrease is a mark common to both. And yet the parallel is not complete: quantitative changes in matter or energy arise always through addition or subtraction, while intensity changes in experience are 'internal' changes of the entire experience. The simplest instance of this modification is the rise of intensity differences in sensation, which may be almost if not quite unaccompanied by changes of quality. Usually the two processes coöperate. The

rise of memory and attention are examples of this: memory elements are of feebleness intensity than sensations, but they possess also a peculiar quality of their own; attention results from the greater importance or 'bigness' of certain elements and a fading of others into 'subconsciousness,' but at the same time there is a quality change in the data, which we call 'vividness.' These examples indicate that intensity change is something fundamentally different from 'change of sort,' and must therefore be due to the operation of a distinct mental function. For convenience I will call the intensity function *Modification* and the quality function *Differentiation*.

A fourth factor in the development of consciousness is *Association*. The importance of this process, at least, has been recognized by psychologists; indeed, it will be recalled as the corner-stone of an early school. The mistake of these thinkers lay in over-emphasizing its rôle, or rather in their failure to appreciate the coördinate importance of other functions. Association requires the existence of two or more experiences at the same time, for even 'successive association' demands the simultaneous presence of the data at the instant of union. The experiences may be either simple or complex; but as the latter are themselves the result of association we have to consider the simple only in determining what is meant by the union of simultaneous experiences into a single state of consciousness. The physiological side offers no difficulty. Different neural centers, excited by stimuli from different parts of the same sense organ, or from different organs, are simultaneously active. These simultaneous physiological processes are brought together by activity in some connecting nerves, and the result is a complex activity. But the psychological standpoint will not allow us to substitute these terms for the processes of consciousness. The various elementary sensations have been accounted for by the functions of differentiation and modification; if two or more such elements occur simultaneously *as separate data*, they constitute 'split-off' portions of consciousness. Now, the union of such split-off or independent experiences into a single complex state can only be accounted for by the operation of a new function of consciousness; and it is to this that the term 'association' is applied.¹ The different forms of association that psychological analysis has discovered (fusion, integration, synthesis, etc.) depend on the nature of the par-

¹ The adoption of the term association instead of *combination* to denote the function has the sanction of the earliest usage, as instanced in the writings of the Associationists; see, however, the article 'Combination' in Baldwin's *Dictionary*, Vol. I., p. 198.

ticular data and on the manner of differentiation of the compound; the process of uniting the data is the same in all.

The simplest instance of association is found in complex sensations, in which simple experiences belonging to a single sense are united. Experiences, simple or complex, from different senses are combined into perceptions (or percepts) through the same operation. Memory elements are in like manner united, forming imagination images. Usually other functions cooperate with association. Thus the spatial character of perceptions is due to a particular sort of differentiation of certain of the data — the 'local signs.' Complex memory images, or 'memories,' are differentiations of perception — similar to the difference between memory elements and sensations. The division of experiences into presentations, feelings, and impulses rests, as already suggested, on the prominence of data from the external, systemic, and kinæsthetic senses, respectively, in the perception; this is a differentiation of sensation associations along three lines according to the character of the data. Further instances of cooperation are found in normal illusions: illusions of perception are borderline experiences between perception and memory, while illusions of memory are on the borderline between memory and imagination; in each case elements of the two classes are associated, with a new differentiation. Finally, emotions are associations of feelings and impulses.

The four functions so far discussed are sufficient to account for the phenomena of 'unreflective' mind. This includes both simple differentiated and complex states of consciousness. But the association of differentiated experiences — such as produces perception, for example — does not involve *recognition of differences* between the constituent elements. This fact of recognition, 'awareness of difference,' or reflection, is due to a further operation of consciousness, of a sort quite different from any of those already considered, which manifests itself relatively late in the course of mental evolution. To this function I would apply the name *Discrimination*, broadening the application of that term, though in line with its accepted meaning.¹ It constitutes the characteristic feature of both the judgment psychosis and the 'Unterschiedsempfindlichkeit' of experimental psychologists. It is the mark not only of judgment and belief, but of all reflection and self-consciousness. Whatever motor and systemic factors we may trace as its physiological concomitants, the act of discrimination itself is something purely mental, something without physical analogy. It results, as Brentano properly insists, in a new type of experience,

¹ As limited to *sense* discrimination; see Baldwin's *Dictionary*, Vol. I., p. 284.

which includes the data of perception, memory, and imagination among its constituents, but in which something new is added to these elements. The recognition of differences is not a mere quality change — it is a new sort of change in experience. And the function which produces it deserves quite as much study in systematic psychological analysis as any of the earlier ones.

The operation of discrimination upon perceptions produces apperceptions; where memories are concerned it produces concepts; where imagination images are concerned it produces ideas. As borderline phenomena between these classes of phenomena we find delusions. Meanings, rational beliefs, and values are particular kinds of differentiation of reflective data: in ordinary cases they are marginal elements attached (by association) to the reflective data; but by further discrimination on these marginal elements new reflective experiences arise. Thus, words and other associated symbolic elements constitute the basis of meaning; meaning itself is produced by a further reflective act on these associations. The traditions of formal logic have obscured the analysis of the 'rational processes.' Rational discrimination acts generally upon concepts, though apperceptions and 'free' ideas may also be its data. The associations which we call rational, whether simultaneous (logical 'judgment') or successive (reasoning), differ from the ordinary 'free' associations in being limited by the so-called 'laws of thought.' And this limitation signifies that those associations which reproduce in consciousness the 'consistent' workings of physical nature, have proved in the race history so much more self-consistent, so much further-reaching in the organization of presentative experiences, and so much more useful in their relation to the impulse complexes, that they have come to form a special type of associations. When discrimination appears this difference between 'rational' and 'free' associations comes to be recognized, and the added element transforms the unreflective rational associations into 'rational beliefs.' The rôle of discrimination in producing the consciousness of values can be traced in much the same way. The transformation of impulse into volition is also the result of discrimination. The imagination of an 'end' of activity may arise before the reflective stage — as an image similar to other images, but resulting physiologically in action which brings about the situation imagined, which situation, in turn, is accompanied by sensations similar to the 'end' image. But this is still impulsive consciousness; it is transformed into volition only when the end is discriminated from other images — that is, when it becomes a conscious 'purpose.' The transforma-

tion of feelings into sentiments can be similarly traced. Finally, the common character of all experience is picked out by an act of discrimination, giving the reflective experience of self, or self-consciousness.

To summarize. The five functions which I have mentioned — sensibility, modification, differentiation, association, and discrimination — are fundamental mental processes of different sorts which the data furnished by sensory and central stimuli undergo. Their working together has resulted in the evolution and development of consciousness into the many types and the multitude of complex forms found in human experience. Two of these functions — modification and association — are in a measure similar to phenomena of the material world; the other three are totally unlike anything outside of consciousness. I give in tabular form the relations between these fundamental functions and the principal classes of experience as indicated in the preceding discussion, following the genetic order of the latter :

TABLE.—SCHEME OF MENTAL FUNCTIONS AND EVOLUTION OF CONSCIOUSNESS.

		KINDS OF EXPERIENCE.	FUNCTIONS.
Unreflective.	Simple.	First appearance, Continuum of experience (undifferentiated sensation)	by Sensibility.
		From this, Experiences of different degrees (sensations of varied intensities)	by Modification.
		From these, Experiences of different sorts (sensations of varied qualities)	by Differentiation.
	Complex.	From these, Experiences duplicated (basis of space character), diversified (according to sense organ), attended to; memory elements	by same functions.
		From these, Complex sensations, perceptions, imagery	by Association.
		From these, Memories; presentations, feelings, impulses; normal illusions of perception, of memory; emotions.	by same functions.
Reflective.	Complex.	From these, Apperceptions, concepts, ideas; delusions	by Discrimination.
		From these, Meanings, rational beliefs, values; volitions, sentiments; self-consciousness	by same functions.

If the main point of my contention be admitted, the distinction between *function* and *structure* in the generally accepted use of those terms seems of relatively small importance. Whether we deal with perception or percepts, memory process or memories, imagination or

images, does not affect our analysis. On the other hand, this view makes the *fundamental functions of consciousness* and the *kinds of experience* something quite distinct, requiring separate treatment in the psychological analysis.¹

I do not mean to belittle the physiological and physical data that 'underlie' sensations, nor the nervous processes that 'underlie' perception, volition, etc. I wish merely to show that the rise of any particular experience and its make-up as a datum of consciousness can be fully described in terms of certain fundamental mental functions, without recourse to neurological terms at all. Regarded from this standpoint, psychology involves physiology only as the latter involves physics and chemistry. The analysis of mental content in terms of essentially mental functions and the tracing of its growth in the same terms afford, I believe, the only solid basis upon which to build an independent natural science of psychology.

¹This résumé has necessarily been brief and rather dogmatic, and I am conscious of many obscurities and doubtful points. The main outline of the theory suggested itself some years ago and has stood the test of personal criticism in the meantime; it is offered here in a preliminary way for discussion, to determine whether it is worth following up.

PSYCHOLOGICAL LITERATURE.

MENTAL EVOLUTION.

The Hand in the Evolution of Mind. ROBERT MACDOUGALL.
Amer. Jour. of Psych., 1905, XVI., 232-242.

Individual variations in color, venation, texture of skin, plumpness, size and shape of the hand have given rise to recognizable types popularly connected with special aptitudes and temperaments. Specific variations of the organism are significant of specific mental correspondences. The body, as the instrument of the mind, and the mind, as the system of functions connected with a body, are not independent entities. The sensory and reactive mechanisms condition the character and range of experience and limit the evolution of intelligence more closely than does the elaboration of the nervous system. The development of the hand is of especial interest. The opposition of digits made possible superior types of manipulation and construction, while the ensuing mode of life called for higher mental activities. Beyond this point survival variations appear to be chiefly dependent upon central nervous organization, development consisting of increased facility and precision and of ingenious use of mechanical instruments. Structural development is not arrested. Cerebral development requires more sensitive and discriminative perception as well as the possibility of more delicate reaction. In the elaboration of the perceptual world sensory elements have meaning only by virtue of their union with definite reactions. Hence, mechanical limitations upon reaction determine the interpretation of sensory content. The functional superiority of one sense over another is due to difference of sensori-motor correlation. The associated activities are important in the interpretation of visual and auditory sensation as well as of tactual.

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Zur Frage der phylogenetischen, vikariierenden Ausbildung der Sinnesorgane. G. ALEXANDER. Zeitsch. f. Psychol. u. Physiol. d. Sinnesorg., 1905, XXXVIII., 24-33.

After a minute description of the details of her investigation, the author gives the following summary:

I. That the development of the ear in *Talpa Europea* and *Spalax*

typhus is remarkable is demonstrated by the relative size of the transverse section of the cochlea, the large number of sensory cells, and the size of the eighth nerve.

II. The sensory cells of the organ of Corti form, at intervals, four lateral ciliary rows at some distance from the pillars of Corti. To these come also an axis of ciliary cells so that five ciliary cells are situated in a radius.

III. In *Talpa Europea*, near the lower ampula and indeed in the sinus utricularis inferior, there is a macula neglecta which is not found in the rest of the higher mammals, is here shown for the first time in a higher mammal, and, with the exception of birds and reptiles, has been found only in one other of the lower mammals — *Echidna aculeata*.

IV. An excellent balancing, anatomically, is shown, in the case of both species investigated, in the unusual size of the terminal place of the nerves. In the case of the mole the balancing is shown also in the relative increase in the number of the sensory cells and a fold between furrow-like formations on the endolymphatic surface of the neuroepithelium.

V. The morphological transition of the labyrinth of the lower mammals into the higher is illustrated in the anatomical condition pointed out in III.

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CHILD PSYCHOLOGY.

Nouvelles méthodes de mesure applicables au degré d'instruction des élèves. V. VANEY. Année psychol., 1905, XI., 146-162.

Notes sur l'éducation des enfants arriérées à l'école de la Salpêtrière. MEUSY. Année psychol., XI., 83-93.

Sur la nécessité d'établir un diagnostic scientifique des états inférieurs de l'intelligence. A. BINET et TH. SIMON. Année psychol., XI., 163-190.

Méthodes nouvelles pour le diagnostic du niveau intellectuel des anormaux. A. BINET et TH. SIMON. Année psychol., XI., 191-244.

Enquête sur le mode d'existence des sujets sortis d'une école d'arriérées. A. BINET et TH. SIMON. Année psychol., XI., 137-145.

M. Vaney holds that age and the ability to read, write, and count are not adequate criteria for determining the school standing or amount of instruction received by the child. Appreciating this, the

author attempts to establish standards which should be met by the normal child during the seven primary school years between the ages of seven and thirteen inclusive. These standards, which represent degrees of knowledge, are very clearly specified. Normal children should have no difficulty in meeting these requirements, for in general they are very simple, and those who do so are making satisfactory progress. The needed help can be given the retarded or backward child, who, it is claimed, can be detected very readily by this scheme.

M. Meusy reports that about one hundred and fifty defective children are enrolled in the Salpêtrière. These children are grouped into four classes according to mental ability, not age. The lowest or fourth class is for the most part made up of partial paralytics. Effort is made to teach them simple songs, simple manual exercises, location of parts of the body, how to dress themselves, etc. Much stress is laid upon gymnastic exercises, and slight progress is made in writing and speaking.

Many of these children then become ready for the third class. Learning to write is a favorite occupation. Color and form are taught and simple drawings are made. The children learn to recognize animals and other objects. They are taught to pronounce correctly. Manual exercises and music occupy a large part of the time.

Ability to read and write admits to the second class. The rudiments of French history and geography are taught and very simple reading lessons given. Effort is made to teach something of the value of different coins and further acquaintance is made with surrounding objects. Memory is cultivated by easy lessons in grammar and by the multiplication tables.

Children of the first class compare favorably with normal primary children. Addition, subtraction and multiplication are rather easily learned, but division is very difficult. Imagination and judgment are lacking and the vocabulary is restricted.

Under the very careful instruction, many of the children succeed in earning certificates of study and a few even become self-supporting by means of some simple trade.

Binet and Simon point out, in their first-named article, that the diagnosis of the condition of mentally backward children is very difficult on account of the lack of a generally accepted scientific terminology. The same child has been called an imbecile by one physician, idiot by a second, feeble-minded by a third, and degenerate by a fourth. There are three potent causes for such disagreement: ignorance, variable meaning of terms, lack of care in observing the symptoms. In re-

sponse to the need several classifications have been attempted, usually either symptomatic or anatomico-pathological. Some of these are discussed. While the authors do not present an original classification, they state that the satisfactory one will be based upon clinical psychology.

The tests outlined in the second article by Binet and Simon are for the purpose of investigating the true physical and intellectual status of mentally deficient children. These tests are grouped under three general methods, the psychological, the pedagogical, and the medical.

1. *The Psychological Method.* — The problem is to measure the degree of intelligence. Repeated trials have led to the selection of the following tests, arranged in the order of increasing complexity: movements of regard; prehension following tactile stimulus; prehension following visual stimulus; recognition of food; procuring food by overcoming a slight mechanical difficulty; execution of simple orders and imitation of simple gestures; verbal recognition of objects; of pictures; naming designated objects; immediate comparison of two lines of different lengths; repetition of three numbers; comparison of two weights; suggestibility; verbal definition of known objects; repetition of fifteen-word sentences; stating differences among several known objects from memory; memory for pictures; reproduction of designs from memory; stating resemblances among several known objects from memory; comparison of lengths; arranging in order five weights; detection of gaps in weight series; rhyming words; supplying missing words; formation of sentence using three given words; answering abstract questions; telling time by inverting hands of watch; definition of abstract terms. The peculiar nature of the observers makes it necessary for the experimenter to exercise great care. Detailed directions are given for all the tests, and special caution is urged in overcoming the ordinary errors in methods of procedure.

2. *The Pedagogical Method.* — The investigation is made to determine the amount of knowledge actually acquired by defective, and to compare this with that acquired by normal children. Equal emphasis is placed upon knowledge acquired in the school room and out of it. The answers to an ordinary questionnaire and a few simple tests furnish the necessary data. No important new contribution is made.

3. *The Medical Method.* — Attention is directed to the discovery of anatomical, physiological and pathological causes and conditions of defective intelligence. Record is made of hereditary tendencies as age of parents at birth of child, alcoholism of parents, tuberculosis

and neuropathic affections in family, consanguinity of parents, order of birth of child in family, mortality of brothers and sisters; developmental irregularities as retarded dentition, walking and speaking; anatomical features as size, weight, shape of head; pathological conditions as adenoids, tuberculosis, rickets, syphilis, defective nutrition; and such other characteristics as the condition of organs of special sense, respiratory and circulatory functions, temperature, blood count, facial expression, etc.

The authors hold that these three methods, the psychological, the pedagogical and the medical, reveal respectively *certain*, *probable*, and *possible* indications of abnormal conditions. On the whole the article is suggestive, but it does not contain much that is really new.

The third article by Binet and Simon deals with the efficiency of the instruction given at the Salpêtrière as shown by the history of those leaving the institution. Information was obtained of one hundred and twenty persons leaving since 1900. The average time spent in the school was about seven years. The average age at leaving was eighteen. Epilepsy was by far the most common disorder, next in order being feeble-mindedness. Of the number given above, twenty persons were benefited, of whom twelve follow professions and eight have returned to their families. Twenty others returned home about whom further information was not obtainable. Sixty passed the age limit and were transferred. Seventeen died, and three so-called martyrs were really normal. Feeble-minded children and simple epileptics received the greatest benefit.

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A propos de la mesure de l'intelligence. A. BINET. *Année Psychologique*, 1905, XI., 69-82.

The title of this article is justified by a preliminary review of an attempt by Biervliet¹ to set up a measure of intelligence by visual and tactual tests and a consideration of the mean variation. In this Binet remarks on the noteworthy utterance that in the mean variation there is found a register of attention. He then proceeds to the consideration of the main question as to the best means of measuring intelligence, especially in schools, when such a measure is often required as a basis for further investigations. The method advocated, which, it is admitted, may not be altogether original, is that of the degree of instruction as determined by the school grade of the child. This method

¹*Journal de Psychologie*, I., p. 225.

gives more reliable information than is to be had from the personal estimates usually furnished by the instructor as the basis of psychological and pedagogical studies of children. The opinion that the relation between school grade and age gives a satisfactory means of measuring the mental status of the child is confirmed by experimental investigations in such widely divergent lines as memory and cephalometry.

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RACE PSYCHOLOGY.

Observations on the Senses of the Todas. W. H. R. RIVERS.
British Jr. of Psychol., 1906, I., 321-396.

The Todas of the Nilgire Hills in southern India are a small community of about 800 individuals. They are a race in which there has been no incentive to extraordinary development of the sensory powers, nor until recently have there been any causes at work to produce pathological changes in the sense organs.

The method of work was the same as that used in the Cambridge expedition to Torres Straits. The people came in groups of twos or threes to pass the morning in being tested, and ample time between tests was given each one to recover from ennui or fatigue. It was necessary to use an interpreter, but it is thought that this did not interfere with the work.

Visual Acuity. — The method of treating was to use a modification of the E-test devised by Cohn. Eighty-four men and boys were tested and fourteen women and girls. It was found that the average distance at which the letter E could be distinguished was 2.2 times the normal distance, according to the system in ordinary use. These figures show the Todas to have a somewhat higher average acuity than the inhabitants of Torres Straits and fewer subnormal cases.

Color-vision. — By means of Holmgren's wools the names of colors were obtained. It was found there were definite words for red and yellow, less definite nomenclature for green and blue; blue and black are often given the same name and there are no definite terms for brown or violet.

Color Discrimination. — Out of five hundred and three individuals, forty-three were color blind. They all show a tendency to discriminate greens, blues and violets less definitely than reds and yellows.

Color Thresholds. — Lovibond's tintometer was used for these experiments. The average of tests of forty-seven well show that the

threshold for red is slightly higher than that for yellow, but both are considerably lower than that for blue.

A comparative table of the color thresholds for five races — Todas, Uralis and Shalagas, Egyptians, Papuans and English — shows:

1. That the Todas have the highest thresholds for red and yellow. It is very much higher than that of the Papuans where red-green color blindness does not occur.

2. That the threshold for blue is higher than that of the English but lower than the other barbarous people.

Color Fields. — Small colored discs pasted on black grounds were passed from outside the field of vision to the point of fixation. It was found that in all cases the color fields were so small that they could not be differentiated.

Color Blindness. — 12.8 per cent. of the 503 men examined showed definite cases of red-green color blindness. This fact taken in connection with small size of the color fields suggests that in these individuals the red-green area has diminished until it has disappeared.

Visual Illusions. — Quantitative observations were made to ascertain the degree in which the Todas are subject to two geometrical-optical illusions; (1) the erroneous estimation of vertical as compared with horizontal lines and (2) the Müller-Lyer illusion.

The Illusions of Compound Horizontal and Vertical Lines. — The tests gave the following general results:

1. The illusion was greater when the horizontal was the variable line.

2. When the variable line is made equal by shortening it shows a greater length than when it is made equal by lengthening.

3. The observations with the two methods are fairly constant.

Similar observations were made on forty Englishmen, Cambridge graduates and undergraduates. Compared with the Todas they show a relatively slight illusion. With both Todas and Englishmen the illusion is greater by the first method.

The Müller-Lyer Illusion. — By means of an apparatus with a sliding board the figure was set until it seemed equal. It was found that the Toda sees the illusion in a greater degree than the Papuan and in a slightly smaller degree than the English observer. The explanation suggested is that the savage is less influenced by the figure as a whole. The fact that savage and civilized men react differently to these two illusions suggests a mere physiological explanation for the former, and a more psychological for the latter.

Tactile Discrimination. — The threshold for the discrimination

of two points on the skin was tested at three places by the method used by Mr. McDougall in Torres Straits. The results show the English less sensitive in the forearm, but more so on the nape of the neck and on the finger. Comparing all the data it is found that tactile discrimination increases with intellectual development. The same is true of sensibility to pain, which was tested by means of Cattell's algometer.

Smell. — The method was to use different dilutions of a standard water solution of camphor. The results show that the English have a slightly better sensitivity than the Todas. Dr. Myers, however, found the Papuans slightly more sensitive.

Taste. — It was found that the Todas have words for the four pure taste sensations.

Conclusions. — The general conclusion which may be drawn from the available evidence is that pure sense acuity is much the same in all races in the absence of definite pathological conditions, and that the frequent superiority of the savage over civilized man in his recognition of what is going on around him in nature is due to his trained powers of observation.

However, the comparison of sense acuity in races of different culture is very much complicated by differences in the part played by inference in determining the sensory threshold. This factor plays little part in the determination of visual acuity, but has a marked influence on the determination of tactile acuity, and plays an even greater part in the determination of the acuity of smell. Its effect is always to lower the threshold, *i. e.*, to give to the individual an appearance of sensibility which is higher than he really possesses.

Dividing all the subjects into two groups, those above and those under thirty-five, it was found that age had a marked influence on two senses, sight and smell.

In the region of color vision, the most interesting feature of the Todas is the frequency of color blindness. The color nomenclature is especially defective in any adequate expression for blue, and associated with this is a defective sensibility for blue. They add therefore to the evidence that in lower races defective color nomenclature is due in part to defective sensibility.

An interesting result of the observations on illusions is the evidence that the processes involved in the tests are much simpler for the Toda than for the more civilized man. The results often came out more clearly and definitely in the case of the savage, because he attends simply to the matter to which he is asked to attend and is not troubled with speculations as to the why and wherefore.

In connection with the quantitative tests recorded, coefficients of variability are given. The comparison of variability in different races is complicated by several factors. In illusions, for instance, different individuals may vary: (1) in the degree to which they are subject to the illusion; (2) in the method of carrying out the test; (3) in the degree of care and attention which they give the observations; (4) in different degrees in which fatigue and practice make their effects felt.

In several of the measurements for which Papuans, Todas and Englishmen have been tested, the Todas are found to occupy a position between the other two. In general intellectual and cultural development the Todas undoubtedly occupy an intermediate position. This suggests that there is a connection between general intellectual development and such mental operations as are tested in these experiments. The evidence is, however, at present too scanty to establish this proposition.

ELIZABETH O'NEIL.

BRYN MAWR COLLEGE.

Acquisition of Written Language by Primitive Peoples. ALEXANDER F. CHAMBERLAIN. Amer. Jour. of Psychol., 1906, XVII., 69-80.

In this article a résumé is given of the attempts made, chiefly by missionaries, to instruct tribes of American Indians in writing their own tongues. The subject is treated primarily from the point of view of the methods by which the problem was approached, as a contribution to the psychology of language-learning, and includes the following tongues: Algonkian, Athapascan, Chinookan, Eskimoan, Iroquoian, Salishan and Siouan.

The difficulties which our missionaries have had in teaching primitive peoples some method of recording their language have led to all kinds of experiments, and it is peculiar to note that all successful results have been along the same line, viz., a kind of syllabic spelling.

For a language containing only the broad vowels and a limited number of consonants, a series of signs or marks to represent these vowels and consonants can readily be invented, as is shown by the many instances given in this article; and such a system of phonetic writing a child will learn within a few days, and often even within a few hours.

For a great many years the languages of some of the tribes in the Indian Territory have been written by a system of phonetic, or syllabic components, and a paper printed in this system has been published

by the General Council of the tribes and distributed free. It has been claimed that every Indian speaking the language in which it was published could read this paper, yet there were no schools in which they were given instructions in the writing. It was something that could be learned in a few days and they just picked it up. The writer does not know if this paper is published now, but in his travels in the Indian Territory he has frequently seen it and knows that it was published some fifteen years ago, and it is his belief that the superior civilization of the tribes mentioned is due largely to this educational influence.

We believe a little careful thought will lead us to see what a great difficulty confronts the child in learning to read by our present method of writing. Letters mean absolutely nothing to a child, and it is often months under the old system of learning to read before the child sees any application of them whatever, and so there is nothing to excite interest up to this time. Under the 'word method' a practical application is made at an earlier date, yet the difficulties of this method are great; and when we learn that an illiterate, half-breed Indian invented a system of syllabic spelling by means of which a child easily learns to read without any instruction whatever, it would seem to be a severe criticism on our 'advanced methods.'

A short bibliography is appended to the paper.

W. R. MILLER.

NEW YORK UNIVERSITY.

Primitive Hearing and 'Hearing Words.' ALEXANDER F. CHAMBERLAIN. *Am. Journ. of Psychol.*, 1905, XVI., 119-130.

"In this essay an attempt is made to bring together certain facts of anthropological-psychological interest, not to exhaust a subject the investigation of which has hardly yet begun." The topics considered are: 'Acuteness of Hearing,' 'Deafness,' 'Ear and Hearing in Folklore and Mythology,' 'Ear-mindedness,' 'Noises, Musical Sounds, etc.,' and 'Onomatopœia.'

HUGH S. BUFFUM.

UNIVERSITY OF IOWA.

The Native Tribes of South-east Australia. A. W. HOWITT. London and New York, The Macmillan Company, 1904. Pp. 819.

The Northern Tribes of Central Australia. BALDWIN SPENCER and F. J. GILLEN. London and New York, The Macmillan Company, 1904. Pp. xvi + 784.

These volumes, while in the main confirming previous work of

their distinguished authors, are valuable for the social psychologist as throwing additional light on totemism and affording additional illustration of the intricate relations between group and individual involved in the classificatory system of relationships. As regards totemism, Spencer and Gillen find the belief in the re-incarnation of ancestors widely extended, and not confined to the few tribes studied in their former book. They find it present in tribes reckoning descent in the female, as well as in those reckoning it in the male line. The ingenious device by which the belief is combined with the custom in some tribes of always counting the child as belonging to the mother's totem, is worth noting. In this case it is held that the spirit selects only a woman of the right totem when about to re-incarnate itself. Both volumes testify that the conditions of utter brutality alleged to prevail in the treatment of the women are not found in the tribes known to them. The value of the initiation ceremonies in inculcating respect for the elders and the group is emphasized. The method for the change or transfer of customs through the conferences of old men and the mutual visitations, indicate that the imitation is deliberate. Ceremonies to increase the supply of the totem plant or animal are also found to be of wide extent. This is in the line, so far as Australia is concerned, of tracing totemism to economic sources.

Bushido, The Soul of Japan. INAZO NITOBÉ. Philadelphia, Leeds and Biddle Company, 1900. Pp. 127.

Japan. An Interpretation. LAFCADIO HEARN. New York, Macmillan Company, 1905. Pp. 549.

These two books afford interesting material for the social psychologist by their exposition of one of the most remarkable instances in history of the extent to which a class-standard and a kinship-religion may impress and sustain the individual. The recent war has shown the effects of this influence. These books make the conduct of the Japanese Samurai intelligible. While Bushido is originally the standard of a class (literally Military-Knight-Ways), it nevertheless has an influence also upon lower classes as setting before them a standard for imitation. The leading characteristics of Bushido, rectitude or resolution, courage, benevolence, courtesy and veracity, all have their specific content modified by this class consciousness from which they derive.

Mr. Hearn's book emphasizes especially the religious bonds by which the Japanese is attached to family, to clan and to nation.

J. H. T.

INDIVIDUAL PSYCHOLOGY.

Psychologie de deux messies positivistes, Saint-Simon et Auguste Comte. GEORGES DUMAS. Paris, Alcan, 1905. Pp. 314.

The key to the lives of the two positivists is sought by the author in their belief that they were not merely philosophers but messiahs. They were not alone among their contemporaries in cherishing such a belief in a mission. Fourier, Enfantin, and others were in like manner convinced of their prophetic and messianic functions. The destructive criticism of the eighteenth century upon the old order gave an open field for the enthusiasts who had, as they believed, the gospel of a new religious and political dispensation to announce. Both Saint-Simon and Comte took themselves and their gospel seriously. Saint-Simon entitled himself the 'vicar of God on earth,' and Comte similarly styled himself *grand prêtre de l'humanité*. Both regarded it as their mission to restore the social and spiritual to its supremacy over the rationalistic and critical. Napoleon, although denounced by Comte, was really the living model for much of the messianic conception. If we use this messianic idea as the key, we can explain Saint-Simon's life without the supposition of insanity; or if it is claimed that at least there was a psychopathic temperament, it may be asked if such a temperament is not one of the biological conditions of the messianic passion. In the case of Comte we have to recognize also the strong influence of his passion for Mme. de Vaux.

The treatment of the thesis suggests that it may be difficult to draw the line between a consciousness which may, in any very significant sense, be called 'messianic,' and such a conviction of a 'mission' as inspires many a life. Is the difference one of degree of conviction, or of emotional fervor, or of complete absorption in the idea, or of a social milieu so permeated by sympathetic anticipation as to raise the whole consciousness to a unique attitude? M. Dumas has not attempted to answer such questions as these, but takes the messianic as a sufficiently well understood category.

J. H. T.

SOCIAL PSYCHOLOGY.

Primitive Traits in Religious Revivals; a Study in Mental and Social Evolution. FREDERICK MORGAN DAVENPORT. New York and London, Macmillan, 1905. Pp. xii + 323.

We have here a good account of a number of striking religious revivals in America and in Great Britain; an analysis of the character of those among whom such revivals are apt to occur, as well as of

those who are successful revivalists; and an estimate of the influence of the revival method upon religious and secular social development. The book is both scientific and practical; it not only makes an 'objective' study of revival phenomena, but would also give guidance to those who control our religious organizations.

The revivals here described are the snake-dance and 'shaker' epidemics among the American Indians, the endemic revivals among our negro population, the revivals among the Scotch-Irish in Kentucky in 1800 and in the 'old country' in 1859, the 'great awakening' in the American colonies under Edwards and Whitefield, the Wesleyan revival in England, and finally the revivals in what the author calls the 'transition period' in the United States, under Nettleton, Finney and Moody.

Revivals, according to Davenport, occur most readily among primitive peoples and among those classes of our more civilized communities whose primitive traits lie nearest the surface, — where there is 'nervous instability,' a ready suggestibility, with a free play of imagination and emotion, especially fear. Along with these there is a frequent tendency to sensory and motor automatisms, marked by a narrowing of the field of consciousness and the rise of secondary personalities. When the higher centers of inhibition are developed, reflection occurs and the impulsive processes are checked, and revival phenomena are less readily induced.

The author believes that the revival-method is falling into disuse, and the explanation of this he finds in the fact that large areas of the American population are becoming more civilized and less primitive. "They who are preaching a revival of old-time revivalism in the highly developed sections of America are fighting against the stars in their courses. Recurring tides of faith there may be for generations to come, but they will steadily change in character from those of the old régime. It will require a more rational method to win men in the modern age" (p. 213). He is discriminating in his final judgment as to the value of the revival. "Sometimes it has been a helpful result religiously to the individual. There are many who have dated their spiritual birthday from such an experience. But there are also many, the record of whom has not been so carefully kept, who have been spiritually injured for time if not for eternity by this process. And there is a grave social danger in such a method of training large elements in a population. The man who yields unquestioningly and uncritically to impassioned appeal in the crisis hour of his religious life will do it in the crisis hour of his political life. And this is the

vice of democracy" (p. 285 f.). He thinks that the use of the revival method has been of important influence in making church membership predominantly of women, women as a class being more susceptible to suggestion and emotional appeal. This is an interesting view, but it is probably incorrect, inasmuch as the attendance of women is greater than that of men in many churches which make no use whatever of revival methods. The author points out the remarkable collocation of revival and other forms of social eruption, in that the same counties of Kentucky which were the focus of the great religious excitement of 1800 have also been the scene of a disproportionately great number of lynchings in that state.

So that, in general, the position is taken that our need is for more reflection, for a strengthening of reason, rather than, with James, to throw distrust on all this and to favor the subliminal and instinctive channels of religious illumination. "The safer doctrine is that neither the passionate nor the rational is the channel of special supernatural communication, or else that both are, through a real though insensible union of divine influence with the human at the springs of action. It is a shallow religious philosophy that is able to trace the supernatural in the 'affections,' but cannot trace at least dawning divinity in the developing reason of mankind" (p. 274).

The book is admirable in many ways. It is perhaps marked by facility rather than by great power and depth. And there is at times a certain air of intellectual satisfaction and repose in the presence of intellectual conceptions that are vague and in need of more critical handling. To take a single instance, 'nervous instability,' as a characteristic of primitive persons, is made much of, without any analysis of its great variety of contents so as to show in what respect the nervous system of primitive man is less stable than that of civilized beings, and in what respect it is not. The presence of intellectual inhibition, which at another point is made a chief mark of civilized man, is hardly equivalent to nervous stability in general. It goes with a high degree of nervous instability of a certain sort. The conservative strain in the primitive man and in the childhood of civilized beings, — the strong opposition to many forms of innovation, — should certainly be taken into account before we can, without more ado, mark the lower stage as unqualifiedly less stable.

But in dealing with a topic where partizan feeling, either of the anti-scientific or anti-religious kind, is so ready to appear, we must commend the author's balance and discretion. The book should prove helpful to readers of quite contrasted training and sympathies.

JOHNS HOPKINS UNIVERSITY.

G. M. STRATTON.

PLAY.

The Psychology and Philosophy of Play (I.). W. H. WINCH.
Mind, 1906, XV., 32-52.

This paper deals with the standpoints from which the subject may be regarded, followed by a discussion of the Psychology of Play. The latter is treated under four heads, viz., Imagination and Perception, Reality and Fiction, Play in Language, Play in Art.

Regarding the standpoints from which definitions of play have been made, the writer declares that the word play has not escaped those variations which occur in classifications of science. We must distinguish between the psychological and philosophical standpoints. Psychology is individualistic, philosophy aims at general conditions. According to Professor Groos, 'the essential point in the definition of play is its quality of practice or preparation.' This is a philosophical rather than a psychological definition. The game is played for itself and for no other end.

Of Froebel's assertion, 'Play is the purest activity of man at this stage (childhood) and at the same time typical of human life as a whole,' the writer questions the justification. He holds Professor Groos's conception of play to be only partially true, and to be dangerous as applied to educational practice.

Professor Groos's view of play regarded teleologically may be compared with the biological view that 'play is a functioning of the immature organs subserving the life functions of the adult.' This doctrine, he observes, is in contrast with the recapitulation theory — the father's work has become the children's play.

From the individualistic standpoint it may be said, first, that those activities are playful which are performed for the sake of the game; second, that insofar as the conscious acquisition of skill in the game or anything else is present, the mental attitude ceases to be purely playful; and third, that the plays of life are more or less dissociated from the great body of beliefs and actions which make up the conception of our real world. Further than this, however, we cannot go without difficulties.

Adult play manifests the characteristics which the word implies more definitely than youthful play, and is more clearly dissociated from practical needs. As life advances we know better what is play and what is work.

The writer takes exception to Groos's affirmation that 'the feeling of pleasure that results from the satisfaction of instinct is the primary

psychic accompaniment of play,' since the game is for its own sake and not for the sake of pleasure. Work is often pleasurable and play is not always so. That energetic action is in itself a source of pleasure (Groos) is an insufficient distinction, for all play is not energetic and much work is. Groos lays stress on the fact that success in play brings joy, but so does success in work; and this criterion of play does not distinguish it from other activities with which it is often contrasted. In short, it is impossible in childhood to distinguish play from serious activities.

In discussing Imagination and Perception in Play, the writer calls attention to the erroneous tendency to look upon 'sensation' as depending entirely upon external objects, and to ignore the fact that sensation is not a 'fixed absolute' and that perceptive judgments may be false. Professor Sully holds perception to be a compound of sensation and ideation, and says 'it is no less true that imagination in an active constructive form takes part in the very making of what we term sense-experience.' The writer doubts if this be justifiable, and asks, 'must we not suppose that perceptual cognition is prior to imagination?' and, 'are not children's play perceptions the result of lack of distinction?'

Mr. Winch assents to Professor Sully's supposition that color hearing and like phenomena showing themselves after childhood are survivals of early and fanciful brain-work, and says that the child's mind confuses imagination with perception, image with sensation, and in regard to the 'vividness of the images in color hearing,' he prefers to suppose that the sound stimulus has a direct effect upon color vision without the intervention of images at all, this view harmonizing better with our ideas of biological development than the diminished adult view of early life. The point is, says Mr. Winch, that the elements of the sensational complex modify each other.

Under his second division the writer attacks the tradition that 'the characters of early history were a series of mental syntheses personified by the imagination.' Uncritical anthropology usually told of the marvelous imagination of primitive peoples. Historical criticism and recent anthropology alike reach conclusions adverse to this belief. Dr. Stout asserts that 'primitive beliefs are nearly all relevant to the narrow circle of the savage's practical interests.' Any mental association of objects leads to a belief in a real connection, and this is not imagination pretending a connection in which it does not believe, for the connection is antecedent to imagination. When imagination and perception are differentiated, such connections are beginning to dissolve. A period intervenes where 'dissolution detaches what we

thereafter call superstition from the main body of belief, and these superstitions cease to be real and become play, fiction, art.'

"We must beware," says Hartland, "of crediting the story-teller with that decree of conscious art which is only possible in an advanced culture and under literary influences. Indeed research goes to show that story-telling is an inevitable and wholly unconscious growth probably arising out of narratives believed to record actual events." Thus, in the words of Stout, "What may be a transient play of imagination in the civilized mind is the permanent and serious attitude of the savage mind." These beliefs are found in children, and are irrelevant to the practical activities of life. Instead of being a preparation for serious views of life the proper work of education is to destroy them.

Two problems are suggested for consideration in the third division of the article, viz., Is play-language atavistic? and, To what extent will children acquire language spontaneously and by play? To the first question the writer answers, Yes. In play we find 'such interjectional utterance and distinction as we find lower down in the evolutionary scale of language.' To the second question he replies that the power of individualism in the theory of education to-day is dangerously approximate to the idea that every child should invent his own language. The writer objects to the 'purposely false nomenclature' which the present system demands, and says that Kindergarten names are rarely spontaneously applied, and when used in class do not remain with the Kindergarten object but are used to designate objects in daily life. Such a system is to be condemned because it pretends to a spontaneity which it lacks, and because the method hinders rather than furthers the learning of the language of life.

After recognizing the connection of art with the play impulse, the writer, in the fourth part of his paper, passes on to consider the development of art, as an aid to the discussion of the play impulse. Professor Haddon maintains that 'the most of artistic expression owes its birth to realism.' Papuan drawings represent parts of figures which cannot be seen, and children draw in the same way — what is, rather than what can be seen — two eyes in a profile sketch, for instance. The child may imagine that he can see both eyes, or he may confuse what he knows with what he sees: the second solution is more likely. Again, children, as Professor Sully says, are oblivious of dress and will draw the form before the dress. Savages draw the same way. The explanation is that the child and the savage draw what they know rather than what they see. In conclusion the writer insists that the child must be taught to distinguish what he sees from what he knows.

Professor Sully thinks that the visual image is correct, but the child is not able to draw his image, has no power over his movements. To this Mr. Winch objects, urging that 'the power to see is the result of a long and difficult analytical process.' And he finds in children's spontaneous drawings the same characteristics as appear in their inventive language.

B. G. DEMAREST.

NEW YORK UNIVERSITY.

DREAMS.

The Psychology of Dreams. JAMES RALPH JEWELL. Am. J. of Psychol., 1905, XVI., 1-35.

The material for this study was gathered by means of a questionnaire sent to normal schools, both teachers and pupils being requested to furnish data. In all, about eight hundred persons responded and about two thousand dreams were available for the investigation.

The deductions of the author are based, for the most part, on an examination of the dreams narrated rather than on the subject's own analysis of his dreaming states. The most important results obtained group themselves about the general topics: the causes of dreams, the logical character of dreams, their emotional and moral tone, and their confusion with reality.

The causes are found to be two kinds, physical and psychic. Of physical causes there are two distinct classes: (1) stimuli from the outside world on the end organs of sense, and (2) organic and muscular sensations. Of the psychic causes there are, likewise, two: (1) memory and association, and (2) suggestion.

In regard to the question as to whether judgment is active or in abeyance during dreams, Mr. Jewell finds that at times the train of thought of the dreamer is entirely logical.

In proof, cases are cited in which sleeping persons carry on perfectly rational and coherent conversation with persons awake and solve difficult problems; further, in those instances in which the dreamer knows while dreaming that he is dreaming.

The writer finds that most dreams are attended by emotion of some sort; it may be the emotion that would regularly attend the event in life or it may be quite the opposite. The dreams of childhood are characterized by the emotion of fear, but among adults the emotions seem to be about as complicated and various as in the waking state. Highly emotional dreams are not confined to any age, sex nor locality, though they seem to be most frequent in early childhood, puberty, and from eighteen to twenty-one years of age.

Half the persons answering the questions say that their dreams tend to repeat the undercurrents of their waking emotional life. Others say that dream emotions are just the opposite of those which would attend the actual event.

One of the things most clearly shown by the returns is that children almost universally and adults frequently confuse their dreams with real life. The cause of the confusion in childhood probably arises from the extreme credulity of children and from their limited memory store. The author points a moral in this connection, to the effect that what is often considered wilful falsehood among children and so punished, may be an honest confusion of a dream experience with a real event.

Moral tone in dreams seems to find no place until the tenth year. About this age the dreams of the night seem first to fashion themselves into punishments for the offences of the day. In childhood, the evil is apt to come in the form of the death of the child himself, the calamity is personal; later, the dreamed injury comes more often to friends and relatives. Such dreams may exert a very strong influence over the dreamer, even to the extent of complete inhibition of the wrong act.

In regard to the influences of dreams, there is considerable diversity. A large number say that they are not influenced by their dreams, others frankly admit that their mood and many of their acts for several hours after awakening are determined to a very appreciable extent by their dreams, particularly by the dreams of a highly emotional character.

The author is of the opinion that dreams have in the past played a far more important rôle in history than has been assigned them. The modern scientific attitude which seeks causes in natural phenomena, rather than in supernatural realms, has, of course, robbed dreams of much of their importance and influence.

While the above are the main points made by Mr. Jewell a number of interesting minor ones are suggested. Among these are the following:

1. Dreams may be prevented by suggestion and probably disappear just in proportion as the suggestion is complete.
2. Neither the season, day of week, nor the month has any noticeable effect on dreams, except for local setting, such as winter scenery being more common among the winter months.
3. Motor activity during sleep is distinctively a childish characteristic, though it often persists into adolescence and sometimes well into adult life.

4. Dreams differ markedly with respect to age and locality, and probably with respect to nationality as well.

5. Children dream of the events causing their great emotions very soon after their occurrence. * * * During later adolescence and adult life, the more importance an event assumes to the individual, as a general rule, the greater the length of time between its occurrence and its appearance in dreams.

6. There may be subconsciously injected into one's dreams an element of truth which he does not recognize as subjective, hence they may take on a supernatural cast.

GENEVIEVE SAVAGE MANCHESTER.

UNIVERSITY OF CALIFORNIA.

BOOKS RECEIVED FROM JUNE 5 TO JULY 5.

Physiologie et psychologie de l'attention. J. P. NAYRAC. Pref. by TH. RIBOT. Paris, Alcan, 1906. Pp. xii + 222. Fr. 3.75.

L'année philosophique, 16e année, 1905. Ed. by F. PILLON. Paris, Alcan, 1906. Pp. 304. Fr. 5.

The Development of Symbolic Logic. A. T. SHEARMAN. London, Williams & Norgate, 1906. Pp. xi + 242. 5/ net.

Leitfaden der Psychologie. TH. LIPPS. 2. Aufl. Leipzig, Engelmann, 1906. Pp. viii + 360. M. 9.

The Psychology of Association. F. ARNOLD. (Columbia Univ. Contr. to Philos. and Psychol.) New York, Science Press, 1906. Pp. v + 80.

The School and its Life. A Brief Discussion of the Principles of School Management and Organization. CHARLES B. GILBERT. New York, Boston and Chicago, Silver, Burdett & Co. (1906). Pp. viii + 259.

NOTES AND NEWS.

EDWIN DILLER STARBUCK, Ph.D., professor of education in Earlham College, Richmond, Ind., has been elected to the professorship of philosophy in the State University of Iowa.

AT a recent meeting of the board of regents of the State University of Iowa, the name of the department of philosophy was changed to *philosophy and psychology*. Dr. Daniel Starch has been elected instructor in philosophy and psychology at this university.

PROFESSOR IRVING KING, of Pratt Institute, Brooklyn, has been appointed assistant professor of education in the University of Michigan.

THE following items are taken from the press:

DR. KARL ROBERT EDOUARD VON HARTMANN, author of 'Die Philosophie des Unbewussten' and other philosophical works, died at Berlin on June 6, at the age of sixty-four years.

It is also reported that André Godfernaux, author of 'Le sentiment et la pensée,' died recently at Cannes. His recent writings were largely on the psychology of religion.

M. PIERRE JANET, professor of experimental psychology in the Collège de France, has been appointed lecturer at Harvard University next year and will give a course on the symptoms of hysteria.

DR. W. H. R. RIVERS delivered the Croonian lectures before the Royal College of Physicians of London on June 12-21, the subject being the action of drugs on fatigue.

DR. VIVIAN A. C. HENMON has been appointed lecturer in psychology at Barnard College, Columbia University.

AN independent lectureship in general and experimental psychology has been established at the University of Edinburgh in connection with the philosophical department. An appointment will be made in time to begin work next session.

It is reported that a general institute of psychology is to be established in Paris at an early date, to be devoted largely to the study of phenomena of subconsciousness, the causes of criminality, and means of combating social evils.

THE PSYCHOLOGICAL BULLETIN

THE CONTRACTION OF THE COLOR ZONES IN HYSTERIA AND IN NEURASTHENIA.¹

BY DR. J. W. BAIRD,
University of Illinois.

It is a well-known fact that certain nervous disorders may be attended by sensory disturbances. Diminished sensitivity to color is a prominent symptom; and the anæsthesia is usually described as a contraction of the retinal color zones. In acute stages of neurosis, these fields may contract to the vanishing point, leaving the retina wholly insensitive to color.

Investigators and practitioners have been interested in discovering what sequence is followed in this progressive contraction and ultimate disappearance of the color-zones. Besides being of diagnostic value, a knowledge of the progress of the disintegration of the color sense would probably enable one to read backward and obtain evidence on the phylogenesis of color perception.

The literature of the topic is scant and unsatisfactory. There is a vacillation and, in many instances, an utter disagreement among the discussions of the subject. And the details of experimentation are usually so vague as to preclude the possibility of reconciling the conflicting statements. One finds, on the whole, a consensus that the zones of red and of green are the first to disappear.² Yet many au-

¹ This number, dealing especially with pathology, has been prepared under the editorial care of Dr. Adolf Meyer.

² Thus Ch. Féré states that in epilepsy the green zone contracts most, red less and blue least of all. (Quoted by Otto Binswanger, in Nothnagel's *Specielle Pathologie u. Therapie*, 1904, XII., 1, S. 204.) Pichon, in 150 cases of epilepsy, also found a greater contraction for green than for red (*ibid.*). In atrophy of the optic nerve and in optic neuritis Jackson reports the same sequence of disappearance (Edward Jackson, *Diseases of the Eye*, Philadelphia, 1900, p. 392), while Ball gives red, green, blue, yellow as the order (*Modern Ophthalmology*,

thorities hold that pathological conditions of the nervous system are attended by a 'reversal' of the relative areas of the normal fields, and maintain that those zones which have the widest extension upon the normal retina are the first to disappear. This is tantamount to stating that the zones of blue and yellow disappear before those of red and green.¹ Must one infer that the gradual debilitation of the color-sense is characterized by a wholly irregular and non-uniform progression? Is it all a matter of individual idiosyncrasy of patient, or of type of disease causing the disintegration? Or shall one say that one is not yet in possession of the facts, and that the ground must be worked over again with more refined apparatus and methods?

It is a well-established fact that the zonal limits upon the normal retina are neither definite nor static. And indeed common sense would teach that the zone of any color tone is larger in proportion as the color stimulus employed in the exploration is brighter. Zonal area depends not upon color tone alone. The retinal limits within which the color of a stimulus may be perceived vary with variations in the brightness, in the saturation and in the area of the stimulus; they change with changes in the character of the background, in the conditions of retinal adaptation and of optic refraction. Every color zone of the normal retina may be narrowed down to the vanishing point, or may be extended to the outermost limits of the retina by an appropriate choice of conditions of exploration. It is obvious then that if one is to obtain *comparative* results, if one is to compare, *e. g.*, the relative areas of the zones of red and of green, one must take precautions to prevent either stimulus having an objective advantage over the other, as a physiological stimulus. In a word, one must choose color stimuli of equal brightness, saturation and area, and one must preserve uniform conditions of illumination (background), adaptation and refraction throughout the exploration. It seems probable that the

Philadelphia, 1904, p. 546). Sinkler (Wharton Sinkler in Loomis-Thompson's *System of Practical Medicine*, 1898, IV., p. 698) and Juler (H. E. Juler, *Handbook of Ophthalmic Science and Practice*, Philadelphia, 1904, p. 273) found the order of disappearance to be green, red, yellow, blue, in atrophy of the optic nerve and in hysteria. De Schweinitz (*Diseases of the Eye*, Philadelphia, 1903, p. 526) states that the usual sequence is green, red, blue, yellow, but cites exceptional cases in which red disappears first.

¹ Charcot, Parinaud and others state that in hysteria the red zone contracts most slowly and disappears last. And numerous authors have found that the field for red is even greater than that for white. Cf. Joseph Collins, in *Twentieth Century Practice of Medicine*, 1897, X., p. 464, and James M. Ball, *Modern Ophthalmology*, Philadelphia, 1904, p. 558.

confusion which one finds in the literature may be due to a failure to appreciate the significance of these coöperating factors.

The present paper is chiefly concerned with the exploration of the retinas of a number of hysterical and neurasthenic patients. Normal records, obtained under identical conditions of experimentation are introduced for comparison. The investigation was conducted in the Johns Hopkins Hospital. The writer is under obligation to Professor L. F. Barker, to Dr. C. P. Emerson and to Dr. B. A. Cohoe, of the hospital staff, for suggestions and for other aid. The explorations were made in diffuse daylight, and the apparatus employed was a campimeter with Hegg's sets of color discs.¹

These discs are furnished in three sizes — 6 mm., 13 mm. and 23 mm. in diameter. The accompanying tables contain records obtained with the largest and the smallest sizes. The background employed in the experiments was a strip of Hering gray paper 50 cm. wide and 3 m. long; upon this was marked a graduated scale for convenience in reading the determinations of zonal limits. At the center of the strip was pasted a disc of white paper, 5 mm. in diameter, which served as the fixation-point. An adjustable head-rest, secured at a distance of 1 m. from the fixation-point, completed the apparatus.

The observers were first tested as to normality of color vision by means of the Holmgren worsteds, and all were found to be normal. In the exploration experiments the color stimulus was brought in, along the background, toward the fixation point. Frequent pauses were made to prevent fatigue. The observer was always in ignorance of the color of the stimulus about to be employed. The point at which the color first appeared was taken to indicate the limit of the color zone. Three explorations were made with each color disc; the averages of the three readings, expressed in the nearest whole number, are set down in the following tables. The readings were reduced to degrees by a graphic method. The experiments were confined to the horizontal meridian — temporal and nasal, and both retinas were explored.

¹ Emil Hegg, *La périmétrie des couleurs*, *Annales d'Oculistique*, CIX., 1893, pp. 321 ff. *Sur la périmétrie au moyen de pigments colorés*, *Ann. d'Oc.*, CXI., 1894, pp. 122 ff. Hegg first established those colors which do not change in tone in indirect vision. Then he had a painter prepare mixtures of oil pigments which exactly reproduce the four stable tones in equal saturation and brightness. Hegg has put upon the market sets of discs, in three sizes, painted with the pigments described. The author is indebted to Mrs. C. Ladd Franklin, of the Johns Hopkins University, for the use of her sets of the Hegg discs.

The following tables show the horizontal extension of the zones which were sensitive to the stable colors, — purplish-red (*R*), bluish-green (*G*), blue (*B*) and yellow (*Y*).

TABLE I.
STIMULUS DISC, 23 MM. IN DIAMETER.

			Right Eye.		Left Eye.	
			Nasal Meridian.	Temporal Meridian.	Nasal Meridian.	Temporal Meridian.
			Degrees.	Degrees.	Degrees.	Degrees.
Patient 1.	HYSTERIA.	R.	28	20	27	23
		G.	27	21	26	23
		B.	42	26	42	29
		Y.	40	26	45	28
Patient 2.	NEURASTHENIA.	R.	22	13	25	14
		G.	24	14	24	15
		B.	33	24	35	22
		Y.	32	24	32	23
Patient 3.	NEURASTHENIA.	R.	31	19	27	20
		G.	30	18	27	19
		B.	41	25	36	26
		Y.	40	25	39	25
Patient 4.	NEURASTHENIA.	R.	26	20	29	22
		G.	28	19	28	21
		B.	36	27	38	30
		Y.	35	26	36	29
Patient 5.	NEURASTHENIA.	R.	25	19	28	20
		G.	26	20	28	20
		B.	33	26	35	26
		Y.	31	26	35	25
Patient 6.	NEURASTHENIA. (Sexual.)	R.	27	23	30	25
		G.	27	22	30	24
		B.	34	27	41	30
		Y.	35	27	39	30
Patient 7.	POST-TYPHOID PSYCHOSIS.	R.	12	10	21	14
		G.	11	11	20	13
		B.	24	18	30	20
		Y.	22	17	29	20
Observer A.	NORMAL.	R.	32	22	30	21
		G.	33	22	29	21
		B.	40	27	41	29
		Y.	40	28	39	30
Observer B.	NORMAL.	R.	29	20	30	22
		G.	30	21	31	22
		B.	39	29	40	31
		Y.	38	31	38	31
Observer C.	NORMAL.	R.	35	24	33	23
		G.	34	26	33	24
		B.	43	34	42	34
		Y.	42	34	40	36

TABLE II.

STIMULUS DISC, 6 MM. IN DIAMETER.

			Right Eye.		Left Eye.	
			Nasal Meridian.	Temporal Meridian.	Nasal Meridian.	Temporal Meridian.
			Degrees.	Degrees.	Degrees.	Degrees.
Patient 2.	NEURASTHENIA.	R.	*	10	*	10
		G.	*	10	*	12
		B.	23	19	24	18
		Y.	24	20	22	19
Patient 7.	POST-TYPHOID PSYCHOSIS.	R.	0	0	0	0
		G.	0	0	0	0
		B.	4	2	8	4
		Y.	6	4	8	6
Patient 8.	HYSTERIA. (Hysterical epilepsy.)	R.	8	6	9	7
		G.	8	6	8	7
		B.	*	10	*	10
		Y.	*	9	*	10
Observer A.	NORMAL.	R.	11	6	9	7
		G.	10	6	9	7
		B.	*	10	*	10
		Y.	*	9	*	10
Observer B.	NORMAL.	R.	10	9	11	9
		G.	10	10	10	10
		B.	*	17	*	17
		Y.	*	17	*	19

* Upon these meridians the outermost limit at which the color was recognized coincided with the edge of the blind-spot (about 12°). These readings are not tabulated for the reason that they represent an irregular and extraordinary condition of retinal sensitivity.

The most prominent features of these results are :

1. The color zones of the abnormal subjects examined are, on the whole, of smaller area than those of the normal subjects. This contraction is not common to all of the patients, *i. e.*, it is not an invariable symptom of the types of disorder represented by these patients. But it appears in the grand averages of all the results where one finds that the 'patients' zones have but 83 per cent. of the width of the 'observers' zones. And it is especially noticeable in the records of patients 2, 4, 5 and 7.

2. Wherever a contraction of the color zones has occurred it has followed a definite and regular order: (a) The narrowing of the red zone has gone hand in hand with that of the green zone, while that of the blue and that of the yellow zones have also kept pace with

each other.¹ (*b*) There is a greater degree of contraction in the red-green zone than in the blue-yellow zone. There is a slight indication of this in the grand averages, but it is particularly noticeable in the records of patients 1 and 7. Indeed when the exploration was made with discs of relatively slight stimulating power (Patient 7, Table II.), it was found that the color of the red and the green were no longer perceptible, while the blue and the yellow were still distinctly recognizable. Our results show the presence of a well marked tendency for the red-green zone to contract more rapidly than the blue-yellow zone; and in one instance there is a clear indication that the blue-yellow sense would continue to function after the red-green sense had wholly disappeared.²

¹ An apparent exception to this is to be found in the records of Patient 7, Table II., where the yellow was usually recognized farther out on the retina than the blue. This feature is unquestionably due to the influence of the macular pigmentation which absorbs blue light.

² This latter feature cannot be referred to the yellowish pigmentation of the macula. A series of experiments with stimuli of the same color tones showed that the normal fovea is more sensitive to the red than any other part of the retina. Nor can there be any doubt as to freedom from red-green blindness (see record of Patient 7, Table I.).

THE RELATION OF EMOTIONAL AND INTELLECTUAL FUNCTIONS IN PARANOIA AND IN OBSESSIONS.

BY DR. ADOLF MEYER,

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Any unsophisticated student and observer who has followed the literature on paranoia during the last ten years, has had some reason to wonder why such emphasis was put on the question whether paranoia was fundamentally an intellectual or an emotional disorder. I never could see much use in the discussion except insofar as it illustrated the doubtful definition of the distinction of emotion and intellectual function as soon as one left the most striking examples of the one type and the other and got into a zone of mixed and doubtful conditions. It is easy to see that it is wise and inevitable to emphasize the emotional nature of a fright and the merely intellectual nature of my present use of the word fright, or the intellectual nature of the sensation of a red line and the emotional feature of the reaction to a flash of lightning. But in many mental happenings the two belong together in a way that makes a ripping apart, or even emphasis of the one or the other, unprofitable and dogmatic. A study of paranoia by Bleuler, with a reply by Berze, and a review on obsessions by Bumke, furnish material for a ventilation of the possible reasons for the perennial dispute and for an admission of heresy.

Broadly speaking, almost every mental activity allows us to recognize relations to two fundamental systems, that of the shaping of the personal physio-psychological ('emotional') attitudes of our circulatory, respiratory and vegetative side, and that of the more fleeting and more impersonal neuro-muscular ('intellectual') relations, based on the sense organs *per se* and the muscular apparatus carrying and directing them. Or, to speak in other terms, almost every mental activity implies an adjustment of the emotional attitude (that balance which is attended to largely by the sympathetic nervous mechanisms and their central connections), and an adjustment within the intellectual system (the apparatus of sensations and ideational relations). The moving entities or 'idéés-forces' are, however, compounds, which we

must have the courage to use as units for what they are worth without allowing ourselves to be distracted by endless quibbling over the nature of components and their real functional relations. We must learn to work again with complexes and provisional biological entities instead of assuming merely arithmetical relations between postulated fragments of the situations. There are some important relations about which we cannot afford to have finally settled ideas, and among these stands foremost the relation of the emotional and the intellectual aspects of mental activities. By dealing modestly with *situations* as they present themselves and for what they are worth, we can use them in our work and draw just as valid inferences and we may hope to keep nearer the fundamental science, biology, and its utilization.

We frequently hear of patients awakening with a feeling of indefinite anxiety or sadness or nervousness which we cannot class otherwise than as emotional states, while at other times these same patients attach their emotional attitudes to special events, or to anticipations of definite events: the thought of the death of a friend, or the thought of ill-will or persecution from another person, or the memory of a perfectly irrelevant fact of absolutely insufficient bearing, as in the case of a woman who fretted over having disgraced herself and her family by exposing a slightly soiled petticoat in getting into a buggy, or some other plainly incidental food for her fundamental uneasiness and agitated despair. Or we hear a patient complain of the annoyance of hearing an imaginary orchestra play and occupy his attention, so as to drive him to distraction. Here the fundamental fact is his uncontrollable musical imagination with the vividness and independence of a hypnagogic hallucination, and the distress is largely present owing to collision of the musical drift with the ordinary and more important and pressing interests of the person. But there are many instances where the predominance of the emotional trend or of the intellectual side is far less conspicuous and more variable and the whole event none the less plainly a vital factor in the determination of the patient's conduct and trend of mentation. In practice we weigh the emotional factor and the purely intellectual one of such constellations as jealousy, or anxiety, or uneasiness, without, however, assuming that there would be any advantage in pushing the analysis so far as to have one mass of pure emotion and one mass of pure intellectual processes.

Emotional and intellectual determinants are frequently worth weighing independently for their different bearing as well as for the fact that different parts of our organism are involved. Yet empirically we deal with the situation as with a compound which loses its essential traits by

decomposition, and we must be ready to deal with such compounds for what they are worth and likely to mean in the stream of events without distracting ourselves over temporarily irrelevant questions. When we have to study the physical relations and properties of certain substances and bodies, to load ourselves down with chemical discriminations would be a useless accumulation of ballast. In empirical psychology we stand as it were on grounds of the more relational science of physics. Even within their proper domain of analytical psychology we have good reasons to doubt that an analytic knowledge of elements can have any such claim to justification by results as the elements in chemistry deserve. The psychic 'elements' are the most detailed and refined products of differentiation and so numerous that work with these 'elements' is quite a different proposition. It is quite possible that the psychological elements had better be dropped as essentials of a *dynamic* psychology, and that the maintenance of the sharp division of sensation, idea, emotion and will is not worth the effort, except in their proper place and sphere, especially when we inquire into the specific participation of definite sense-organs and nervous mechanisms for our neurological diagnoses. A paranoia would no doubt be the same process in a blind deaf-mute and in a person with lesion of both pyramidal tracts. Its interest lies much less in the elements 'sensation' and 'volition' than in the existence of peculiar complexes and arrangements of 'idéés-forces.'

Since the days of Westphal distinctions have been canonized between disorders primarily of the emotional field of mental activity, and disorders primarily of the intellectual field. In the somewhat bewildering domain of psychology a clean-cut and apparently simple contrast is a veritable godsend, and once established in a mind it becomes a path of least resistance just as some contrasts enslave the mind of the struggling tyro in composition who falls back on the 'internal' and the 'external' reasons of things and similar trite formulas of roads to thought. The formula lingers apparently as a stimulus to thought. In reality it leads to usually gratuitous discussions, and stands in the way of broader perspectives, until independent instincts crowd out the obstacle. There is no doubt but that the contrast of emotional and intellectual features of mental activities has a certain practical foundation. But the dogmatic division of emotion and intellect leads to unintelligible conflicts. An excellent illustration of this calamity in psychopathology is given by Ziehen who, after opposing psychoses 'without intellectual defect' to those 'with defect,' contrasts among the simple psychoses the *affective* psychoses (mania

and melancholia) with the *intellectual* psychoses (stupidity, paranoia, dreamy states, symptomatic deliria, and obsessions and impulsions and psychopathic constitutions). The unsophisticated reader will, no doubt, suspect behind it all some reason, in Ziehen's system of psychology. We might understand the tendency to oppose the more localizable side of mental facts (the sensations with their physical stimuli and accepted cortical substrata) to the non-localizable general emotional reactions, or something like this. As a matter of fact the above division is largely empirical. Ziehen (*Psychiatrie*, p. 5) admits "but two psychological elements, sensation and concept. The only process which works with both is the association of ideas. Its product is action." There are no special 'mental powers,' no need of a special 'will,' nor a special apperceptive power, nor special emotional powers. Emotions are never isolated, but always attached to sensations and concepts, as parts of the same.¹ Yet few alienists perpetuate Westphal's distinction of primary and secondary emotions more than Ziehen. This inconsistency in recognizing *primary* emotional disturbances does not seem to even disturb such a forbidding intellectualistic system as that of Ziehen.

The whole embarrassment comes from the lingering dogmas concerning the relation of intellectual and emotional data and is a veritable spook which haunts the thoughts and writings of some of the most productive and independent writers, and it will do so until it is thoroughly exposed to daylight. It is a question of the doctor taking his own medicine, if we recommend the modern psycho-analytic method as a therapeutic measure in this difficulty. Some clearness on this issue is one of the first steps towards making dynamic conceptions possible in psychopathology.

A review of this issue is by no means merely a work of destruction of idols and criticism. We are in a period of reconstruction, or rather of construction, and the psycho-pathologists' problem in this field may possibly be of some interest in connection with the discussion on the topic of 'feeling' brought out at the last meeting of the American Psychological Association. We deal with a very concrete field, and any way of establishing closer contact with events as they present themselves in life and the theoretical considerations is bound to bring the reader into touch with actual experiences, and to relax temporarily the systematic interests which become so prominent if the discussion is largely one of nomenclature.

¹ With most of this we would agree, if he would also surrender sensations and concepts to their modest position of abstracts.

I have chosen two representatives as text of this analysis, — Bleuler's attractive and stimulating pamphlet on Affectivity, Suggestibility and Paranoia,¹ as the constructive element, and Bumke's 'Was sind Zwangsvorgänge?'² in many ways an excellent review, as a sort of *reductio ad absurdum* of dogmatic purism.

The topics of Bleuler's study seem, at first sight, rather heterogeneous. He treats first of affectivity, next of suggestion, and finally applies his results to the psychology of paranoia. I render here his own résumé, as probably the fairest way of doing justice to his ideas; but in some places I shall introduce brief references to the material of the full paper, so as to make the reader somewhat familiar with the evidence on which he builds. Bleuler first attempts to define affectivity. "Affectivity is to be sharply distinguished from those feelings which really are intellectual processes." Nahlow'sky's intellectual feelings are thus disposed of as intellectual processes, *e. g.*, the vague and hazy impressions and suppositions; Janet's feeling of strangeness, of novelty, of familiarity, of incompleteness, etc., and Lipps's feeling of certainty, of truth or of probability, or the patient's feeling of suspicions (which is not a feeling of one's being suspicious, but an impression that somebody's acts or attitude are threatening evil); furthermore the feeling of sadness, if by that we mean the realization of one's being sad.

"Whether I feel my bowels or not, whether I have a feeling of certainty, of suspicion, is quite irrelevant for my psyche as long as no affect is added. As soon as an affect appears, it governs at once the entire psyche." This explains, I think, how Bleuler comes to say that somatic as well as other sensations, intracentral processes such as the feeling of certainty or probability, or the feeling of being sad or blind, or hazy suppositions and other 'intellectual feelings,' are 'toto cælo' different from the feelings of pleasure and pain, and from true affectivity. "Hunger, thirst, pain, etc., are mixtures of intellectual and affective processes, and contain a sensation and a feeling determined by it. Other somatic sensations, such as the feeling of tension of our muscles, have additional relations to affectivity inasmuch as they form an integral part of the symptomatology of affects.

"Only the affectivity in the narrower sense has the well-known

¹ E. Bleuler, *Affektivität, Suggestibilität, Paranoia*. Halle, Carl Marhold, 1906.

² Bumke, 'Was sind Zwangsvorgänge?', *Sammlung zwangsloser Abhandlungen aus dem Gebiete der Nerven- und Geisteskrankheiten*, Vol. IV., No. 8. Halle, C. Marhold, 1906.

effects on the functions of the body (tears, heart, respiration), as well as on the inhibition and facilitation of thoughts, in the normal and abnormal condition. It is the pushing element in our actions. Through it the reaction to an isolated sensory impression is spread over the entire body and the entire mind, opposing tendencies are eliminated, and the reaction thus receives its extent and force. It determines a coördinated activity of all our nervous and psychic organs. It also reinforces the reaction from the point of view of time, by giving to a definite direction of activity a duration lasting beyond the primary impetus. It is, broadly speaking, the element which supplies the impetus to our activities. It is the cause of a great many dissociations and transformations of our ego, of certain forms of deliria, etc.

“Affectivity shows a certain independence as compared with the intellectual processes, inasmuch as affects can be transferred from one process to another, and inasmuch as different persons react so differently to the same intellectual processes that it is impossible to put forth rules of affectivity. Moreover, in the child the development of affectivity is quite independent from that of the intellect.

“There evidently are different *types* with regard to their manner of reaction to strongly affective processes. Unfortunately, they have not yet been studied. It is, however, quite possible that it depends on such differences in the mode of reaction whether an individual will become hysterical or paranoic, or develop another one of the disorders which we provisionally call functional.

“*Attention* presents itself as an aspect of affectivity [as a special type of effects of affectivity]. It directs the associations in exactly the same sense as the feelings, and it does not occur without affects. In pathological states it changes in exactly the same sense as the feelings.

“In a child [Bleuler gives a number of excellent observations on his own and other children of very complex responses in which he claims a far-reaching independence of the affective development] the feelings (and affects) can so thoroughly take the place of reasoning that the result of the affective facilitation and obstruction equals that of complicated logic. These are the so-called *instinctive reactions*.

“In *pathology* the abnormalities of affectivity govern entire disease-pictures. In organic psychoses affectivity is by no means obliterated, as is often claimed; on the contrary, it reacts more readily than in the normal. The obliteration is apparently secondary and due to the reduction of intelligence. As soon as a complex concept can no longer be formed or grasped entirely, we naturally cannot expect an affective reaction corresponding to it.

"This holds similarly for alcoholics, whereas in epileptics the affectivity is preserved but shows a marked perseveration instead of the unstable equilibrium in the organic diseases.

"In idiocy we find all kinds of types of affectivity as in the normal, only within even wider limits. In dementia præcox the affects are suppressed in a definite manner; but their effects are still demonstrable."

Throughout this description we miss many standard problems which we find usually discussed under the caption emotions (Bleuler briefly discusses them at the end of the chapter), and find, instead, matters which are usually looked upon as a *feature of all activities*, but claimed here as the prototype of affectivity. 'Affectivity is that broader concept of which will and conation are but one aspect' (p. 17), and this is further illustrated by the quotation: 'Man preaches what he thinks, he does what he feels.' The drift of affective life is adjusted by as yet poorly studied mechanisms, and, especially in the intelligent and cultivated, by impressions from the past and still more plainly from the future; worry and hope determine a great share of one's present activity. From the pathological side Bleuler gives good illustrations of this in the form of 'wish dreams,' of 'wish-delirium,' of 'wish hysteria,' of convenient and wished-for illness. These lead over to suggestion and autosuggestion, and to the peculiar 'displacements' and 'conversions' in the sense of Freud, used for the suppression of the unpleasant, and of great importance in the explanation of hysteria, obsessions and dementia præcox. Bleuler admits here his full acceptance of the nomenclature and general attitude in psycho-pathology of Freud; and emphasizes the peculiar ways in which affectivity achieves the autosuggestion, and a number of other 'mechanisms' (p. 21).

In his discussion of the relative independence of affectivity, Bleuler furnishes rich material offsetting the unconvincing dogmatic presentation of those who speak of 'feeling-tone' merely, and leave the factors of the drift of association not further analyzed or accounted for. In this he seems to me to be in line with a tendency inevitable with those who wish psychology to be a study of the determining factors of the stream of mental life, and not merely an analysis of abstract and forceless epithets and epiphenomena. It is a movement intimated in many places and already clearly provided with the designation 'dynamic psychology' in Thorndike's *Elements of Psychology*. Bleuler's plea for that which we would call the dynamic rôle of 'affectivity' is a wholesome call for a recasting of values and an emancipation from the set conceptions which have so far repressed the dynamic viewpoint.

Bleuler himself considers the dynamic conception premature (p. 32). He disputes Fechner's claim of having measured the strength of psychic processes; 'affectivity alone and its manifestations appear to us as intensive or quantitative magnitudes; we size up its strength, but cannot measure it as yet, and have no knowledge of what determines it.' Yet he adds: "We therefore have no possibility as yet to found dynamic theories and even little cause to search for them. It is, however, true that a better knowledge of the physiological basis of our psychic life will some day bring the dynamic factor into the discussion." These efforts, Bleuler justly remarks, will, however, have little in common with the pseudo-dynamics of the questionable theories which claim that sensation is 'the same thing as idea,' but 'of greater intensity,' and *therefore* hallucinations of more powerful influence than ideas. Bleuler mentions this claim as an illustration of the precocity of dynamic conceptions. It would seem better to say that these dynamic differentiations are largely speculative and that true dynamic psychology will have to start with the 'force' of actual events, without much concern for the traditional definitions of sensation, ideas, feelings, etc., but with due respect for what would appear as moving factors. Mere comparisons of the 'strength' of sensations, idea and hallucinations are based on considerations of abstract entities and appear altogether speculative and not the proper material for investigation to start on.

Whether Bleuler has made it altogether clear what affectivity is, in his sense, is not certain, and it may be just as well that we have no final formula for it. The abstract does not render his numerous wholesome and homely materials for inferences which well deserve to be read in the original. They suggest a struggle for emancipation. This is certain, that Bleuler consciously or unconsciously encourages an emancipated study of a number of mental reactions slighted by intellectualism; but he maintains his very emphatic differentiation of intellectual feelings and affectivity, while the general broad meaning of *his use of 'affectivity' suggests even an emancipation of the concept from the pleasure and pain paradigms.* 'The feelings of pleasure and pain, to which we must add the affects, the affectivity,' makes his attitude less plain than when he says, in his interesting discussion of association (p. 29-32): 'Attention is therefore nothing but a special instance of results of affect.' Or still better, when he contrasts intellectual and affective processes in their ontogenesis (p. 33): Intelligence, as a mere form of combining memory images, is, no doubt, developed at birth; the child merely lacks the contents of

experience. Affectivity also exists; it, however, demands no content, no material from the outside; experience furnishes merely the occasion to the production of the affect. "It, therefore, can express itself from the very start in all its complications and finesse (naturally with the exception of the sexual sphere, although perhaps even there to some extent, as Freud shows)."

It is easy to see that his interesting samples of largely 'affective' reactions in children are a striking mixture of experience and readiness for distinct responses. If he emphasizes the affective nature of these responses, he approaches them to the instinctive reactions, and thereby comes near to identify 'affectivity' with *the main-spring of all responsiveness and activity which is not purely mechanical or reflex.*

That Bleuler takes up the discussion of *suggestion*, is natural and might also be called a corroboration of the imputation of a dynamic tendency. He sees in it 'an affective process'; suggestibility is a part phenomenon of affectivity; the intellectual feelings, faith, etc., can only produce physical changes and hallucinations and disruption of logic through the intermediary of an affect; suggestion can directly govern the activity of glands, of the heart, of vasomotors, of the intestine, split off certain complexes of ideas from their antagonists, preclude criticism and dictate illusions and even positive and negative hallucinations to the senses. This is more than the effect of credulity of Bernheim; the *affect* accompanying the suggestion and roused by it is the spring of action. "Suggestibility is for a community what the affect is for the individual. It assures unity and consistence of activity and a 'collective' affect. Like the affect in children, suggestibility is active before intelligence. The greater the affective value of an idea, the more infective or communicable it is." Not all imitation (such as the unpremeditated imitation of the movement of another) is worth being called the product of suggestion. Hypnotic suggestion presupposes a state of fascination, 'the affective significance of which, it is true, is not clear yet.' To this Bleuler adds in a foot-note: 'Vogt ignores this affect when he demands that hypnotic suggestion must be free of affect.' The effect of autosuggestion can justly be described as effect of affectivity. The relation to attention and to pain-sensation is identical; but our knowledge of suggestibility and affectivity is not sufficiently definite as yet to connect the greater or less suggestibility with the presence or absence of a definite fund of affectivity. For many reasons a community is more suggestible than an individual. Suggestion never occurs pure and wholly uninfluenced by other psychic mechanisms; it is an aspect of affectivity.

The whole chapter is full of interesting discussions of detail. The main lines quoted make plain that the focus of interest lies with the *dynamic principle* of the process, and in the demonstration of unity with the dynamic principle of mental life generally. This at least is the line of stimulation along which the reviewer gets the greatest satisfaction from the very interesting but not otherwise clearly pointed chapter.

Bleuler then passes rather abruptly to the discussion of paranoia. He revives and extends a criticism he gave of Specht, who made the 'affect of mistrust or suspicion' the foundation of paranoia (which is defined as the isolated gradual development of an 'unshakable delusion-system with perfect retention of clearness and order of thought, volition and action'). Specht, with whom Bleuler sympathizes on many points, is criticised for attempting an assailable generalization when he claimed that the 'affect of mistrust' is a mixture of pleasure and pain feelings; that 'therefore' it occurs during the transition of mania or melancholia into its opposite or into recovery, and that it makes of paranoia the 'third functional psychosis besides mania and melancholia.'

Bleuler maintains that 'mistrust is not an affect' (Specht wisely speaks of the affect *of* mistrust and would thus make much of Bleuler's analysis of mistrust *as such* unnecessary), that it is not a mixture of pleasure and pain (which claim of Specht's is hardly to be taxed as more than one along the lines of least resistance, the rut of an excessively simplified psychology of emotion), and that paranoia can in no way be classed with the affective psychoses, but is something wholly different.¹ "A general and primary disorder of affect is in no way demonstrated as yet in paranoia." The affective disorders which do occur with it are 'secondary' consequences of delusions. Paranoia is equally devoid of a general disorder of perception or apperception (Berze), or a general alteration of the memory-images (an assumption of Sandberg). Nor is the hypertrophy of the ego (Tiling) demonstrated as a regular symptom of paranoia. The egocentric character in paranoia is merely a consequence of the 'continual prominence of an affectful complex of ideas.' As in the normal, such a complex determines a prevailing attitude. Inasmuch as many matters which have no relation to the patient become erroneously related to the complex, "delusions of reference or of interpretation arise. The ego

¹ Although the term *affective psychosis* anyhow is a misleading one, inasmuch as the prototype 'manic-depressive insanity' is by no means wholly explained by the emotional disturbance (in the sense of pleasure and pain). In many cases they are quite subordinate.

appears hypertrophic through the affective complexes. Under the influence of a chronic affect connected with the said complex, errors occur just as in a normal person under similar emotion. *The pathological feature consists in the incorrigible nature or fixation of the errors and their progression.* What determines this feature is not explained yet. It may be due to an 'anatomical or chemical foundation,' or it may be 'functional' where the affectivity is increased in a certain direction, or is too persistently active, or where the affect is kept alive by some tear or break in the life of the patient. As long as we do not know the underlying process we cannot say whether paranoia really comprehends an essential and unitary disease-entity. Megalomania and persecutory paranoia might be fundamentally different diseases. On the other hand it is possible that certain hallucinatory forms might be identical with the ordinary forms of paranoia."

The 63 pages devoted to paranoia contain a wealth of very fascinating material hardly intimated by this brief summary. Bleuler describes a few cases to illustrate the relation of delusion and affect.

The first case is that of a bright woman whose opportunities were unsettled by the bankruptcy of her father, and who finally after some trying experiences established herself with her mother in a prosperous but taxing pursuit (making a special kind of desserts and sweets). In 1888, at the age of 35, when her best peddler became sick, she began to worry over her prospects, did not seem to see a way out of the calamity, and at the same time she had an idea that certain people would be rather pleased to see her in trouble. The peddler recovered, and the worry and the rudimentary idea of persecution passed away. The following year the rather sudden death of her peddler upset her. She lost her grasp on her possibilities, made a contract to undertake a working branch of a grocery, but gave it up the next day. She was sure of ruin. She became fussy about the work, thought the customers did not really want to buy from her. Notions developed, such as even normal individuals might have under similar circumstances. She referred casual utterances to herself. Remarks of the minister and of neighbors, on closer consideration and after a short period of incubation, were misinterpreted. In the kitchen she felt herself observed, perhaps by a mirror (these ideas were later corrected). In 1891, she was upset by a new venture, expressed ideas of suicide, was brought to the hospital, as a melancholia with suicidal inclination—she urged to be discharged; 'the hospital had nothing for her to do'; she felt secretly observed; after a while she was occupied with copying, and finally discharged as paranoia, improved. Later there occurred

much worry, usually with self-accusation and a tendency to point to ill-will of others. She thought her relatives suspected that family quarrels were due to her; her opponents plotted to ruin her and asked the ministers to preach against her, how she might have done better. She worked rather uneasily, made a number of attempts at suicide. In the hospital from 1898, she behaved in a perfectly orderly manner, worked, but continued to feel that she gets what she deserved — that Dr. Bleuler would telephone to the minister whenever she went to church, etc., and numerous poorly related ideas of reference. Bleuler claims that the first thing was the occurrence of misconceptions such as might also occur in the healthy under similar affects, and subordination of various experiences to a complex of ideas kept alive by affect and the general trend of ideas. Only the fixation of the error is pathological; fixation turns it into a delusion, and this and its spreading constitutes the paranoia.

The second case, born 1865, a clerk, had an excess of \$20 in his accounts in 1896 (possibly to test his honesty), — and sometime later a deficit of 50 Fr. which was not questioned by the authorities. In 1899 another deficit of 40 Fr. occurred which he tried to cover up by falsifying the accounts. From that time self-reproach of early masturbation and these financial irregularities, ideas of reference, certainty that he would be taken to court, retrospective falsification, such as the claim that the death of a lady friend 18 years previous had been caused by a malicious nurse.

The third case was a capable draughtsman with lofty schemes, but without energy and with too much sensitiveness. Evasion of persecutions, continual discrepancy between desire and execution. Vagrant existence, finally alcoholism, shooting of a prosecutor, claims of inventions, etc.

The fourth case is that of a dullard, who married a Catholic woman with whom he had lived illegitimately. He worried over not having asked his minister, and one day he failed to salute him; and once later he failed to salute his employer; after that he developed the obsession to salute everybody, and the conviction that God had put upon him the duty of salutation, as punishment for his sins (masturbation, the marriage to a Catholic without consultation of the parson and the lack of respect to his employer). Excessive modesty. Not a trace of dementia præcox features. Temporary improvement.

In all these cases a *complex of ideas with marked emotional value* is said to form the starting point of the delusion and perhaps of the paranoia. While Wernicke considers these 'dominant ideas' a suf-

ficient explanation, Bleuler is convinced that most cases show, moreover, a constitutional disposition, and further, frequently, chains of predisposing experiences in the sense of Freud. Even in a normal individual certain situations, such as examination times, produce absolutely abnormal attitudes. A candidate misreads a rather illegible invitation to dinner by his examiner as an announcement of his being plucked! Even in paranoia there is 'no need' of a special affect of suspicion, of an apperception disorder, or other hypothetical factors.

The non-correction of such errors would seem to depend on a disposition, temporary or lasting. Especially a radical break in the career may be a factor. The possibility of a dementia præcox being superadded cannot be denied absolutely. The decline of paranoia is, however, quite different from a dementia. 'Real dementia' is 'invariably' due to factors outside of paranoia. Besides the affective disposition there is also an intellectual disposition, shown in a certain haziness and confusion of ideation. Bleuler further contrasts two cases in which the relations of paranoia and imbecility was in question.

The acknowledgment of fundamental importance of the 'gefühlbetonte Komplexe' or affective complexes leads Bleuler to attempt a classification of the types into those of persecution, megalomania (hardly ever physical as in mania or general paralysis, but frequently scientific, religious or political, or with the idea of prominent descent), erotic and jealous tendencies, the question of health in the form of hypochondriasis (perhaps even as a traumatic neurosis). Bleuler misses but one prominent complex, *i. e.*, that of the desire for progeny, for which I could supply an instance, although as a rule the disorders in the sexual ambitions gradually spread over a wider field than Bleuler wishes to include in his orthodox Kraepelinian definition.

We thus find an emphatic objection, not so much against the emphasis on the emotional weight of the central complex in paranoia, as against a somewhat schematic postulation of an affect of mistrust, of tense expectation, etc. On this point Bleuler is carried rather far from his own standpoint. Bleuler claims a pure intellectual process when he sees a suspicious individual with a revolver who makes him get ready for an assault, and when he adduces as proof of the absence of affect in the suspicion that he can describe the situation without speaking of an affect, in purely intellectual expressions, and that the amount of affect may vary without a change in the fact of suspicion. In this, he discusses the *word* suspicion rather than the situation, and then concludes that paranoia cannot be allied to the affect-psychoses, but must be something wholly different.

When I review my observations of paranoia, I find that there are a greater number than Bleuler seems to admit in which the fundamental attitude was for a fairly long time an *uneasiness* with *vague* suspicions, and a *vague* readiness to see in a rather great variety of things material for the suspicions, until gradually the dominant direction asserted itself. In many cases, the lasting delusional complex governs the situation from the start, but only intellectually if we may say so; affectively, there is as a rule the same *vague* unsettled and uneasy feeling, with a decided deviation of the broad field of affectivity from the normal consistency and harmony of trend and instinct (the functional sum of *idées-forces*). There remains the fact that there are cases in which without sufficient cause states of mind arise which are to all intents and purposes the affective attitudes of the paranoic, but without any definite content, an attitude of vague uneasiness, of a feeling of loss of true adjustment with the environment, that 'meine Ruhe ist hin,' in all its versions, from self-reproach to suspicion, anticipation, etc. What stamps them as paranoic is the inaccessibility to the usual relief of unbalanced states, the fact that they do not produce deep disorders of the stream of thought, apart from the general, perhaps specific, diversion of attention and constructive imagination, *i. e.*, their definition lies in the entire complex situation. In one phase it may be the general affective state, in another a situation better described in terms of a delusional complex (but not the less affective), and under no circumstances can we dispute the weight of a fundamental disruption of the affective apparatus, a disruption of the normal instincts.

May we assume for a moment the *possibility* of paranoia being a circumscribed affect-psychosis? In most cases of paranoia we meet with a complex in which it is difficult to determine a purely intellectual defect. The mere 'facts' of the delusions are more or less correct; but the inferences? Even they appear logical but rouse wrong valuations. But what are valuations if not essentially tied to affectivity, *i. e.*, to the instinctive reaction of certainty or doubt? What determines the *idée-force* of doubt if not the presence or absence of a certain uneasiness and hunger for adjustment? Why should we all of a sudden draw the line of affectivity when we approach the intellectual feelings?

The whole discussion has a value if it leads to heuristic results. If Bleuler's working hypothesis leads to facts which prove the existence of corrigible or fatal flaws in the reasoning, without disorder of the affective side, but nevertheless paranoia, the finding is an addition to our knowledge. At present we should designate such cases as *freaks*

of make-up, if they are conceivable at all. If the appreciation of the affective difficulty draws attention to avenues for the saving of the fallible intellectual frame from miscarriage, the study of the *affective* side will deserve emphasis. Considering that affectivity is the moving and determining principle, and intellect the static apparatus, we had reasons to *welcome* the emphasis on the affectivity even in paranoia, and may be able to make the facts useful in dealing with the beginnings of the condition in paying more attention to the affects than to reasoning.

If, further, in the differential analysis of the factor determining the fixation of the disturbance, special perspectives of affectivity, intellect and volition prove of value in addition to the search for physiological and general biological components of the constellation, we can use them systematically for what they are worth without any barriers. From the point of view of *nosological* differentiation, we may trust that we have safely passed the period when anything short of a comprehensive biological sizing-up could be considered safe ground for conclusions; but even there we have reasons to expect special help from an empirical sizing-up of the 'idéés-forces,' in their preëminently affective or intellectual or motor bearing. In other words, dynamic psychology will use the analytical data for what they are worth, and beware of *a priori* limitation of affective principles and exclusion of the 'intellectual' feelings in psychopathology after they prove so satisfactory in broad and liberal use in the analysis of child-life. Rather take the broadest list of kinds of affective type (such as Baldwin's) than an artificially narrowed one. The affective trend of paranoia is worth much more study than the adverse discriminations by Bleuler would admit. The chief cause of the artificial self-restriction would seem to lie with *a priori* views of what should be admitted as affect, and with *a priori* views of what should be admitted as paranoia. Neither for the one problem nor for the other the necessary work is *done*. The emphasis on positive and negative affects, to the exclusion of qualitative types, is natural enough in psychophysics and in the study of the physiological accompaniments, which do indeed point to a mere + and - of the blood-wave, and not in favor of Wundt's triple system. But there is no end of possibilities of well-founded qualitative differentiations, and Bleuler's own remark about the affective *types* — that unfortunately they are not studied yet — should have precluded an emphatic and final judgment and exclusion of the 'intellectual' feelings as affective agencies. And the assumption that Kraepelin's paranoia is more than a practical group, and that it should be considered

alone in the attempt to determine the final explicability of paranoic developments, is another unfortunate effect of definition at the wrong end.

Berze, whose booklet on paranoia was reviewed in the *BULLETIN* (Vol. I., 1904, pp. 269-271), discusses Bleuler's study very interestingly and naturally from the point of view of an apperception-disorder.¹

He shows how Bleuler observes in the beginning nothing but errors such as occur also in the normal, and that merely the *fixation* of the error stamps the attitude as a delusion, without being explained better than by a 'constitutional disposition' and 'predisposing factors,' possibly of the type emphasized by Freud. In the inquiry into the factor which determines the fixation, Berze's attitude has a certain advantage. His emphasis on an apperception-disorder ('mit dem Gefühl der Erleidens') is hardly prejudicial, because it is more apt to figure as a mere formula which gives the inquiry into driving factors of the situation or idées-forces a free field, and even urges it, as soon as an interest in 'driving factors' arises at all. And since nobody doubts the importance of affectivity in apperception, Berze's formula will not become an *a priori* barrier against investigating the nature and weight of the affective trend in cases of paranoia. Bleuler states at the very outset (p. 5) that the concept 'Gefühl-Gemüt-Emotion-Affect' deals with an abstraction, and that each process has also an intellectual and a voluntary side, and that it is merely a matter of convenience if we speak of [largely] intellectual, [largely] affective, and [largely] voluntary psychic events. If he thinks that *theoretically* the three sides must be kept apart, I say: Yes, if it really leads to positive advantages. Theory is perspective. Do we really get a better perspective in limiting affectivity ('the affects proper + the slight feelings or feeling-tones of pleasure and pain in all possible experience,' p. 6) so as to exclude the undeniable affective side of the intellectual feelings — merely because we can express the situation sufficiently well in terms of intellectualism? Is there really any consideration which would force the perspective on us in the face of actual disadvantages. I am not aware of any. The only tangible one is quite relative: The plain emotional disorders are more diffuse (not completely so; many a case of simple depression can talk indifferently about many topics), while the ones with a stronger intellectual component tend to be more circumscribed (but by no means wholly, as is shown by the *vague* uneasiness and the fundamental switching-off of the chief vital instincts of conduct of life).

¹ Joseph Berze (Wien), 'Das Primärsymptom der Paranoia,' *Cbl. f. Nervenheilk. u. Psych.*, June 1, 1906.

According to Bumke the term *Zwangsvorstellung* was introduced into German literature by v. Krafft-Ebing, 1867, in connection with the fact that in depressions the stream of ideation becomes painfully limited to what harmonizes with the depression. This constraint in ideation, volition and action exists even where there is no actual confusion of thought and is sometimes felt keenly by the patient.

Griesinger next used the word for conditions in which, contrary to the best intention and conviction of the patient, thoughts recur in the form of questions or otherwise, wholly beyond the control of and against the better knowledge and realization of the senselessness by the patient. This type was fully discussed in a masterly paper by Westphal (1878), who made the following definition: "Imperative concepts are those which, with otherwise intact intelligence and without being determined by an emotional or affective state, assume prominence against the will of the patient, cannot be thrown off, impede and cross the normal course of ideation, and are always recognized as abnormal and strange by the patient who realizes them with his healthy consciousness."

This definition and the cases on which it is based point plainly to the identity of the phenomena with what the French have very properly grouped together under the term *obsessions*. But while Westphal insisted on the negation of their dependence on emotional or affective conditions, probably in order to offset Krafft-Ebing's limited application of the term to the self-evident dominating influence of *depressions* on the stream of mental activity, the French never lost sight of the emotional foundation of obsessions insisted upon by Morel, although they distinguish phobias, that is, obsessions consisting of fears, and the ideational obsessions in which the anxiety and uneasiness manifests itself with an idea. In either case the process is felt as involuntary, automatic, and irresistible.

These French studies were unfortunately ignored by the earlier German writers, and, owing to Westphal's characteristic tendency to separate emotional and intellectual disorders and the provocation furnished by Krafft-Ebing's application of the word, there developed a tendency to make a clean-cut division of all the cases that showed uncontrollable ideas with the subjective feeling of obsession, with absence of an emotional or affective state, and recognized as morbid. More extensive clinical experience naturally brought forth the question whether it was admissible to speak of imperative sensations, imperative hallucinations, and imperative acts; imperative affects or moods being excluded at the very outset. Since sensations never give the

feeling of freedom or option, they would seem to be something by themselves. In the same way affects are not under voluntary control so as to allow a contrast of voluntary and involuntary forms, but ideas and possibly actions, when they arise directly from imperative ideas, can figure as obsessions. In this compact the phobias are put apart unless their nucleus is an idea (such as the idea of dirt in mysophobia, whereas agoraphobia, the fear of open spaces, is not included because the primary feature is an anxiety).

We find here largely on grounds of psychological or logical reasoning a disruption of what clearly belongs together as shown by their appearance on the same etiological foundation, and the frequent transition-types. Practically it is of course of some importance to distinguish whether the obsessions depend on or are accompanied by marked states of anxiety and uneasiness. But to make of the differences a fundamental issue and to cultivate the inquiry habitual to a certain type of German psychiatry, whether in any given case the emotional disturbance is primary or secondary, and whether therefore we have an emotional or an intellectual disease, is bowing to a mere system of thought, and belittling the rules of empiricism.

The Anglo-Saxon literature has steered remarkably free of such dogmatic outgrowths. When associationism became very pronounced it was neutralized by an instinctive indifference by the physicians working with the conditions in question. The whole discussion of Bumke gives one the idea that over the quibbling and the desire to live up to psychological definitions he becomes wholly incapable of a broad grasp on the recent discussions of this topic by Janet, Friedmann, Loewenfeld and others.

Bumke's review shows very clearly the advantages and disadvantages of pushing systematic considerations, with special attention to the system and definition and laws. These highly systematic conceptions may give a feeling of perfection and superiority over empiricism. But here, as in the paranoia problem, they lead their devotees away from the affection for the plain facts, the cases become degraded to imperfect illustrations, and that which should above all things be the starting point of new trends, *a new response to concrete events*, is surrendered for a plan of doubtful fertility. We may be able to learn a great deal from an analysis of our thought and deductions about things, but as soon as such analysis distracts from what I just called the instinctive affection for the concrete events, we cannot help but suspect an estrangement from the best roads of natural science.

If we obey our soundest instincts, we study events far less for their

absolute nature than in order to learn the conditions under which they arise and under which they can be modified. Apart from this, there may be a justified craving for systematic knowledge, but that should be considered as something of a private hobby, or possibly a yielding to scholastic traditions owing to its didactic advantages. It should be judged by its fruitfulness in the creation of heuristic hypotheses and only secondarily by the pleasure and satisfaction it gives to the author and to lovers of word-architecture.

In the *Archiv f. Psychiatrie*, Vol. VIII., on p. 748, Westphal reviews the phenomena of obsessions in the normal (naturally, for him, with the excluding of the states depending on emotions or affects), and with a suggestion of a desire for more facts in an as yet poorly explored field, he refers to a pastor who had an anticipation of dizziness, a suspension of thought in any room above ground, with an unpleasant feeling in his body. He remarks that such a case cannot be denied a somewhat different position from the other 'Zwangsvorstellungen,' and the end of his paper suggests that, had he not been committed to his idea of primary and secondary emotions and affects as a fundamental principle in psychiatry, and had he had a wider experience with obsessions, he would have been forced to accept a broader view than Bumke wants to limit himself to, thirty years *after* Westphal.

In all these systematic attempts we meet a very fundamental issue with regard to the shaping of psychopathological methods. Definitions and law-making instincts are a problematic aid in this field, and apt to do as much harm as good. When they attend to the *accessible* issues, the determination and differentiation of concrete components of events, and leave the grouping of the necessarily complex events subject to practical differentiation, they have a healthy rôle; but how can we expect to make useful definitions of that which naturally ramifies and is divergent owing to the introduction of factors which cannot be included in definitions, and where every special instance demands a specific inquiry? Scholasticism has produced a hypertrophy in the faith in definitions, and an irradiation of their application to domains in which they have merely verbal value and become an obstacle to sound empiricism. Definitions of words are always welcome; but they should not claim to be definitions of facts unless they can be proved to deserve it. Psychopathology is full of such blunders. Definitions of insanity and of various forms of insanity are almost all in this boat; they usually stultify inquiry because they clip the individual case of many of its facts, and overstate what little is known of

some rule-of-thumb deduction. The desire for definitions in domains which *must* be left to empirical rules is a caricature of the sense of accuracy, very much as labor in statistics when the number of cases is thought to make up for inaccuracy in the majority of single cases.

Psychopathology needs perspectives rather than definitions, lines of inquiry rather than *a priori* clipping of the object of investigation, and a veritable feeling of sanctity of the individual case in all its manifestations. To group what has proved sensible and helpful in the sizing-up of a hundred kindred cases, a process of natural summation of experience, is quite a different method from doctrinal splitting of emotion and intellect, and from starting with a definition, be it that of Kraepelin or Westphal.

PSYCHOLOGICAL LITERATURE.

APPLICATION OF ASSOCIATION STUDIES.

Ueber das Verhalten der Reactionszeit beim Assoziationsexperimente. C. G. JUNG. Leipzig, Barth, 1905; and Journal f. Psych. & Neur., 1905, Vol. VI.

Ueber die Bedeutung des Associationsexperimentes für die Psychopathologie. C. G. JUNG. Gross Archiv für Kriminalanthropologie und Kriminalistik, 1906.

Zur psychologischen Tatbestandsdiagnostik. C. G. JUNG. Centralbl. f. Nervenheilkunde und Psychiatrie, 1905, p. 813.

Die psychologische Diagnose des Tatbestandes. C. G. JUNG. Juristisch-psychiatrische Grenzfragen, Vierter Band, Heft 2.

In the review of the studies on Associations by the Zürich School in the PSYCHOLOGICAL BULLETIN, July, 1905, a preliminary hint was given concerning an issue which promised to go beyond mere description and descriptive analyses into the field of causal relations. Associations are by no means accidental. However varied the possibilities, the actual choice is determined and allows us to draw inferences concerning the general direction to which the person is adjusted. Association studies have so far been carried on with a great deal of attention to sound and grammatical and logical connection. Jung is using them now with especial attention to their relation to prevailing motives, or determinants of the stream of mentation. With a mere stop-watch indicating fifths of a second, it is possible to make out differences in the association time. A lengthening is noticeable especially where the test-word in some way touches emotional trends or 'complexes' of the person, whether these be conscious or more or less suppressed or 'displaced,' as in the case of hysteria, where an apparently irrelevant reaction takes the place of the disturber of the peace, usually some emotional remembrance or more or less subconscious relation. Instances of such displacements were given in the review of Riklin's case of hysteria in the quoted number of the PSYCHOLOGICAL BULLETIN.

We begin with the contents of the first paper: A reaction-time which exceeds the probable average of a person and is not explained by some variations to be mentioned, points, according to Mayer and Orth (*Z. f. Psychologie*, Vol. XXVI.), to an interference by an affective content or voluntary reaction. It is especially prolonged where the

affect is unpleasant. As was mentioned above, groups of such delayed reactions point directly to definite complexes. Jung gives the complete records of the experiments with several persons. The probable average reaction was, *e. g.*, 1 second. The reactions of more than 1.22 seconds with but few exceptions either belonged to a sensitive complex, or followed directly such a reaction. On going over the delayed reactions it is necessary to get the introspective help of the subject, and to report the experiment with a running commentary. The average association time is found to be 1.8 seconds, 1.6 in man and 2.9 in women, in the educated less (1.5) than in the uneducated (2.0). Some of the deviations are evidently normal and due to the kind of test-word. Concrete nouns call for the shortest reaction-times (1.67), abstracts and verbs for longer ones (1.95 and 1.90 seconds) — except with educated men, in whom the concrete nouns were usually followed by the longest reaction-time. The quality of the response, too, is of influence; abstracts take most time (1.98), adjectives and verbs least (1.65 and 1.66 seconds), and concrete nouns 1.81 (except again in educated men). Inner associations take a relatively longer time than the external ones (see PSYCH. BULL., 1905, p. 243, etc.). Sound reactions are abnormally long, since they depend on a certain distraction (*ibid.*, p. 247). Certain test-words have a delayed reaction even in the normal average, on account of their affective relations (83 per cent.) or their difficulty or rarity (17 per cent.). Other delays, however, depend plainly on conscious or subconscious affective relations or complexes, or under-currents. Such a delay is apt to show even in the subsequent reaction through perseveration of the affective response, either in the form of delay, or as an association which still belongs to the complex, or by abnormality in the form of a *lapsus linguae* or repetition of the test-word, or superficiality (sound-reaction). Other signs of an (usually unpleasant) *under-current* are: Odd reactions, mistakes, perseveration, stereotyped repetition of a reaction-word, translation into a foreign language, slang, quotations, *lapsus linguae*, assimilation or misunderstanding of the test-word. Finally, Jung has found, on going over the tests a second time, that the reactions affected by under-currents are also poorly repeated.

Lack of space prevents the review of the actual experiments and illustrations of the types of under-currents, which are very striking but are not all reproduced on account of their personal nature. The results bring home very forcibly the multiplicity of trends of preoccupation and the superficiality of that which keeps on the surface. The conventionality and censureship of what one chooses to express affects

the assumed and open stream of thought to such an extent that the data of mental causation or influence of one part of mental activity on the rest of the stream are often completely hidden.

The next step was to use these tests directly for the determination and discovery of morbid under-currents or psycho-analysis, or of concealed facts, as in the determinations of facts in criminology. For this purpose the list of test words is more or less loaded with words pointing to trends of suspicions. Jung furnishes an excellent instance in the case of a young man whose uncle and guardian suspected a number of petty thefts and wanted Jung to elicit a statement under hypnotic suggestion, in order to avoid further search by the police, and because the youth had previously wanted to consult Jung for some trivial nervous trouble. Jung declined for obvious reasons, but with the help of the data furnished by the uncle, he introduced thirty-seven catch words in the usual list of test-words, and he proceeded to subject the young man to the association experiment. The money was concealed in a drawer beside shirts and ties under a small board. The drawer was in a dresser, locked and possibly opened with a master-key. The young man had bought a watch lately and made several presents to his sister, etc.

The full report of the results is very interesting and shows how subtle the test is and how easily an over-critical mind would decline to see any deeper meaning in the reactions. In order to explain the method, I introduce here a small series of the results:

<i>Test.</i>	<i>Response.</i>	<i>Seconds.</i>	<i>Revision.</i>
1. Head.	Nose.	2.0	+ (correct).
2. Green.	Blue.	1.2	+
3. Water.	Air.	1.6	blue (incorrect repetition).
4. To prick.	Hurt.	2.0	+
5. Murder.	Manslaughter.	1.4	+
6. Long.	Short.	1.8	+
7. Five.	Six.	1.4	+
8. To present.	Lib-liberal.	2.0	to give.
9. Wool.	Cloth.	1.4	+
10. Watch.	Mechanism.	2.2	+
11. Table.	Foot.	1.8	wood.
12. To give.	To steal.	2.6	+
13. Chair.	Leg.	2.0	+
14. Obstinate.	Put out.	2.8	+
15. Drawer.	Would.	1.6	+
16. Sister.	Brother.	1.8	+
17. Lake.	Water.	1.4	+
18. Sick.	Good.	2.0	— (not remembered).

19. Burglary.	Theft.	1.8	+
20. To cook.	—	—	—
21. Ink.	Paper.	2.6	+
22. Bad.	Good.	2.0	
23. Portfolio.	Paper.	2.0	+
24. To swim.	Well, I don't know.	2.0	free — do well.
25. Sin.	Shame.	1.8	+
26. Blue.	Black.	1.4	+
32. To steal.	To take.	2.4	+
33. Board.	Wood.	2.8	+
34. Yellow.	Black.	2.2	+
35. Mountain.	High.	1.8	+
36. To search.	To find.	1.6	+
37. Salt.	—	—	+
38. New.	Old.	2.0	+

The words 8, 10, 12, 15, 16, 19, 23, 25, 32, 36 were introduced as part of the uncle's story. 8 shows a slight staggering in the reply; 10 and 12 and 32 a lengthening of the reaction-time; 13 and 14 are prolonged reactions following a 'critical' reaction, and also 33 and 34; 20 and 37 failures of reaction after a critical reaction; 24 a partial post-critical failure, shown also in the difficulty of reproductions. From the subsequent reactions I only pick out:

<i>Test.</i>	<i>Response.</i>	<i>Seconds.</i>	<i>Revision.</i>
47. Thief.	Burglar.	4.6	criminal code.
48. To find.	To steal.	2.6	search.
49. Books.	—	—	—
63. To catch.	To miss.	2.4	grasp.
64. To quarrel.	To love.	3.4	—
65. Police.	Thief.	3.6	+
79. To arrest.	Thief.	3.4	+
84. Jail.	Prison.	4.2	+

Jung felt convinced that the results pointed positively towards concealment of theft. He made direct charges against the young man and obtained an immediate confession. The question naturally arose how the same string of words would be reacted to by an absolutely unbiased normal person, and by one who merely was told of the facts hinted at in the special association list, but had not the concrete action on his conscience.

The control tests furnished many prolonged reactions, with the very words used for the culprit; thus:

to catch — thief — 3.0 +
 police — crime — 3.8 —

with the unknowing subject; and it becomes obvious that in every test-

subject different complexes may be connected with these words. Jung deplors the inevitable fact of multiple meaning and relations of the test-words, and considers one hundred words decidedly too few in practice. In a comparative table of the indifferent, critical and post-critical reaction times he shows that the arithmetical means of indifferent reactions in the guilty, the knowing and the naïve were 1.9, 1.0 and 1.9 seconds; the average time of the critical reactions, 2.8, 1.5 and 2.5, and the average time in post-critical reactions, 3.8, 1.4, and 1.8—hence a decided excess in the post-critical reaction-times in the guilty. The reproductions or repetitions of the critical and post-critical tests were defective in 90 per cent. with the guilty, 80 per cent. with the knowing, and 71 per cent. with the naïve.

Jung admits frankly that he bases his conviction above all things on his extensive experience with psychopathological data, and that the test of validity of the method in the control persons gave an unexpected number of delays, etc. It is obviously necessary to remember that some words have an affective value for almost everybody, even without special under-currents.

This same method is naturally of great importance and applicability in those pathological processes in which the physician must get at under-currents either dissimulated by the patient or actually beyond the reach of intentional introspection (as in hysteria). Even here we meet with the difficulty that the physician may be under the influence of an hypothesis which in turn is apt to call up suggestion for the expected results in the patient. This fact is no doubt the reason why the method is apt to be looked upon askance, but unjustly so, because in psychopathology we cannot expect to get along without methods involving a certain risk. We must have the courage of the wisdom of everyday life, which *realizes* the need of guarding against circumstantial influences but also the individual talent for subtle inferences, of which the dullard may be incapable, and in which the uncritical will create confusion, but in which after all nobody can afford to deny the success of the critical and trained observer and interpreter. Should we demand that a method of inquiry be such as to be applicable by anyone whatsoever, we should be guilty of carrying the dogma of human equality too far.

Far from wanting to create an esoteric system of psycho-analysis, the method mentioned will at least have to be limited to those capable of sufficient constructive imagination and at the same time sufficient critical restraint. The only generally convincing proof will have to be the practical test of the hypothesis, here as in all human experience.

Psychology has worked hard to get away from such methods involving personal skill. But with those who have the training in accuracy we must after all encourage the use of skilled judgment in the application of these methods, which in their very nature must be individualized and cannot be machine-made. The rehabilitation of such methods as truly scientific ones, will depend on the habit of test and counter-test, and its complexity is to be regarded as inevitable, but not as forbidding.

Some of us will have to admit frankly that our mind is less adapted to this type of work than Jung's. The same difference exists in the use of hypnosis and possibly other lines of activity. In these respects it would be foolish to be sensitive about admissions of personal differences, and as soon as we admit this, we can judge with much less prejudice on the merits of results offered. In the interpretation of an association experiment the psychology of the subject experimented with will in each instance have to be supplemented by the psychology of the experimenter; *i. e.*, we admit the complexity of the interpretation of the experiment, in addition to the complexity of the experiment itself. But, as I said, it will be wise not to consider the difficulty as *necessarily* forbidding.

The gain of the method will remain undisputed even if we find that occasionally a case proves sterile or another case too profusely overladen with complexes. It is so far the nearest approach of an experimental test to the combination of a qualitative and quantitative inquiry into the stream of mental activity and its most frequent disturbers.

INTERPRETATION OF OBSESSIONS.

Bruchstück einer Hysterie-Analyse. S. FREUD. Monatsschrift f. Psychiatrie u. Neurol., XVIII., 285-308, 408-466.

Drei Abhandlungen zur Sexualtheorie. S. FREUD. Leipzig und Wien, F. Deuticke, 1905.

The Pathogenesis of Some Impulsions. P. JANET. Journal of Abnormal Psychol., I., 1-17.

Recent Experiences in the Study and Treatment of Hysteria at the Massachusetts General Hospital, with Remarks on Freud's Method of Treatment by Psycho-Analysis. J. J. PUTNAM. Ibid., pp. 26-41.

Sigmund Freud finds the cause of the hysterical disorders in the intimate spheres of the psycho-sexual life and he sees in the hysterical

symptoms the expression of the most secret and 'displaced' or 'converted' desires or wishes. These facts naturally make the communication of the records of cases a rather difficult matter, partly because it is not fair to the patient to divulge the secrets, partly because the material is of the kind concerning which the great social compact of ethics has created an anomalous sensitiveness.

Freud communicates the record of one case in which he felt able to sufficiently dissimulate the identity of the persons involved to give the facts without offense. Foreseeing the criticism from those who object to relieving science of the laws of convention as to what shall be matters not to be spoken of, he quotes from Richard Schmidt a passage of regret over the fact that a scientific work should have to bow to an undignified censureship with excuses which might look like an acknowledgment of incriminations.

It is not my purpose to furnish an abstract of the history and details of the case. In type, the facts are equivalent with those in Riklin's case (*PSYCH. BULL.*, Vol., II., p. 253), and without a perusal of the complete material it is impossible to form a real idea of the complexity of the mental life of these victims of disposition and circumstances. The record contains two good instances of the use of dreams in the tracing of under-currents, and throughout many instances of that which makes so many doubt the justification of Freud's claims. The great tendency of the patient to furnish superficial sham explanations which would side-track anyone who had not the instinct of the prosecuting-attorney and the talent of constructive imagination, referred to in my review of Jung's work.

In a systematic presentation of his experience with the sexual life of patients, Freud has opened the eyes of the physician to an extension of human biology which differs very favorably from the sensational curiosity-shop of the literature on perversions, and is especially illuminating on account of the pedagogically important study of the infantile period. The book itself is so concise that a review would have to be a translation for which this *BULLETIN* is hardly the place. Freud's work is an absolutely essential though less documentary supplement to such presentations as Stanley Hall's in his work on Adolescence, and is to the psycho-pathologist as important as the study of dietetics to the general physician. Unfortunately the two topics have in common that there is as a rule more confidence in the rules that grandmother made than in any direct experience and experimentation.

In order to supplement Freud's psycho-analytical studies, the psychologist will do well to give well deserved consideration to two

studies which appeared in the first number of the *Journal of Abnormal Psychology*.

Janet, in his well-known charming presentation of his cases and of what he has to say about them, described first a case of dipsomania, a case of bulimia (a caricature of the therapeutic over-feeding), one of dromomania (a caricature of 'exercise'), one of impulsive epilation, and another of self-torture. In all these cases he demonstrates as the underlying factor the 'feeling of incompleteness,' a state of uneasiness which expressed itself in one by an intolerable feeling of total loss of interest and of the satisfaction of having emotion, of *déjà vu*, and of having a mere boiling mass of ideas in the head; in the second case, attacks of depression with weak spells and dread of fainting and empty sensation; in the third, a smothered feeling with confusion and fear of insanity; in the fourth a feeling of hopelessness and weakness, and in the last case a feeling of depersonalization (of acting like a mere machine, dominated by another force, etc.)—hence the infliction of pain to awaken herself. In each of the cases the impulsions figure as a means of relief, and the misfortune is that the subject is unable to conceive a variety of remedies for a condition which does not change. Therapeutically the point of attack is the depression or condition precipitating the crises of uneasiness, and the other issue is to help the patient to realize that a great many other methods of relief will do as well.

Dr. Putnam renders in a very lucid review the essentials of Freud's theories and methods. He contrasts with Freud's cathartic method that of the Bernese neurologist, Dubois, of Janet and the late Russell Sturgis, that of substituting sounder associations, and suggests with a number of examples that the situations which precipitated psychogenic troubles are frequently easily accessible in his New England patients, and therefore open to a 'substitutive' method, and he adduces some reasons why he considers even Freud's 'psycho-analytic' and cathartic method to be in principle substitutive. The 'uncompleted emotion' which by reason of its lack of completion was causing mischief as an under-current should not be looked upon as a permanent entity. Our memories and experiences are not possessions like books in our libraries; even in the subconscious realm we 'live ever a new day'; their importance lies in principle rather than in details, and the *principle* can be side-tracked without a rehearsal of the frequently revolting detail. The article deserves careful and repeated reading. In fairness to Freud it may, however, be said that while this method of substitution is the only one practicable in the hands and minds of

most of us, cases resisting it should not be deprived of the trial of Freud's catharsis by some one temperamentally and by training prepared to carry it out. Empiricism in the best hands will alone decide on Freud's contention, and it might be easy to obliterate much needed avenues of help by an early judgment. Temperamentally, I fully agree with Dr. Putnam; but I also see a welcome tendency towards experience with the concrete events in Freud's hypothesis, and on general principles I should encourage those who have the proper combination of tact and talent to continue on the difficult road of search.

THERAPEUTIC LETTERS.

Psychotherapeutische Briefe. H. OPPENHEIM. Berlin, S. Karger, 1906.

It is gratifying to see the common-sense activity of the physician drawn into the sphere of what is thought and communicated. The letters of Oppenheim to patients are very interesting and represent what a man of experience has to offer in the way of direction in practical philosophy of conduct and adjustment. The first letter is an explanation of the psychogenic nature of certain hypochondriacal anticipations and complaints and the practical consequences; the second one deals with the gradual education of a similar case to rational views; the third with a grave neurasthenia, etc. The whole is a series of heart-to-heart talks on mental and nervous hygiene covering the essential topics excellently.

SEXUAL PATHOLOGY.

Die Sexuelle Frage. AUGUST FOREL. 16th-25th thousand. Munich, Ernst Rheinhardt, 1906.

This volume, dedicated to the author's wife, is one of the most serious products of the growing feeling of responsibility of physicians towards the education of the race.

No topic is at once so delicate and so overwhelmingly important as the one here taken up by Forel. The various races will of course have their special ways of coping with the problem. But the psychologist who as a rule can be expected to have cosmopolitan interests will readily be willing to ignore boundary lines created by his racial traditions and see how one of the most serious-minded men attacks one of the most fundamental topics of psychology and sociology.

In his work on Adolescence, G. Stanley Hall has brought a mass of facts which cannot help but awaken a hunger for data in the later

phases of life, and in the present work the matter is put forth with an unusually frank and direct presentation and thoughtfulness of practical issues.

Forel begins with a general biological sketch, including the excrescences of the sexual instinct, the development of marital forms, etc.; he then reviews the sexual pathology, and discusses the rôle of suggestion in sexual life, the financial economic side of the sexual question, the influence of the environment, the relation of the problem to religion, to law, to medicine, to ethics, politics and economics, pedagogy and art, and finally a sketch of perspectives of the future. In an appendix Forel reviews some prominent works by other writers, such as August Bebel's 'Die Frau,' Ellen Key's 'Ueber Liebe und Ehe,' Guy de Maupassant's novels, Couvreur's 'La Graine,' etc.

Throughout, the book is a model of concreteness; and in the numerous dilemmas with which the practical psychologist and physician are confronted a long experience and sound instincts, not merely of reserve but of action, make Forel's work the source of much help and many suggestions.

Any one who wishes to get an idea of the sociological idealism pervading the work of the great champion of racial progress, will do well to read a pamphlet entitled 'Sexuelle Ethik,' published by Ernst Rheinhardt, Muenich, 1906. To this program Forel adds some instances of ethical sexual conflicts from life, illustrating the complex nature of the topic and the need of the expression of the experience of the best of our race, instead of mere confidence in conventionalism and fatalism.

RESTORATION OF FUNCTION.

Ueber den Wiederersatz der Funktion bei Erkrankungen des Gehirnes. G. ANTON. Berlin, S. Karger, 1906.

Anton has chosen for his opening lecture as successor of Wernicke, at Halle, a topic which is well worth a brief review. Clinical and experimental work has of late years attempted to analyze the important phenomena of substitution of function in lesions of the nervous system. Many lesions of the frontal and parietal lobe, cerebellar defects and one-sided destruction of the striatum may be devoid of any symptoms and are especially apt to be smoothed over in childhood. But even in a gentleman of seventy, Anton found numerous small foci of arteriosclerotic softening in the brain without any deterioration of his acute intellect and judgment and social adaptation and self-regulation. In view of the scantiness or practical absence of regenerative processes in

the central nervous system, the studies on substitution or adaptation of function by Ewald and Bickel have proved to be of great interest. The disorders of attitude and balance following destruction of one labyrinth in a dog is readily recovered from; even the profounder effects of destruction of the second labyrinth are corrected again, after a few months; removal of one motor area caused a crossed hemiplegia plus relapse of the typical disorders of coördination of the hemiplegic side, but even these were corrected again for running and jumping, even in the dark. Removal of the other motor area caused an irreparable loss not only of the double hemiplegic type with inability to do tricks, but a relapse of the labyrinth symptoms. What little restitution of coördination occurred was at the mercy of the use of the eyes and failed when they were closed. Passing over the well-known substitutions of cerebellar functions, we refer to Bickel's experiment: section of the posterior roots of both hind-legs, compensation of the ensuing spinal ataxia; then removal of both sensory-motor regions of the cortex, with complete relapse of the spinal ataxia for the hind-legs and appearance of simple cerebral ataxia in the forelegs. Many experimental and clinical data and the substitution of aphasic defects furnish excellent instances in a higher sphere, and the same undoubtedly holds for the highest functions. The new adjustments have, however, some residual marks: greater fatigability of the new mechanisms, defect under special demands, such as movements of the legs in suspension, during intoxication or narcosis, in special positions. The modus of restitution by neighboring cortex, by symmetrical cortex portions (as in aphasia?), and by the central and peripheral levels or intermediate levels (as in the subsidiary automatism of the infracortical centers in Goltz's decerebrated dog) opens interesting problems. The demonstration of vicarious hypertrophy easily demonstrable in the pyramid of young subjects with infantile hemiplegia and the possibility of changes in form and number of cells offer a new and interesting field of observation.

The modified nervous adjustment really marks a new brain-type. Physiologically and psychologically we meet even normally with excessive compensation, as when irritability covers up emotion; and even more plainly in the timidity of the nervous, the laughter of the depressed hysterical. The compensation of psychical defect due to brain-disease is especially worth studying, and Anton points to an interesting divorce of the mere finding of words and the finding of the meaning, which, with Leibnitz, he calls psittacism or parrot-language. A patient of his observation, in whom an abscess of the parietal lobe

had produced paraphasia and complete alexia, recovered slowly after operation, and learned to read again; but he only learned to recognize the words with the first effort and had to read several times before he grasped the sense. Many changes of character are similar phenomena of compensation.

The whole trend of thought is worth bearing in mind and might easily suggest valuable applications.

A. M.

REACTION-TIME IN INSANITY.

The Time of some Mental Processes in the Retardation and Excitement of Insanity. SHEPHERD IVORY FRANZ. Amer. J. of Psychol., 1906, XVII., 38-68.

The patients dealt with in these experiments were afflicted with what Kraepelin terms 'manic-depressive insanity.' Six subjects were used in the research, two normal, two depressed (retarded), and two exhilarated (excited). The following experiments were made:

A. The subjects were asked to tap with a pencil as many times as possible for thirty seconds. The results obtained from the excited subjects did not differ greatly at first from those of the normal subjects. The former, however, did not show much practice effect. The retarded patients were much slower, but they improved with practice.

B. The time of reaction to sound stimulus. The averages for the excited patients as compared with the normal shows a slight slowing up of reaction time.

C. Choice reaction time. The excited patients do not show increased rapidity, although they are supposed to have rapid association processes. On the whole, retardation does not necessarily seem to be a decrease in the speed with which a movement is instituted.

D. The average time of reading a word. As practice continued, the normal and the depressed subjects improved, but the excited patients did not.

E. The time taken to mark 100 e's among 850 letters. The excited patients are not as rapid as the normal subjects.

F. The time required to add 20 problems, each consisting of two five-digit figures, placed one above the other. In the order of rapidity the subjects stand at the end of the first week as follows: normal, excited, depressed. One of the excited cases had kept books and stood at the head of the list. Practice is most marked in the case of one of the depressed cases. He improved 60 per cent., while the improvement in the other subjects was not more than 25 per cent.

G. The time taken to discriminate and distribute 100 colored cards of 10 different colors showed no relation to mental state.

From these experiments the following conclusions are drawn :

The excited condition is not an increased motor ability, but merely an increased motor diffusion. Retarded patients may be improved by systematic exercise.

For the more complex mental processes the retarded subjects do not take proportionately as long a time as they do for simple acts. The excited patients tend to keep normal relations.

It is unlikely that retardation comes principally at the beginning of movement.

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BOOKS RECEIVED FROM JULY 5 TO AUGUST 5.

Harvard Psychological Studies. Edited by HUGO MÜNSTERBERG.

Vol. II. Boston and New York, Houghton, Mifflin and Company, 1906. Pp. 644.

Congress of Arts and Science. Vol. IV., Inorganic Sciences. Boston and New York, Houghton, Mifflin and Company, 1906. Pp. vii + x + 759.

G. B. Vico als Geschichtsphilosoph und Völkerpsycholog. OTTO KLEMM. Leipzig, Engelmann, 1906. Pp. xii + 235.

La Mélancolie. R. MASSELO. Paris, Alcan, 1906. Pp. 284.

Le Sourire. GEORGES DUMAS. Paris, Alcan, 1906. Pp. 167.

Essays. WILHELM WUNDT. 2te Auflage. Leipzig, Engelmann, 1906. Pp. iv + 440.

Les grands philosophes — Montaigne. FORTUNAT STROWSKI. Paris, Alcan, 1906. Pp. viii + 356.

La rêverie esthétique. PAUL SOURIAU. Paris, Alcan, 1906. Pp. 169.

Investigations of the Departments of Psychology and Education of the University of Colorado. Vol. III. No. 2. Boulder (Colo.), Published by the University, 1906. Pp. 25-67.

Thought and Things, or Genetic Logic. A Study of the Development and Meaning of Thought. J. MARK BALDWIN. Vol. I. *Functional Logic, or Genetic Theory of Knowledge.* London, Sonnenschein & Co.; New York, Macmillans, 1906. Pp. xiv + 273.

NOTES AND NEWS.

DR. NORMAN SMITH, of the University of Glasgow, has accepted a call to the Stuart professorship of psychology at Princeton University, left vacant by Professor Thilly's resignation.

DR. WARNER FITE, adjunct professor of philosophy in the University of Texas, has been appointed junior professor of philosophy in Indiana University.

Mr. D. J. Cowling, assistant in the psychological laboratory of Yale University, has been appointed assistant professor of philosophy in Baker University, Kansas.

THE following are taken from the press:

DR. C. S. MYERS, of St. Johns College, Cambridge, has been appointed professor of psychology at King's College, London.

PROFESSOR NOAH K. DAVIS, who is now seventy-six years of age, has retired from the active duties of the chair of moral philosophy in the University of Virginia.

THE
PSYCHOLOGICAL BULLETIN

THE TERM EGO AND THE TERM SELF.

BY DOCTOR PERCY HUGHES,

University of Minnesota.

The terms ego and self at present are used interchangeably. I contend that in the current use of these terms are to be found two meanings at once so distinct and so fundamental that it would be a great advantage to retain and limit to one of these meanings the term ego, and reserve to the other the term self. By self I would indicate always an idea present in the self-consciousness of any individual; by ego, the individual who is or can be self-conscious, who has or may have the sense of self and not-self.

The idea an individual has of himself is often expressed by the term self, rather than by the phrase, sense *of* self. Thus Angell (*Psychology*, p. 390) means by the moral self not the individual, but his 'conception of' himself, a part of the moral situation as it appears in his individual consciousness. In accounts of the development of self-consciousness, such as Baldwin's, the term self is used in this way.

The term self is also used to indicate the individual who is or may be self-conscious. Thus for Angell the self is 'a life phenomenon, with periods of growth and expansion, periods of maturity, and periods of decay and disintegration'; it is the organism, and it is also the memory; in brief it is the 'psychophysical organism' (cf. *op. cit.*, pp. 6, 383 and 396). For this use I would substitute the term ego.

Bradley (*Appearance and Reality*, 1893, p. 77) in one and the same passage uses self in both the ways I have described. He says the self is 'a mass of feelings, thoughts, sensations,' which *includes* 'self and not-self' and what is not distinguished as either, in short the total filling of the man's soul.' An apparent ambiguity is avoided if we say in this case, the *ego*, the individual, includes self and not-self, etc.

This distinction I urge as a matter of practical convenience. There is one set of problems concerned with the concept of the ego, the living unity of the individual capable of self-consciousness; there is another set dealing with the concept self, the essential element of self-consciousness. Among the former problems are those of the physiological conditions of consciousness, and of the changes in consciousness; also the general problems of education and the social sciences. Among the latter appear the more specific problems of self-consciousness, the moral questions of self-realization and responsibility; the description of the several 'self-feelings,' which still lack proper consideration; and the description of the religious consciousness.

It is in connection with ethical problems that the term 'self' has come into vogue. For instance, Baldwin, in his *Social and Ethical Interpretations*, commences by using the phrases 'sense of' and 'thought of' self to indicate the essential content of self-consciousness in its antithesis to the not-self. But the complexity of that 'sense of' self forces him to a simplification of terms. He says (p. 40) that the child's 'thought of self' 'is a *self* of habit or a *self* of accommodation.' And thenceforward we find that, in such expressions as 'habitual self,' 'accommodating self,' 'social self,' self now means not the individual thinking and thought *of*, but the *thought* the individual has of himself. In a future paper I shall show that 'self' in this restricted sense is even more complex, and the distinction between the several 'selves' of self-consciousness even greater than has yet been shown. The study of the self in the narrower sense as the essential content of self-consciousness has not yet received adequate attention; and this neglect I attribute in part to the lack of a distinct term. It is but natural, where two terms are used indifferently and carelessly for two distinct meanings, that the problems connected with each should be obscured by the obscurity of terminology.

The value of distinguishing the meanings by the two terms is fairly well exemplified in the case of the derivatives, egoistic and selfish. Egoistic actions, egoistic impulses or instincts are such as result primarily in the good of the agent. Selfish action, selfish impulses or instincts, such as pride, are those that are directed consciously toward the self. It has been contended that egoism and altruism are opposites; and also that they are not. If egoism is defined as above it is clear that egoism and altruism are different but not opposite. In that sense the opposite of egoism, non-egoism, has no particular moral significance. But if by egoism is meant selfishness, there is an opposite of moral significance, *viz.*, unselfishness. The

question and contention here arise chiefly because egoism is used in two senses, one of which I would call selfishness.

The philosopher is unselfish who, without thought of benefiting himself, does as a fact find joy in his system-building. If his system is worthless his conduct is egoistic, though none the less unselfish. The politician who seeks the pride of office is selfish. His methods of attaining his selfish end may, however, be in the highest degree altruistic, because they benefit others, even though they benefit himself more. Selfishness is to be commended in certain relations, doubtless, while egoism is approved in other relations. Unselfishness includes both the case where the object and motive is definitely the not-self in its antithesis to the self, and also the case where that antithesis does not occur, and the individual faces a problem in the attitude of disinterestedness or *aloofness*. The former only is self-sacrifice. Non egoism, on the other hand, includes mere altruism, where the action *results* in another's good without regard to whether the agent is benefited or not; and also that specific form of altruism where, in promoting the good of another, the agent effects his own ill.

The first to use the term 'self,' I believe, was Hume. For him it is a 'bundle or collection of different perceptions'; it is an object of experience in which a man recognizes himself. Again, he speaks of it as the object of such emotions as pride and self-love. It is clear that the use to which I would limit the term self accords with this its original use. On the other hand the term ego has commonly been used to denote the unity of the individual, whether or not that individual unity appeared and was recognized as self in the individual consciousness. Kant's transcendental ego is such a unity; and those who contend that there is always a *subject* of consciousness, which somehow 'avoids direct observation,' and never is an object of consciousness, have a similar conception. Such a subject I would call an ego; and *if the subject is also an object*, if it is the 'thinker' of James, or the 'psychophysical organism' of modern psychology, it still is the unity of the individual, and is subsumed under the term ego, as I would use it.

This paper is preliminary to one in which I shall point out the many senses in which the term 'self,' even in the narrower sense here described, is used. I shall show the confusion that occasionally arises from the neglect of these distinctions, and the advantages to be gained by observing them. Before presenting such a paper it was first necessary to remove the ambiguities that result from the use of self to indicate not merely the essential content of self-consciousness but also the individual capable of self-consciousness.

PSYCHOLOGICAL LITERATURE.

SYSTEMATIC TREATISES.

Elements of Psychology. EDWARD L. THORNDIKE. New York, A. G. Seiler, 1905. Pp. 351.

Of the elementary books on psychology which have appeared in recent years, this volume by Professor Thorndike seems, to the present reviewer, to be one of the most useful and interesting. Its arrangement and distribution of the subject matter; its adequate and lucid exposition and its well formulated definitions make it useful; while its wealth of examples drawn from common life makes it interesting. The book is divided into three parts: descriptive psychology, physiological psychology and dynamic psychology. In the first part the topics treated are: feelings of things present, sensations and percepts; feelings of things absent, images and memories; feelings of fact, relations, meanings and judgments; feelings of personal condition, emotions; feelings of willing; general characteristics of mental states; and the functions of mental states. The exposition of these topics is straightforward and clear. The author is able to say much, both in small compass and in transparent language. The doctrine is, for the most part, identical with that body of observation which is now generally recognized as constituting the essentials of descriptive psychology. The new classification of mental states (pp. 108-111) attracts one's attention. The principle of classification is the 'directness' in which feelings stand to their objects. According to this principle, feelings are divided into three classes: (1) feelings which are what they stand for, such as blue, sleepiness, suffocation, terror, rage and length; (2) feelings which are like what they stand for, such as "percepts and images (and the pseudo-emotions), which have objects more or less, but always somewhat, like themselves. The feeling of blue which we call the feeling of 'the sky,' the feeling of a white rectangle which we call a percept of a sheet of paper, the image of a line an inch long — each of these refers to something which it is not exactly but only in part" (p. 109); (3) feelings which are unlike what they stand for, such as feelings of intellectual relations, of meanings and judgments. The three classes are designated, respectively, feelings of the first, second and third intention. This classification reminds one of Locke's division of ideas, according to their

conformity or non-conformity to an archetype within the mind or out of it. Physiological psychology is treated in three main topics: the constituents of the nervous system; the action of the nervous system; and the nervous system and mental states. No description of the gross features of the nervous system is given. For, in the author's opinion, it 'offers little instruction to the student of mental life.' In this connection it may be said that while, undoubtedly, the finer structure of the nervous system, along with what is known of the physiology of nerve cells, is the best knowledge for the psychologist, on the other hand, without some first-hand acquaintance with the occurrence and distribution of cell-bodies and fibers, such knowledge is likely to lead to a false familiarity with the system as a whole. An admirable feature of the illustrations is that, for the most part, they are reproductions of actual microscopic preparations. The serviceableness of the neurone theory for psychological explanation is again evinced by this book. But already the retreat from that position has been sounded. What changes in physiological theory, and consequently in psychological theory, the fibrillar connection of nerve cells will make, remain at present undeterminable. The neurone theory works in so well with current psychology that it would be a pity to lose so useful an hypothesis. Dynamic psychology is defined as the science of the mind in action (p. 184). The importance, for the author, of this aspect of psychology, is shown by the fact that it receives more space than either of the other parts. Two main subjects are considered; instincts and capacities, and habits. The latter subject is divided into the connections set up between sense stimuli and mental states; connections set up between mental states; and connections set up between mental states and acts. In one case only does the view of the author run counter to orthodox opinion. As he points out in the preface, the author is unable to hold that the motives to action are only resident or remote sensations of the movement itself. The view advocated is that any mental state can serve as a motive.

Idées générales de Psychologie. G. H. LUQUET. (Bibliothèque de Philos. Contemp.) Paris, F. Alcan, 1906. Pp. 295.

The author has not attempted to write a text-book or manual of psychology, treating of the particular phenomena of mind; his purpose, rather, has been to give some account of those more general aspects of mental life which in more technical works are so often left unnoticed. While his attempt, in the main, has been reasonably successful, the chief defect of the book seems to be a lack of concreteness

and of illustration. The general aspects of mental life have been seized upon with sufficient sagacity; but their force and value for consciousness is not brought home by example and illustration. The first chapter, *The Spontaneous Consciousness*, points out the paradoxical nature of mental states: that they are at once both knower and known. That each state of consciousness belongs to the experience of a self; that each state is related to the future and to the past — in short, that consciousness is a stream — is the gist of the second chapter. One has only to compare James's chapter on the stream of thought with this (the second) of the author, to realize how much has been lost by omitting illustrative examples. Mental phenomena are divided into three classes: sensibility, action and intelligence. Each of these classes is further divided into three subdivisions, according as the facts are elaborated, spontaneous or elementary. Since intelligence does not conveniently fit into this schema, another has been provided. The phenomena of intelligence are dichotomized as empirical or extra-empirical facts. Memory, imagination, attention, association lie in the first class; reason is alone in the second class. The remainder of the book consists in tracing out, with the help of this classification, some of the more obvious characteristics of mental life; such as its solidarity, its continuity, its selectiveness and its practical efficiency.

H. C. STEVENS.

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Le sentiment et la pensée et leur principaux aspects physiologiques.

ANDRÉ GODFERNAUX. Deuxième édition, revue. Paris, Alcan, 1906. Pp. xii + 203.

The place and importance of affective and motor phenomena in mental life, the relations of these phenomena to one another and, in particular, the influence of feeling on thought, are presumably more fully recognized and better understood now than when twelve years ago Godfernaux first published the above essay dealing with these matters in a somewhat novel manner. The work received at the time adequate, if possibly somewhat too complimentary, notice in these pages from the competent hand of Professor James, whose article the author refers to in the preface to the present edition as one of great interest. As this second edition brings nothing new to the argument, the revision extending only to unimportant details, the reader may be referred for an account and critical estimate of the work to the original notice (*PSYCHOLOGICAL REVIEW*, 1894, I., pp. 624-627). It is greatly to be regretted that the author has not followed James's suggestion to

improve in a second edition the exposition of his doctrine of motor synthesis, which is his final interpretation of mental synthesis (p. 154). This doctrine still remains obscure in the extreme. And the same is true of the doctrine of feeling (*sentiment*) as vague, diffuse consciousness corresponding to vague, diffuse movement, of thought as delimited consciousness corresponding to localized, systematized movement, and of emotion as a concrete and definite form of feeling corresponding to motor tendencies. It is not that these doctrines are false, but they are altogether too abstract and ill-defined. With all recognition of the author's learning and ability one cannot but feel that one is dealing here with a programme rather than with a thought-out conception. One feels the lack of a clearly defined point of view, such as the biological point of view adopted by Angell and other American psychologists, in the light of which the motor and affective phenomena here so much insisted on obtain a real significance. In the absence of some such controlling conception the rôle assigned to movement and feeling seems exaggerated. There appears to be no good reason why the affective life and the movements underlying it should be regarded as more primary and fundamental than any of the other now differentiated aspects of mind. It is the author's view, indeed, that this primacy holds only for the individual, while in the race thought is primary and only gradually becomes transformed into feeling (p. 200). If anything, the reverse would seem to be true. But the point cannot well be considered apart from a general genetic theory, which is here wanting, and in the light of more exactly defined psychological conceptions.

H. N. GARDINER.

SMITH COLLEGE.

THE SELF.

The Psychological Self and the Actual Personality. J. A. LEIGHTON. *Philos. Rev.*, 1905, XIV., 668-683.

The first section of this article may be taken as a criticism of an exclusively psychological analysis of experience. The structural psychologist, anxious to win a place for himself among the scientists, is in serious danger of becoming a mere physiologist. In his worship of the scientific ideal exactitude he has lost his hold upon the self of concrete experience. He destroys the living dynamic quality of selfhood in the act of analyzing it. The result of his attempt to reduce the unity of consciousness to its simplest terms is the discovery of a number of elements, artifacts which are then combined by artificial

laws, and the final outcome is a psychologically created self completely out of touch with reality. Since it is an essential characteristic of consciousness to flow and change as well as to exist, the actual self is ever beyond the reach of the structural psychologist. The result of retrospective observation is an objectified materialized self, having space and time relations. The true self of immediate action and feeling can never be given as an object, is immaterial, transcends space and time. The recognition of this fact accounts for the rise of a functional psychology which attempts to do justice to this active principle of selfhood. It emphasizes the conative aspect of consciousness, and conceives of the self as an end-positing, end-attaining activity. The functional point of view is to be criticized, however, for dealing too exclusively with biological categories. It fails to give us the reality of the actual self in not allowing sufficiently for the mental and spiritual character of man's environment.

If psychology is to be of practical use to education, law, criminology and the normative sciences it must regain its connection with the self of everyday life. It may do this, the author believes, by substituting for its present method one which may be called the 'meta-historical' or 'noölogical.' The conditions for the evolution of selfhood are preëminently social, historical and cultural. The actual self is to be found then in a study of the historical systems of thought, of the culture systems of mankind. These systems are to be found embodied in codes of morality, manners and politics, in current scientific opinion, in labor regulations, in religious doctrines. Under the influence of these institutions representing the spiritual development of man, the individual comes to a consciousness of self. Indeed, his attainment of selfhood is dependent upon his conscious reaction to or rather into this social material, transforming and re-creating it. That which the greatest makers of the spiritual history of man—Christ, Luther, Raphael, Galileo—have done, each individual does on a small scale. So civilization comes to be the record of man's shifting emphasis upon the values of the various partial culture systems, æsthetic, ethical and intellectual. It is the result of a continuous process of rejection and assimilation of social standards by the individual mind. Within this evolutionary process the actual self is found as its nodal point or creative center. Hence a psychological analysis of the self has value only when it is continually supplemented by an historical and a sociological investigation of the whole culture process of society.

GRACE BRUCE.

VASSAR COLLEGE.

SENSATION AND PERCEPTION.

Normale und anormale Farbensysteme. A. KIRSCHMANN. Archiv f. d. ges. Psychol., 1906, VI., 397-424.

In this article the author is concerned chiefly with the schematization, by means of Wundt's double color pyramid, of the manifold of light and color for the normal eye, and for various types of abnormal eyes. Physical and physiological conditions are excluded, and the various visual qualities and intensities are exhaustively considered, and located in the spatial representation. For those interested in the analogical description of visual sensation the article is exceedingly valuable on account of its comprehensiveness and acuteness.

In the incidental discussion of fact and theory relevant to the main purpose there are several points of interest to the general student of color psychology. The first is the author's assumption that color systems must be monochromatic, dichromatic, or inclusive of an infinite number of qualities. This is based on the analogy of point, line, and plane in the geometrical representation, and is finally developed into an argument against the theory of a definite number of fundamental colors. Another important assumption is that the component theories demand that the neutral band in the case of a color-blind patient should fall in a definite place in the spectrum, determined by the 'class' in which the patient is placed. It is also implied, though perhaps not intended, that the component theories fail to provide for neutral bands in the purple of the converse spectrum. Adherents of the three-color theory would doubtless be interested in further explanation on both of these points. The author holds that the identification of the color actually seen in peripheral vision is very uncertain and misleading because of the impossibility of direct comparison, and cites obvious errors in other types of introspection to show the possibility of mistakes of serious character. One new case of abnormal color vision is reported. The patient reports that he sees only yellow and blue, and insists that the yellow is a 'cold' and the blue a 'warm' color.

The author promises a second article in which he will deal with cases of color-blindness offering special difficulties.

KNIGHT DUNLAP.

UNIVERSITY OF CALIFORNIA.

Differenztöne und Konsonanz. C. STUMPF. Zeitsch. für Psychol. u. Physiol. d. Sinn., 1905, XXXIX., 269-283.

In this article Stumpf subjects F. Krueger's theory of dissonance to a searching criticism. Krueger has stated (*Phil. Studien*, vols.

16 and 17, *Archiv f. d. ges. Psych.*, vols. 1 and 2) that two simultaneous tones give rise to five difference-tones, two or more of which may fall together. The rates of these difference-tones may be found mathematically by continuously subtracting the smallest from the next largest vibration rate. Thus if the primary tones have the ratio 7 : 12, the difference-tones will be represented by 5, 2, 3, 1, 1. If any two of these difference-tones fall closely enough together they produce beats, and a rough, vague, disagreeable intermediate-tone is heard.

According to Krueger it is to these beating difference-tones and the resulting intermediate-tone that dissonance is due. In a consonance there are no beats of the difference-tones, and therefore no intermediate-tone: Two or more of the difference-tones fall together, thereby giving greater unity and simplicity to the clang, and thus the consonance approximates more nearly a single tone. Every dissonance is apprehended as a discordant consonance, *i. e.*, a slight deviation from a simple mathematical ratio, and contains as its lowest portion a discordant prime, in other words, beats, and a resulting intermediate-tone.

Stumpf in attacking this theory of dissonance accepts provisionally Krueger's statements as to the five difference-tones and the intermediate-tone resulting from their beating, and proceeds to show that according to this criterion a number of well recognized musical dissonances would have to be called consonances. For example, primary tones with the ratios 8 : 11, 7 : 10, 5 : 7, etc., if multiplied by 100 are still decidedly dissonant, and yet their difference-tones lie too far apart to give beats. If it be said in answer to this that difference-tones beat when much less close together than primary tones have to be, Stumpf points out that recognized consonances, such as the major third, the major sixth, and even the fourth, will be turned into dissonances, and we shall have no consonances left but the octave and the fifth. Moreover, in none of the dissonances mentioned by Stumpf do we find a discordant prime in the lowest portion of the clang as the theory demands, but rather such ratios as 1 : 2, 1 : 3, 3 : 5, 2 : 5, etc.

As a further objection to the theory, Stumpf calls attention to the fact that if two dissonant forks are sounded and held one to either ear the beats and difference-tones become quite imperceptible, while the dissonance remains undiminished. The fundamental error of Krueger's whole theory of dissonance, according to Stumpf, is that it is based upon imperfect or discordant consonance, that is, upon very slight deviations from the simplest ratios. It is true that difference-tones do enter into such discordant consonances, as was pointed out by

Helmholtz. Krueger has chosen all his examples from these discordant consonances and has neglected the large range of musical dissonances indicated by Stumpf. It will be interesting to see whether Krueger can meet Stumpf's objections in the further development of his theory.

J. C. BELL.

WELLESLEY COLLEGE.

Beitrag zur Frage der Parosmie. H. BEYER. Ztsch. f. Psych. und Phys. d. Sinnesorgane, XXXV., 50-61.

Nasales Schnecken. H. BEYER. *Ibid.*, 260-267.

In the first of these two papers Dr. Beyer describes two cases of parosmia and of partial anosmia, and discusses both in relation to Zwaardemaker's theory of specific smell-energies and of smell localization. The clinical facts enumerated seem to fit but roughly into the details of this theory. On the other hand, they certainly buttress the general doctrine that there are certain specific energies of smell. They also support Zwaardemaker's supposition that when an area on the olfactory membrane is subjected to maximal stimulation other areas lose in sensibility in proportion to their distance from the area of maximal stimulation.

In the second of the two papers the writer opposes Zwaardemaker's conjecture that the impressions of sweet and of bitter which are obtained by inhaling the fumes of chloroform and of ether respectively may be mediated by epithelial taste-buds found in the olfactory membrane of the nose. Against this supposition Dr. Beyer brings evidence to show that when, on the one hand, these fumes are introduced into the nostril they are not tasted unless the choana is open, and that when, on the other hand, the fumes are introduced into the pharynx, the tastes are localized in the nose if the choanæ are free. Finally, Dr. Beyer notes that the epithelial buds which have been found in the olfactory region in man may be simply intra-epithelial glands.

E. A. McC. GAMBLE.

WELLESLEY COLLEGE.

Die Normaltäuschungen in der Lagewahrnehmungen. C. SPEARMAN. Wundt's Psychologische Studien, 1905, I., 388-493.

A summary, both historical and critical, of the previous studies on cutaneous localization introduces the present report. Many experimenters have failed accurately to distinguish *Raum-*, *Orts-* and *Lagewahrnehmungen*. The first of these refers to tests for the threshold of separateness for two tactual stimuli; the second to localization tests

where the observer tries to touch again the stimulated spot; and the third to tests where the whole region is hidden from view and only the single stimulus is applied. The author considers only the *Lagewahrnehmungen*.

In the method most generally employed the arm was hidden by a finely meshed screen stretched horizontally a little distance above it. Through this screen the stimulus point was pushed and the blindfolded observer touched the screen with a dull pointer over the spot where he located the touch sensation. The error was determined by counting the meshes of the screen, there being seven to the centimeter. This apparatus was modified and complicated as required.

Much stress is placed upon articular and segmental illusions. The difference between these two is best indicated physiologically. The articular illusions arise in connection with the activity of end organs found principally in the joints, as Pacinian corpuscles; the segmental illusions with the activity of organs situated in the skin. In both illusions a constant factor, relating to the direction of the error, and a variable factor, relating to the delicacy of localization, appear. Measurements of illusion were made under varying conditions, as localization on different parts of the body, effect of movement, strain, pain, mode of observing, attention, blindness. Visual localization is compared with tactual.

The results obtained are not unusually interesting and, it would seem, are scarcely in keeping with the pretentiousness of the article itself.

MABEL CLARE WILLIAMS.

UNIVERSITY OF IOWA.

MEMORY, ASSOCIATION, ATTENTION.

Experimentelle Beiträge zur Lehre vom Gedächtnis. ADOLF POHLMANN. Berlin, Gerdes und Hödel, 1906. Pp. 191.

This monograph presents the results of a study which is for the most part a more careful and extensive re-investigation of some memory problems that were already familiar. Besides verifying the results of previous investigators on a number of points, the author adds much to the analysis of the relation of the various conditions upon which the amount that can be recalled depends.

His presentation falls into three parts. The first considers general matters of method. The second gives his results on the influence of localization on the amount that can be recalled, meaning by localization the association of a term with its position in the group of stim-

uli as presented. The third presents the results on the influence of the method of presentation of the material, whether it is auditory, visual, motor or different combinations of these.

His procedure was essentially that of the memory span method. The percentage of the number of terms of a group of stimuli correctly recalled was taken as a measure of the memory permanency. He lays some stress on the advantages of this way of measuring memory over others that have been used. His subjects were school children, ages 9-14 years, and a small number of seminar students. The results of the first tests are arranged according to the material used (nonsense syllables, two-place numerals, consonants, and nouns), age, general school grade, and sex. They offer little that is new to memory studies.

To determine the effect of the association of the term with its position in the group five different series of tests were given. In each series a comparison was made between the amounts that could be recalled for two ways in which the group of stimuli was presented. In one the conditions were made favorable for associating each term of a group with its position in the group, and in other ways. In the other the conditions for such associations were made unfavorable. In every instance of his general averages considerably more is recalled under the former conditions of presentation. Introspective evidence corroborates the objective results of the tables. The favorable effect of subgrouping the group of stimuli is greater in the visual presentation than in the auditory. Further, for subjects of a non-visual ideational type the effect of subgrouping largely disappears. The general indication is thus that the association of a term with its position in the group occurs in visual terms. He notes a general tendency in auditory presentation to arrange the terms of a group in a visual spatial order.

The relation of the amount recalled to the method of presenting the material was tested with different kinds of material. In the different series the presentation was (1) visual, (2) auditory, (3) simultaneously visual and auditory, (4) simultaneously visual and vocal, the subjects naming the terms aloud as they were presented visually. The differences in the amounts recalled for the auditory and for the visual methods of presentation are not very great in the general averages, but they are quite uniform throughout his tables. The main results indicate that, in general, auditory presentation is better for younger children than the visual, and is better than the visual if the material is familiar. For older children and for unfamiliar material the visual is

better. In interpretation of this double relation to age and kind of material he suggests (1) that for younger children school methods of teaching lay greater stress upon auditory processes, whereas with older children teaching proceeds more by visual methods. The age difference thus reduces itself to a difference in the amount of practice for the two senses. (2) In auditory presentation the sound stimuli enforce themselves upon the attention more readily than do the visual in visual presentation. (3) In auditory presentation it is easier to translate familiar material into visual terms than it is to thus translate unfamiliar material. (4) The visual preception of unfamiliar material is easier than its auditory perception, whereas this difference does not exist for the familiar.

The comparison of the amounts recalled for the other combined methods of presentation does not show a uniform and decisive difference.

The Psychology of Association. FELIX ARNOLD. Archives of Philosophy, Psychology and Scientific Methods, No. 3; April, 1906. Columbia University Contributions to Philosophy and Psychology, Vol. XIII., No. 4. Pp. 80.

The writer gives first a critical consideration of the data in which association is to be found, with special reference to the relation of association and the unity of consciousness. In this he discusses activity, emotion, and cognition, with the general outcome that all consciousness is present consciousness, and all consciousness is consciousness of an object. Thus there is no consciousness of self-activity. In introspection we do not observe a past mental state. In emotion we are conscious of our body in a special way, and as an object. In cognition, in the perception of an object, there is no consciousness of mental activity. The image is equally an object of consciousness, to which a different attitude is taken. Having reached this general result, the writer turns to consider the question how unity of consciousness under these circumstances is possible, and whether atomism is a necessary outcome of any associationist's theory. He finds two kinds of unity: (1) The unity of concomitance, in which a single background — the visual field or the bodily feelings — holds together the discrete elements. (2) Serial unity, represented by the meaning, in the present moment, each succeeding state in a series attains through being given position in the series. Both kinds of unity already imply association, and atomism is thus not the outcome of association, but, on the contrary, would be the result if there were no association. This discus-

sion serves as introduction to a more special consideration of association. He next reviews: (1) The treatment of association by the English writers, especially Locke, Berkeley, Hume, Hobbes, and the Mills; (2) the results obtained by German and American experimentalists, in the main, Wundt and his associates. In general, the former have been in quest of laws of association, while the latter have pointed out that the so-called laws of Aristotle and the English writers are not basic, are not laws, but forms of association, of which the experimental data show a very large variety. With this the question becomes whether it is possible to establish any laws of association. He examines the reduction of association by similarity to association by contiguity, and *vice versa*, and finds that each involves a confusion that results from a mixture of different points of view. The reduction of similarity to contiguity involves a fallacy consisting in a 'mixture of the physiological and logical points of view, in the explanation of a psychological occurrence.' The attempt to reduce contiguity to similarity confuses, he thinks, the physiological and genetic standpoints. In his own interpretation of the simple fact of the succession of two associated mental states he offers the 'law of redintegration' as ultimate. This he states as follows: "Any element tends to reinstate the entire moment of which it previously constituted a part, which moment tends (1) to diffuse itself along some one of the paths which have been already formed; and (2) to leave a trace of itself as a whole for future revival and development."

In the reviewer's judgment nearly the first half of the study is not of such a nature as to come within the limits of a *scientific* treatment, and is thus not covered by the title. On the other hand, a large portion of the results of memory studies that could hardly be neglected in a presentation of the psychology of association is not considered. Both, however, are only defects of title and do not detract from the value of the study otherwise.

F. KUHLMANN.

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Ueber sogenannte 'frei steigende' Vorstellungen und plötzlich auftretende Aenderungen des Gemütszustandes. Sind die Verbindungsglieder, welche hierbei in Frage kommen, unbewusst oder unbemerkt? F. KIESOW. Arch. f. d. ges. Psychol., 1905, VI., 357-390.

The old question of 'mediate' association is again taken up somewhat at length by Herr Kiesow, who, to aid him in his arduous labor,

called into service the various observations of his wife, the latter furnishing the examples on which he worked.

Before discussing his paper I should suggest a change in the name of the terms used in this connection. 'Free revival' a literal translation of '*frei steigende*' is in English an equivocal term. It includes the case in which association operates in the recall of a self-sufficient idea, as opposed to fusion, assimilation and complication. I should suggest the expression 'spontaneous rising' of ideas as the equivalent of '*frei steigende*,' in discussions of mediate association.

Herr Kiesow's conclusions are not startling, but his examples are good, and in addition they form very interesting reading, giving as they do some insight into the household economy of a German psychologist.

Herr Kiesow concludes that there is no spontaneous rising of ideas, that there can be no revival without association (p. 370), and as to whether the mediating members are marginal or subconscious, the author concludes, after mature deliberation, that they must be marginal, as the examples show. He also concludes that determining features are the feelings and dispositions roused on such occasions.

It seems rather harsh to criticise adversely a study in which every thought of the psychologists concerned was centered on the result, in which even culinary arrangements were subordinated to the psychological aim. But do not the various observations, which are exceedingly naive, seem to indicate that instead of an intense introspective analysis we have rather portions of a *journal intime* spiced with occasional psychological expressions, as, 'mental,' 'reflection,' 'mind,' etc.?

What is absolutely lacking in this and in other similar studies is a rigid examination of the actual moment of consciousness present in moments of association. The old sausage-link idea of consciousness set forth by Hartley and Hamilton (who first mentioned mediate association), is assumed in such investigations, and then the theory is made to fit this standpoint. By a kind of psychologist's fallacy, the *result* of association, *i. e.*, explication of a disposition in serial order, is considered as the *prior* state of affairs in consciousness, and the question in mediate association is then to find the missing link. But as a matter of fact there never was such a link in any present moment of consciousness. This process of logical reversion does not exist psychologically in the present moment. If we consider that in the present moment of consciousness there is present a disposition with meaning, with concomitant attitude, with a tendency forward and fromward,

which may become serially realized at any part of the system, then it seems more evident that mediate association is not only not a problem, but also a myth, a relic of the logical fallacy of the English psychologists. Any study which bases its conclusions on the link idea of consciousness seems to me to be of worth only in showing to how great a length incorrect notions can sometimes go. This dilettante method of investigation seems to me to require a more strenuous backing of intensive analysis, of *existential* meaning, before the *formal* aspects are so positively enumerated.

FELIX ARNOLD.

NEW YORK CITY.

The Psychology of the Simple Arithmetical Processes: A Study of Certain Habits of Attention and Association. CHARLES E. BROWNE. *Am. Journ. of Psychol.*, 1906, XVII., 1-37.

The substance of this article is a discussion of the introspection obtained from eight subjects on their processes in adding, subtracting, multiplying, and dividing, under very simple conditions. In addition to characteristic details for the individual subjects, the author believes that he finds certain general principles involved in the processes of all. The most important of these may be restated as follows:

1. The addition process is derived from the counting process, as is shown by the fact that successive sums are formed with ease inversely proportional to their difference, *i. e.*, to the value of the added digit; which would follow naturally from the condition that the strength of association between numbers varies with their distance apart in the number series, conformably to the laws of Ebbinghaus for successive syllables.

2. The motor representation of the sum and new digit in continued addition is extremely important, as leading over directly to the motor representation of the new sum, through direct associations formed in previous learnings of addition tables.

3. Simple subtraction is at first a process of adding in reverse order, and therefore more slow and difficult than addition, since the associations are more feebly operative backwards. But it soon becomes a process of direct association by the habitual joining of definite digits in this way. (On this point, however, the author is somewhat obscure.) Subtraction in which borrowing is involved is simplified by adopting the older method of adding to the subtrahend, since the borrowed term is thus kept in representation through fewer successive steps in the process.

4. Multiplication is abbreviated addition, but depends largely on direct association in the multiplication table. Division is a reversal of the multiplication process, but tends, even more than subtraction, to become a process of immediate association of digits. In written multiplication and division the writing of the digit in the product or quotient tends to become automatic and to occur while the processes leading to the next digit are going on.

The author apparently believes that the carrying and borrowing processes and the subtraction in division are, in all subjects, largely processes of visual representation.

The real merits of the paper are somewhat obscured by a too rigid adherence to an unwieldy topical scheme, which makes the reading hard and interpretation a little uncertain in places.

KNIGHT DUNLAP.

UNIVERSITY OF CALIFORNIA.

On a New Method for the Study of Concurrent Mental Operations and of Mental Fatigue. W. McDUGALL. British Jr. of Psychol., 1905, I., 435-445.

Experiments on the distraction of attention have usually been conducted by having the subject perform two mental tasks concurrently (*e. g.*, to add figures spoken to him while he recites verses), or by comparing work done under the influence of disturbing sensory stimuli with work done in its absence. These methods have two drawbacks: (1) they do not guarantee the uninterrupted direction of attention to one task, and (2) they do not provide an objective record of breaks in the attention-process that would enable us to study the way in which the attention is distributed between the two tasks. The following method overcomes these drawbacks (1) by demanding a continued maximal voluntary concentration of attention, and (2) by giving a graphic record of any failure of continuity of attention and also an objective measure of the accuracy with which the task has been performed. It can be applied to a number of interesting problems such as mental fatigue and recuperation, and the influence of drugs and of sleep upon capacity for mental work.

The apparatus consists of a brass cylinder covered with a sheet of white paper on which are eight parallel rows of small red spots, each row surrounding the cylinder. The subject sits before the cylinder as it rotates carrying the rows of red spots vertically downwards. His task is to mark each spot in one row with the point of a stylograph containing black ink. The red spots succeed one another at a vertical

interval of 5 mm. The spots in any one row form an irregular zigzag line, so that the subject, in aiming the stylograph at each oncoming spot, has to move it a little to one side or the other. Each row has 120 spots, and as the spots are 5 mm. apart in the annular direction the subject has the same fraction of a second for the accomplishment of each aimed stroke. The extreme lateral deviation of the spots in any one row is 10 mm., but no spot deviates from the line of its predecessor by more than 5 mm. Within these limits the succession of spots is as irregular as possible, so that the subject cannot learn the order of the deviation of the spots. The difficulty of the task depends upon the rate of movement of the cylinder; it remains the same as long as the velocity does not change. The subject sees and marks the spots as they appear through a horizontal slit.

In studying the concurrent or intercurrent performance of two different mental operations the subject is set to mark the spots while the cylinder revolves at a rate which requires a maximal effort of attention. At the same time he is set another task, *e. g.*, reacting with the left hand to auditory signals. These reactions are also recorded on the drum. Thus the degree of reciprocal interference of the two processes may be studied.

The rest of the paper reports experiments upon the influence of fatigue, of drugs and of rest upon capacity for mental labor.

The errors of marking were reckoned thus: the complete omission of a mark or an extra mark between two spots was reckoned one error, and a lateral deviation of the mark of more than 1 mm., or a vertical deviation of more than 2 mm., was reckoned half an error. The width of the slit in the screen was kept at 15 mm., and the rate of rotation of the cylinder varied between one revolution in 23.8" and one revolution in 23.1".

The results of a series of experiments to determine the influence of fatigue during one day are as follows: Paper marked at 8.15 A. M. total errors 80. Repetitions at 15-minute intervals until breakfast at 9.30 show a general increase in errors, 125 being the greatest number. Paper marked at 10.15 A. M. total errors 66. Lunch at 1.30 P. M. The first experiment after lunch at 3.15 gave total errors 65, the smallest number during the day. After this the errors gradually increased until at 11.15 P. M. there were 157 errors.

Two similar sets of experiments show the influence of alcohol and of tea. The following table gives the totals of errors for these drugs and without them. The first experiment in each series took place early in the evening and the others followed at 15- or 20-minute in-

tervals. On the first evening no drug was taken. On the second evening 3 oz. of whiskey in warm water was taken, and on the third evening 2 cups of tea. After 5 days three similar series of experiments were made on three consecutive evenings, but the amount of the drugs was decreased to 1 oz. of whiskey on the second evening and one cup of tea on the third evening. The effects of these drugs appear very clearly in the following table. These figures represent the totals of errors under alcohol and tea and without drugs. The first row of figures gives the total number of errors in the experiments on the first three evenings, and the second row of figures gives the errors on the second three evenings:

	Normal.	Alcohol.	Tea.
First series (4 papers marked)	379	583	273
Second series (3 papers marked)	298	351	291

TABLE SHOWING INFLUENCE OF SLEEP.

Paper marked at 6.45 p. m.	108
Paper marked at 7.45 p. m.	85
Between 7 and 7.30 sleep was taken.	

The onset of fatigue differed greatly in individual cases.

The tendency of this process to become mechanical can be overcome by marking alternate spots.

ELIZABETH A. ASHBURNER.

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PATHOLOGICAL.

Psychiatry: a Text-book for Students and Physicians. STEWART PATON. Philadelphia and London, J. B. Lippincott Company, 1905. Pp. xii + 618.

American psychiatry was formally born with the appearance in 1812 of Benjamin Rush's classic *Medical Inquiries and Observations upon the Diseases of the Mind*; its youngest child is Paton's book, to which may also be applied a remark in the publisher's announcement of Rush, 'the work is valuable and highly interesting for intelligent readers of every profession.'

Paton is a disciple of the newer gospel in psychiatry, which is seeking to free itself from the traditional dogmatic-symptomatologic teaching of the past, so strongly tainted with metaphysical and even theological speculation, and to establish itself upon the foundation of scientific accuracy.

In the order of his book the author follows the routine of most psychiatric writers in devoting the introductory chapters to general con-

siderations of etiology, symptomatology, etc., after which the various disease groups are taken up. It may be disappointing to students and to other readers, who are not widely informed in mental diseases, to find here so frequent expression of uncertainty, so many chapters ending without conclusion, some subjects being represented by the mere statement of varying opinions. This to the student may indeed prove a disadvantage, — to a certain number of students at least. What is, however, true of all the biologic sciences, — that the status of knowledge is in constant flux — is very particularly true of psychiatry; and not only so, but in this department especially is the total number of established and accepted facts disappointingly small, when compared with those known in other branches of medicine. This is an important although unwelcome truth and it is one of the merits of the book under consideration that it is not categorical, that it does not treat the subject of insanity as if it were a closed chapter in medical science, that often in a given subject it sets forth various possibilities and there leaves the question.

Psychiatric literature of recent years, particularly from the viewpoint of refined scientific clinical analysis, is stupendous, and to all this Paton has endeavored to be true, so that his work may be said to contain an epitome of the opinions of many of the more conspicuous current writers, especially in Germany, in which country at present psychiatric activity is far and away greater than anywhere else in the world. This manner of treatment is agreeable to one somewhat familiar with the subject, and will be appreciated by the student raised to the discipline of individual and research work. It is a question, however, whether the book would not render greater service to the general medical student if it were made a little more direct and personal, reflecting more of the author, perhaps even at the expense of overlooking some of the other cited authorities.

From the Greeks and Romans we have inherited the belief that insanity could be roughly resolved into three fundamental disease-conditions, and the names for these conditions — mania, melancholia, and dementia — have likewise been handed down from the Greco-Roman period. That this is not the whole story, or indeed the true story, only the psychiatry of later years has definitely pointed out, and to this end Paton's work is a valuable contribution. The need for work in the new direction can be appreciated when it is remembered that in New York state, which leads the others in the organization of psychiatric teaching, all the state hospitals are still officially pledged to the Greco-Roman classification imposed upon them by the Lunacy

Commission in 1888, the classification being modified merely by the adoption of Circular Insanity from the French and Paranoia from the Germans, and by the subdivision of dementia.

Paton compares the methods of teaching in this country with those in vogue in Germany, and emphasizes the urgent necessity of establishing psychiatric clinics here in connection with the various universities, which shall be on the same footing with the medical, surgical, neurologic, pediatric clinics, etc., and whose director shall occupy the chair in psychiatry on the University Faculty. This is the only way in which the level of American psychiatry can be materially raised. The movement has already been initiated, and to Ann Arbor belongs the credit of having opened the first university psychiatric clinic in this country.

The modern psychologic viewpoint in psychiatry is another subject upon which Paton lays special stress. As is well known, the relations between the alienist and the psychologist as specialists are none too close in any country, and particularly in America is the need indicated for a nearer *rapprochement* of the two sciences. The importance and value of the psychologic experiment as applied to mental cases has been sufficiently demonstrated, and the psychiatry of to-day is largely the work of alienists who are psychologists as well, of men of the stamp of Wernicke, Ziehen and Kraepelin.

In his grouping of the psychoses, Paton follows somewhat closely the Heidelberg school. Mania and melancholia, the two main diseases of the antique classifications, preserved in the nosographic schemata of Cullen and Chiarurgi, and introduced to the modern stage by Pinel, are not recognized by the newer teaching as separate and distinct disease-entities. Certain of the cases previously so classified have been found by a careful study of their 'clinical course,' which embraces the life-time of the patient, to belong to a peculiar dementing process, to which Kraepelin, adopting the term from Morel, has given the name 'Dementia Præcox.' Most of the remaining cases of both the mania and melancholia groups, have been brought together with the *folie circulaire* of Falret and Baillarger, into one category — *maniaco-depressive insanity*, whose distinguishing character is that as a rule successive attacks occur during the lifetime of the individual, sometimes of a pure depressive or pure maniacal, sometimes of an alternating, and sometimes finally of a mixed type — without, however, terminating in any conspicuous mental reduction.

All of Paton's categories are styled 'disease groups' rather than disease-entities — thus indicating the imperfect state of our classifica-

tions, and allowing for the possibility of a future subdivision of the various forms. Following the Somatics, he gives an important place to various metabolic forms of alienation, devoting separate chapters to Myxœdematous and Cretinous Insanity, Chronic Intoxications, including alcoholism, morphinism, cocaineism, etc., and autointoxication psychoses. The latter would seem a rather questionable head under which to assemble together the febrile deliria and infection-psychoses, the so-called acute confusional states, the collapse delirium of Weber, the Amentia of Meynert, and the Syndrome of Korsakoff. Of the various epochal psychoses described by various authors, Paton retains only one group, including the senile or involutional forms, of which he describes depressive, excited and paranoïd states, and Senile Dementia.

The book, considering its scope and method of treatment, is a condensed one — almost too condensed; but it serves efficiently to present the actual status of psychiatry as a science; it indicates clearly the distinction between fact and fancy in psychiatric analysis — a distinction which many writers have not sufficiently emphasized; it points out some of the more accessible points of attack in dealing with the modern problems of psychopathology; it sets forth the particular needs for the future development of the science in this country; it draws attention to certain anomalies of our social organization, the correction of which should closely accompany the diffusion of knowledge of the broader questions of modern psychiatry.

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- *Zur Frage der motorischen Asymbolie (Apraxie)*. K. HEILBRONNER. *Zeitsch. f. Psychol.*, 1905, XXXIX., 161-205.

Before attempting to describe the contents of this paper, I wish to state how I have translated some of the terms used by the author: kinæsthetic center = Sensomotorium; kinæsthetic nerves = sensible Nerven; nerves of the surface senses = sensorische Nerven; motor nerves = motorische Nerven; circular reactions = *Eigenleistungen des Sensomotoriums*. It is regrettable that the German terminology in this field is so terribly awkward, a result, obviously, of the rather limited interest which the creators of this terminology took in normal psychology.

Aphasia is the generally adopted term for loss of or disturbances in word ideas, or the nervous functions corresponding to word ideas. Asymbolia is a more recent term for loss of or disturbances in objec-

tive ideas (as contrasted with word ideas), *i. e.*, ideas referring to objects or objective (*e. g.*, spatial) conditions. As aphasia may be either of various kinæsthetic forms or of a surface-sensory nature, so asymbolia may be kinæsthetic asymbolia or surface-sensory (*e. g.*, visual) asymbolia. The former kind of asymbolia is called apraxia, the latter agnosia; and the patients apractic and agnostic (the epistemologists will pardon us for the use of this word!). The symptoms of asymbolia, as of aphasia, are to be found, of course, in motor irregularities. The irregularity, as the author emphasizes, may be of one or the other kind: either a disturbance of a certain movement, or a substitution of a perfect but non-adaptive movement for the one to be expected. It is an entirely irrelevant question whether the subject is conscious or not conscious of his action or of any purpose of this action. What is of interest here is the causal connection between sensory stimulations and motor results, not consciousness, which may or may not accompany the act. The idea which comes to be the most prominent in consciousness is not always the one which determines the particular muscular activity. The subject may consciously decide in favor of one thing and yet do the other. Nor is the concept of 'attention' helpful in our comprehension of the pathological phenomena in question. These patients are usually rather attentive when examined, but exhibit their irregularities of reaction none the less. And the special direction of their attention might perhaps rather be regarded as a part or consequence of their inability to act than as the cause of this inability. The patient who, when made to fall upon his knees, continues — through a circular reaction, the kinæsthetic center being unimpaired — a familiar action by folding his hands and raising his eyes for prayer, need not on that account be conscious of an intention to pray. The fact that a patient puts a piece of bread into his mouth does not prove that he has recognized it as bread. The professor, apractic from mere absent-mindedness, who counts the pulse beats of a frog and then throws his watch into the pond and puts the frog into his vest pocket, does not become better understood by us if we decide whether he mistook his right hand for his left hand or the frog for his watch. Thinking of the subject as a self-conscious ego does not aid us in our comprehension of such phenomena. Liepmann's definition of the difference between agnosia and apraxia ought therefore to be modified by omitting his reference to self-consciousness. Liepmann defines the difference by saying that the agnostic's non-adaptive movements result from his *consciousness of non-adaptive aims*, the apractic's non-adaptive movements from his *inability to*

realize his aims. But what is meant here by 'aim' is clearly the complex of ideas in the spectator's consciousness which the spectator regards as the patient's aim, not necessarily any definite state of consciousness of the patient himself. *E. g.*, in the complex 'shooting with a gun' either one of these ideas can be regarded as the starting point of thought or the aim *by the spectator*; but to understand the patient's action we should simply state that they coexist, without calling them by either of these names. Or another instance: we simply cause confusion if we raise the question whether the patient's action in filling his tumbler with dirty water from the wash-basin was purposive or aimless. It is the causal connection between stimulus and reaction which interests us, not the patient's consciousness as such.

As the result of a critical study of cases like those just mentioned, the author recommends that the symptoms of *asymbolia* be classified under the four heads of cortical apraxia, transcortical apraxia, conductive asymbolia (*Leitungsasymbolie*), and agnosia.

1. *Cortical Apraxia.*—Circular reactions are impaired. This seems to be the same as Meynert's 'motor asymbolia.' Anatomically speaking, there is a lesion entirely within the kinæsthetic regions of the cortex. Such a lesion has not been anatomically demonstrated, but from clinical observations appears to be possible. All classes of movements are disturbed, circular reactions as in eating, rising from a chair, etc., as well as strictly voluntary actions, *i. e.*, actions which are not memorized series of muscular activities.

2. *Transcortical Apraxia.*—The kinæsthetic center itself is intact. Circular reactions take place easily. *E. g.*, the patient continues to smoke a cigar put between his lips, swallows what is put into his mouth, buttons up his coat when his fingers are placed at a button, puts a comb like a pen-holder behind his ear after getting it accidentally into the neighborhood of the ear. But *voluntary acts are greatly impaired*, perhaps entirely impossible. And the patient is unable to continue one of the serial acts just mentioned after having been interrupted, *i. e.*, after the circular reaction has been broken. The partial isolation of the kinæsthetic center from the other (surface-) sensory centers makes the ordinary control of the circular reactions impossible. *E. g.*, while the patient's left hand is still filling a tumbler with water, the right hand moves the tumbler towards the mouth.

3. *Conductive Asymbolia.*—The characteristics of this form of asymbolia are *substitution of non-adaptive movements* for the expected movement (*e. g.*, grasping the object before the eyes instead of the

object called for) *and continuance of a position once assumed*, there being no initiative for a change of position (*e. g.*, the patient keeps numerous articles in his hand after they have once been put there). Disturbances of movement are rare or entirely lacking. This form of asymbolia seems to be by far the most common, and its symptoms most variable.

4. *Agnosia*. — This form may be regarded as a composite of mind-blindness, mind-deafness, etc. Irregularities of movement are here purely secondary phenomena.

The first two forms of asymbolia may be restricted to one hemisphere; the latter two are the result of a diseased condition of both hemispheres. The author does not mean that any of these four kinds of asymbolia may easily be observed in a pure form. He admits, on the contrary, that transcortical apraxia and conductive asymbolia are not well separable even in theory, and that mixed forms are much more likely to be found than pure forms. He recommends his classification because he believes that the relation between stimulus and reaction in these pathological cases can thus be most easily understood.

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PHILOSOPHY.

The Limits of Evolution and Other Essays Illustrating the Metaphysical Theory of Personal Idealism. G. H. HOWISON. Second edition. New York and London, The Macmillan Company, 1905. Pp. lviii + 450.

The seven essays contained in this volume present a decidedly bold system of philosophy, original in important respects. Prepared at various times, from 1882 to 1899, and for different occasions, and dealing with a variety of topics, including evolution, German philosophy, modern science, art, religion, immortality and freedom, they embody nevertheless a well articulated metaphysical theory. This, the author's primary aim, he was able to attain chiefly because his system was outlined in his mind from the outset, and merely received fuller specification as time went on. The book thus gives an adequate, though, of course, not a systematic view of personal idealism. It should be added that the essays are thoroughly readable, dealing, as they do, keenly and profoundly with problems of great significance, and employing a style finished in its phrasing, and spiced with neologisms whose aptness will justify them to all but extreme

purists. The second edition has a preface of its own and five appendices, in which Dr. Howison further elucidates positions that have been misunderstood, and undertakes to meet criticisms passed by reviewers, Mr. McTaggart's critical notice being considered in the final appendix.

The system can best be characterized as a modified monadology on a transcendental basis, completing, if adopted, the return of Kant to Leibnitz. The only realities are minds, and the item and order of their experience. These minds do not affect one another in the way of efficient causation, but some experience is an intrinsic part of the constitution of each, and is ordered by the *a priori* activities, which constitute a mind's substantial being; hence matter and its laws. If I understand Dr. Howison, sense cannot reach from mind to mind: so far they are windowless. But their walls are translucent — the author would probably say transparent — to reason. And accordingly, each mind can, and rationally should, order its sense world in coöperation with all other minds. The orderliness of Nature, he would probably say, suggests that there is, even now, an appreciable amount of coöperation. Among the minds recognized by necessity of reason is the one eternally perfect mind, God: who thus influences the course of natural events solely through the free and reasonable deference to his ideal judgments shown by finite minds, but in that way he is supremely influential. So much for a brief reminder of the main points of the system, which may be assumed to be familiar, at least in outline, to most readers. It fulfills admirably the inspiring dream which presents us wholly free from without, our intercourse with one another being entirely an affair of pure reason untainted by sense.

The author is earnestly aware of the great practical issues at stake. But the proof he offers is coldly intellectual, wholly a matter of logic. It deserves careful and critical consideration.

Dr. Howison's system is founded on the apriority of time, space and the other 'self-active forms of consciousness, . . . that in their unity constitute the substantial being of a mind, in distinction from its phenomenal life.' The proof of this apriority closely follows Kant, with omission however of his redundancy and weaker arguments, and deals chiefly with time as the typical case. The rich resource of learning and the careful elaboration with which the author draws his conclusions from this fundamental promise, cannot, of course, be given in detail, but brief suggestions may be offered, together with indications of some difficulties that occur to me.

With time as the product and creature of our minds, Dr. Howison considers our immortality established. Using his terminology, I should say that our eternity is well made out, but our everlastingness is not so plain.

"The entire proof of our being free lies in showing that we . . . do *originate* judgments, and judgments that are necessarily *true*: . . . we do cognize principles *a priori*, that is *spontaneously*, and not because we are so 'framed' by some other being, or so impelled 'from without,' that we cannot do otherwise." But does this, at most, do more than show us to be free *in these judgments*? May we not be, are we not plainly, trammelled in many other ways? Dr. Howison, to be sure, holds that our *a priori* activity constitutes our substantial being, but I have found no proof that it exhausts that being. Can we look upon the rich array of activities, making up temperament, and differentiating man from man, as belonging merely to the 'phenomenal life' of each? Or, can we admit freedom so absolute as to exclude entirely efficient causation from man to man?

Freedom, on full scrutiny, is found to imply at once *self-definition* and *self-definition*. But full definition implies contrast with other selves, who must be real if the self involved is to be real and really free. So freedom carries with it the validity of conscience, or the recognition of others, equally real and free with ourselves, in sufficient number thoroughly to individuate and define each of us, 'ten thousand times ten thousand, a great multitude which no man can number.' And supremely essential to the defining contrast is the *eternally* perfect being, God, who is real if we are and are free, as we have been shown to be. Thus reason penetrates the shell of the self, and assures us that there are other selves. But can reason, without empirical aid, prove more than *that* others exist, with qualities differencing them from us? Can it unaided discover the greatly differing combinations and permutations of qualities grouped in the myriad selves? And without such knowledge coöperation would hardly be possible, and this would become a chill world, emptied of touch and sympathy with the joys and sorrows of our fellows.

In short, freedom pushed so far as to deny efficient causation among selves, seems to me to encounter very serious practical and theoretical difficulties. Besides the latter difficulties already mentioned, we may remind ourselves that efficient causation among selves and quasi-selves is embedded deep in the continuously tested and intimately interrelated whole of common sense and scientific human knowledge. This painfully wrought structure, submitted for untold generations to

unremitting tests, may be a castle in the air, but before admitting it to be unfounded very rigorous and substantial reasons should be called for.

The substitution of a doctrine of qualified freedom would enable many Kantians to accept the system with its important developments of the transcendental philosophy. But even those who cannot accept it unmodified, will be grateful to the author for his strong and penetrating thinking, and for the important contributions he makes to philosophy, especially for his version of the pluralism that is assuming so significant a place in the thought of the day.

S. E. MEZES.

UNIVERSITY OF TEXAS.

Content and Validity of the Causal Law. BENNO ERDMANN.
Phil. Rev., XIV., 138-165.

The purpose of the paper is to seek a basis for the different methods employed in the sciences of fact. The Greek philosophers believed the fundamental connecting link of all things to be ideas. No successful investigation of this doctrine was made until the time of Hume and Kant. Both concluded that the connection between causes and effects is not a rational analytic, but an empirical synthetic one. Hume thought the connection between cause and effect to be the empirical effect of association. Kant held that it rests upon an inborn uniformity of our thought, and hence is independent of all experience.

It is maintained by the writer:

First. The *presupposition* of all inductive inferences is that the contents of perception are given to us *uniformly* in repeated perceptions, *i. e.*, in uniform components and uniform relations.

Secondly. The *condition* of the validity of the inductive inferences lies in the thoughts that the same causes will be present in the unobserved realities as in the observed ones, and that these same causes will bring forth the same effects.

Thirdly. The *conclusion* of all inductive inferences has purely problematic validity, *i. e.*, their contradictory opposite remains equally thinkable. They are, accurately expressed, mere hypotheses, whose validity needs verification through future experience.

After all has been said on the causal law, both by the empiricist and by the rationalist, there has never been any explanation or proof of the existence of a *dynamic dependence* of the effect upon the cause, Such a dependence has been held throughout the history of philosophy, and the empiricist has endeavored to explain it by the sense of self-perception. But such an attempt is superfluous and misleading. It

only complicates the question by duplicating the given, quite after the fashion of the Platonic Doctrine of Ideas.

The article of which the above is a summary is the first of a series of articles on the 'Content and Validity of the Causal Law.'

J. H. KEEN.

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ETHICS.

De la méthode dans les recherches des lois de l'éthique. GUSTAV SPILLER. Rev. Philos., 1905, LIX., 35-45.

In his discussion of the method to be used in ethical research, the author lays great stress on the need of a scientific investigation of moral laws. For moral hypotheses, he says, cannot be verified by personal experience alone, since this makes neither for progress nor for certainty in ethical matters. He proceeds to give a detailed account of how the scientific method, consisting of scrupulous observation and systematic experimentation, may be applied to the study of morals. By this means alone can accurate or reliable knowledge on the subject be obtained. The scientific moralist, then, instead of creating an ideal type in accordance with his own ideas and environment, will make an exhaustive study of man as a moral being in the past and present, bearing in mind the influence on him of varying conditions, physical, psychological, political, intellectual, etc.

T. BATES.

BRYN MAWR COLLEGE.

BOOKS RECEIVED FROM AUGUST 5 TO SEPTEMBER 5.

Behavior of the Lower Organisms. H. S. JENNINGS. New York, Columbia Univ. Press (Macmillan Co., Agents), 1906. Pp. viii + 366.

Les auto-mutilateurs, étude psycho-pathologique et médico-légale. CHARLES BLONDEL. Paris, Libr. Médicale et Scientifique. Pp. 132.

The Analysis of Racial Descent in Animals. TH. H. MONTGOMERY. New York, Holt, 1906. Pp. xi + 311.

A Non-Surgical Treatise on Diseases of the Prostate Gland and Adnexa. G. W. OVERALL. Chicago, Rowe Pub. Co., 1906. Pp. 228 + 10.

Report of the Commissioner of Education for the Year Ending June 30, 1904. Vol. 1. W. T. HARRIS. Washington Gov. Print. Office, 1906. Pp. civ + 1176.

Institut Solvay: Travaux de l'Institut de Sociologie. Notes et Mémoires. Fasc. (1) *Formules d'Introduction à l'Énergétique Physio- et Psycho-Sociologique.* E. SOLVAY. 1906. Pp. 26. (2) *Esquisse d'une Sociologie.* E. MAXWEILER. 1906. Pp. 306. (3) *Les Origines naturelles de la Propriété.* R. PETRUCCI. 1905. Pp. 230. (4) *Sur quelques Erreurs de Méthode dans l'Étude de l'Homme primitif.* L. WODON. 1906. Pp. 37. (5) *L'Argent et l'Anthroposociologie.* E. HOUZÉ. 1906. Pp. 117. (6) *Mesure des Capacités intellectuelle et énergétique.* CH. HENRY. Remarque additionnelle par E. WAXWEILER. 1906. Pp. 75. (7) *Origine polyphylétique, Homotypie, et non-Comparabilité directe des Sociétés Animales.* R. PETRUCCI. 1906. Pp. 126. Bruxelles & Leipzig. Misch & Thron, Éditeurs.

Fortschritte der Kinderseelenkunde, 1895-1903. 2^{te} verb. Auflage. W. AMENT. Leipzig, Engelmann, 1906. Pp. 76.

NOTES AND NEWS.

MISS MATILDE CASTRO, Ph. D. (Chicago), has been appointed instructor in philosophy at Vassar College, in place of Miss Grace Bruce, who goes to Columbia University to resume her work for the higher degree.

DR. HARVEY CARR, of the University of Chicago, has been appointed instructor in psychology in the Pratt Institute of Brooklyn to succeed Dr. Irving King, who goes to the University of Michigan.

DR. W. K. WRIGHT, of the University of Chicago, has been appointed instructor in psychology and philosophy in the university of Texas to succeed Dr. Warner Fite, whose call to Indiana University was noted last month.

DR. J. E. W. WALLIN, instructor in philosophy at Princeton University, has been appointed professor of psychology and pedagogy in the State Normal School at East Stroudsburg, Pa.

WE learn from *Science* that the series of stereoscopic cards to accompany the exercises in Professor Titchener's 'Experimental Psychology' has now been published and may be obtained of the Chicago Laboratory Supply Company.

THE following are taken from the press :

DR. W. B. SMITH, recently elected to the chair of philosophy at Tulane University, will spend the coming year in Europe on leave of absence. His place will be filled meanwhile by Dr. Percy Hughes, instructor in philosophy at the University of Minnesota.

THE George Combe lectureship in general and experimental psychology at the University of Edinburg will be filled by Dr. W. G. Smith, who withdraws from his position as lecturer in experimental psychology at Liverpool University.

J. W. SLAUGHTER, Ph.D. (Clark), will deliver a special course of lectures on psychology at London University through funds provided by a donation of Mr. Martin White, which also provide for lectureships in sociology and ethnology.

THE PSYCHOLOGICAL BULLETIN

METHODOLOGICAL IMPLICATIONS OF THE MIND-MATTER CONTROVERSY.¹

BY PROFESSOR H. HEATH BAWDEN, *Vassar College.*

THE BEARINGS OF THE CONSERVATION DOCTRINE.

The bearing of the conservation doctrine on the problem of mind and matter is bound up with the twofold meaning of the term 'causation.' Professor Strong holds that 'the causal relation necessarily implies sequence,' and that if two events were simultaneous they could not be causally related.² Recent science and metaphysics, on the other hand, have exhibited a tendency to substitute a conception of pure continuity or identity for the idea of sequence. "If this process could be applied throughout," says Professor Höffding, "we should reach the paradoxical result that the complete explanation of causality involves the very abolition of the causal concept; for the causal relation is only differentiated from the purely logical relation of identity between cause and effect by the temporal difference between the terms."³ This distinction between the empirical and the logical notions of causation, according to Professor Hyslop, is the same as that between efficient and material causation.⁴ On the confusion of these two different points of view rests, he says, the apparent triumph of the theory of psychophysical parallelism. Probably the other writers would agree with Professor Höffding that "an equivalential relation does not exclude a qualitative difference, but directly presupposes it" (p. 103), *i. e.*, that it is impossible to free ourselves from the historical elements in our knowledge.

¹ This number has been prepared under the editorial care of Professor Bawden.

² *Why the Mind Has a Body*, pp. 68-69.

³ *Philosophical Problems*, p. 95.

⁴ *The Problems of Philosophy*, Chapters X. and XI.

But the fundamental problem methodologically concerns the significance respectively of these two conditions and demands of knowledge: the historical and the logical, the genetic and the analytic, sequence and identity. An analysis of the principle of conservation ought to throw light on this point. If quantitative continuity is impossible apart from qualitative discontinuity, then these opposed aspects of sequence and identity represent only a functional distinction and the argument for parallelism as it is commonly understood undergoes a vital transformation. Professor Hyslop, for example, maintains that the conception of an efficient causal nexus between the physical and the psychical "is quite compatible with a difference of their nature and may be necessary to accept the unity of action with that difference which we actually observe" (p. 452). Modern materialism, he says, means the substitution of the idea of material, for the idea of efficient causation in the interpretation of the relation between the physical and the psychical (p. 398; cf. p. 451). His discussion of this point is suggestive and may be quoted at length.

"But the strange part of the controversy at this point is that the procedure of the parallelist and materialist alike was the abandonment of the position which each should have taken. If the materialist had accepted the conclusion of the spiritualist, as he should have done, and if the spiritualist had accepted the materialist's theory of conservation, both would have come to an agreement and left nothing but a difference of terms to distinguish between their views. The spiritualist ought to have seen that his argument against materialism, as a denial of the persistence of consciousness, depends for its effectiveness upon the acceptance of the materialist's doctrine of the conservation of energy, and that the materialist was wholly inconsequent when he insisted upon the integrity of his traditional theory after assuming the identity of the mental and the physical, or a material causal nexus between them. If the physical is convertible with the mental, as this material causal nexus assumes, then motion and consciousness are identical, and the persistence of the one implies the equal persistence of the other. The eternity of matter and motion must imply the eternity of consciousness, because there can be no distinction, by hypothesis, between it and motion. We cannot reduce them to identity without admitting the force of what is meant by 'consciousness' as well as 'motion.' What the materialist thought he could do with impunity was to identify the two things and deny the previous implications of 'consciousness' altogether, or affirm their identity by assuming the falsity of their difference and yet retain the implications of universalizing 'motion'

without recognizing 'consciousness' at all. But he cannot do this on any theory of material causation alone. He must accept 'consciousness' in the system with all that it means and consider that 'motion' abstracted from 'consciousness' no more exists independently than 'consciousness' without 'motion.' The materialist ought to have seen that his application of the conservation had involved a total abandonment of the position for which his theory had traditionally stood" (Hyslop, *The Problems of Philosophy*, p. 403).

The materialist 'must either reconstruct his method or concede the limitations of the conservation of energy' (p. 403). All that the arguments for parallelism have proved is the inapplicability of the principle of material causation or identity to this relation. The possibility of efficient causation or real productive agency remains untouched. And the principle of conservation of energy, for the same reason, since it is only a formulation of the fact of identity on the quantitative side within the physical world, does not affect the possibility of qualitative changes. "In the entire organic world of living beings and the inorganic world of chemical compounds, science has found a system of metamorphoses due to chemical laws that exhibit almost any capacity to exercise functions or to manifest attributes not found in the elements. This is a conception that is wholly independent of the doctrine of the conservation of energy, because the facts represent qualitative changes for which there is no pretense of explanation by that doctrine" (p. 463). Thus parallelism does not meet materialism so far as it is based on efficient causation.

"Parallelism thus fails to achieve its desired victory simply because materialism depends upon more than one assumption. As has already been remarked when discussing materialism, the proper course of parallelism was not to have denied the materialist's application of 'mechanical' or material causation, but to have pressed its *ad hominem* value for logical deductions which were just the contrary of what the materialist supposed, instead of conceding an assumption about the reducibility of all physical 'phenomena' to modes of motion which ought never to have been granted and instead of accepting responsibility for an *ad rem* argument to prove that consciousness was not such a mode, a negative proposition which can never be proved. In other words, the parallelist ought to have exposed the contradiction between the materialist's principle and his conclusion, the first being different from and the second being the same as the old materialism. The metamorphosis of the old materialism having been abandoned in the conception of the conservation of energy, the same conclusion should not

have been drawn. The parallelist should have accepted the challenge which the conservation of energy presented and instead of trying to limit it he should have pressed its necessary consequences, applying it with the universality which was claimed for it, and thus insisted that the qualitative change involved in the process of evolution involved no loss of identity whatever on the theory, and hence that consciousness was as much an element of the antecedent as the antecedent, motion, was an element of consciousness. The assumption of material causation with its implication of identity between the two terms of the series would have obliged the materialist to admit in the antecedent the same fact that he found in the consequent. There would have been absolutely no escape from this conclusion short of an abandonment of the qualitative interpretation of the conservation of energy. The materialist cannot apply material causation or identity to the relation between physical and mental 'phenomena,' or motion and consciousness, without accepting in it the full meaning of consciousness, the second term of the series, as well as the physical, the first term — that is, without admitting that the physical is as much of the nature of consciousness as the mental is of the nature of motion. The last term in the series of evolution, on the theory of conservation, has at least as much significance as the first and actually must be said to have been contained in it, so that the materialist cannot admit a qualitative difference of any kind between the terms of this series without giving up the universality of his explanatory principle. He cannot, on the theory of conservation interpreted as implying qualitative identity between the antecedent and consequent, exclude consciousness from motion and introduce it as a new moment in the series. He must make as much of consciousness as motion and treat their identity as his principle requires, instead of implying their identity in one breath and denying it in another" (pp. 463-465).

REALISM AND THE RELATIONAL THEORY OF CONSCIOUSNESS.

A number of recent writers have united in conceiving consciousness as a relation or a type of relationship. This is so obvious a meaning of the term that the full significance of it methodologically is apt to be overlooked: we look for something more imposing and mysterious perhaps.

Professor Dewey has recently done for the terms of 'conscious' and 'consciousness'¹ what he had previously done for the word 'idea'²:

¹ *Journ. of Philos., Psychol. and Sci. Methods*, III., pp. 39-42.

² *Same Journal*, I., pp. 175-177.

on the basis of a study of Murray's Oxford Dictionary he sets forth the leading types of meaning which these words represent and convey.

In this article on 'idea' he sums up his discussion with this question: "Are there really and truly any such independent psychical entities as the Lockean ideas, or have we in ideas as just psychical *simply a more adequate methodological device for facilitating and controlling knowledge?*" (italics ours). In this sense (which Professor Dewey credits to Professor James), an idea is any content of experience which is used as an intermediary for getting another content, or, to use his own words, "the idea is a mental state for the sake of referring easily and fluidly to *any* object in *any* phase, and thus freeing and facilitating our intercourse with things."

In the article on the terms 'conscious' and 'consciousness' the same point of view is manifest. The word 'consciousness' originally meant joint or mutual awareness — a social fact. *Con* + *sciousness* meant two-persons-knowing-together. It then comes to mean *being conscious to one's self*. Here the idea of 'together' contained in the 'con-' is equally prominent: the agent is reduplicated, as it were, and we have self-consciousness. The individual is cognizant of himself in another capacity: his present cognitional attitude has for its content the memory of himself in a practical or some other non-cognitional attitude. The original social significance of the 'con-' has been carried over into the individual: he is a socius. Consciousness thus comes to be the mark of (socialized) persons as opposed to (unsocialized) things. Finally, consciousness comes to mean the 'condition and concomitant of all thought, feeling and volition,' and this 'condition and concomitant' is hypostasized as mind, soul or subject. The fact of togetherness of the contents of experience is erected into a separate realm of being. The relationship is entified, is converted into a separate substance or reality. When this transformation has been wrought, the term 'consciousness,' as Professor Dewey remarks, 'begs as many metaphysical problems as is likely ever to be the privilege of any one word.'

Professor James has summed up his position in a brief article in the *Archives de Psychologie*, entitled 'La Notion de conscience.'¹ Consciousness, he says, as this term is ordinarily used, does not exist; it exists no more than does the matter that Berkeley demolished. What does exist and is rightly expressed by this term 'consciousness' is the capacity that the contents of experience have of being recalled or known. This capacity is explained by the fact that certain experi-

¹ Vol. V., No. 17 (June, 1905).

ences serve as intermediaries for relating other experiences which, when thus connected, figure on the one hand as things-known and on the other as subject-knowing. This dual functioning of its contents may be stated wholly in terms of experience, without invoking any transcendent reality. This distinction of object and subject, represented and representative, thing and thought, is a functional, not an ontological one. Things and thoughts are not fundamentally heterogeneous: they are made of the same stuff, the stuff of pure experience or experience in general. Mind, as Professor Santayana hints, is a sort of fore-shortening of experience: mind is 'knowable and important in so far as it represents other things.'¹

In other words, his theory, in place of the dualism of consciousness as an essence, entity or pure spiritual activity, on the one side, and the contents of that consciousness, on the other, supposes the existence of the content only. In place of the dualism which makes the fact that the contents of experience go together in a certain way into an ontological existence, he substitutes the conception of consciousness as *the way in which we have this content*, the experiencing of this content under certain conditions.

This idea has been expressed by the present writer by insisting on the functional character of the distinction: consciousness is the process as contrasted with the content of experience, the How as opposed to the What. It is the distinction between *what* we experience and *how* we experience it: consciousness is the way in which we get or have the content. Theoretically any content may serve as the bridge over to any other content. Anything may serve vicariously for anything else. All symbols or media were originally contents having intrinsic value. Their transgredient reference grows out of the function they serve as handles or hints or cues or clues to something else. Certain parts of experience come to serve this end of mediation with relative permanency, such as gestures, words, ideas; and these by a methodological hallucination have been given an independent existence as realities in their own right, whereas their independence is one of function only, not of existence. Consciousness is not an entity but a function, not a distinct content but the law of the process by which the contents go together in certain ways.

Professor Stratton virtually makes this the differentia of the mental and the physical when he says that 'mental and physical existences are to be distinguished by their behavior.' "When I look at the paper on my desk I say that I have before me both a psychological fact and

¹ *Reason in Science*, p. 164.

a physical fact, because these are two things which behave in different ways. The psychological fact, the visual appearance, may be destroyed by a mere wink of the eyes, and called into life by opening them. The physical object can be destroyed by fire, and I do not know how it can be restored at all."¹ The illustration of the 'paper' is reproduced because Professor Stratton here does not seem to be true to the functional principle which he has himself invoked. When I look at the paper before me I am not conscious of two sets of facts. So far as vision is concerned, the paper (not the mental fact, but the paper as a physical fact) is there or is not there according to whether all the conditions of its being there are present or not (in this instance, according to whether my eyes are open or not). There are no adequate grounds for asserting that the visual paper, which I may annihilate and recreate at will, is any less physical than the paper as it is for touch or for kinæsthetic sense.

But although the particular illustration may not stand, Professor Stratton's principle seems to be a sound one and the only one possible in a genetic psychology: the difference is one of behavior or function. There is a lack of continuity in the mental experience or, as Dr. Perry puts it, an imperfection.² The criterion of the psychic is found in the disorganization and reorganization which an experience undergoes in its metamorphosis from one 'objective' plane to another. Suppose the ink-bottle which stands on the table before me appeared and disappeared unaccountably and capriciously. Suppose at some times it were visibly present and at other times its place were visibly empty. Suppose that at some times I could feel it and dip my pen into it but at other times I could get no such response. I would conclude that the ink-bottle was an illusion or that some one was playing a trick upon my senses. If sometimes I could ink the tip of my pen in this fitful ink-bottle and at other times the same act left it dry, I should either look about for the practical joker or suspect myself of some strange pathological hallucination. I should relegate the experience to the realm of the mental or purely subjective. Now this might not be a correct inference at all, but it would illustrate how the category of the mental as a distinct realm has arisen. The essence of the physical nature of the object appears to be its relative stability or permanence for certain purposes, for certain sense-coördinations. If I could not always see it but could always feel it I should unhesitatingly attribute its capricious visual character to a defect in my sight, but still regard

¹ PSYCHOLOGICAL BULLETIN, III., p. 2 (January 15, 1906).

² PSYCHOLOGICAL REVIEW, July, 1904, p. 282.

it as having objective physical reality. But if it should elude touch and resistance as well, it would become either nothing at all, or if I still had an intermittent experience of it, I should be inclined to relegate it to the purely mental sphere of illusions or hallucinations.

M. Binet in his *L'Ame et le Corps*, as will be seen in the review which follows in this issue of the BULLETIN, emphasizes this same character of imperfection in the phenomena which are called mental: it is the still incomplete world of our experience. But Professor Höffding, on the other hand,¹ protests against the alleged discontinuity of consciousness, which is thus contrasted with the continuity of matter. He holds that our conscious life forms a totality, a continuum, a little world for itself. Mental phenomena 'do not present such great discontinuity or such pure qualitative differences as is often believed' (p. 39). It is interesting to note, however, that even on his identity hypothesis such qualitative differences and such discontinuity remain a methodological surd (cf. pp. 31-32). The realistic implication of his critical monism is evident when he says that 'the empire of being may be much vaster than the possibilities of our experience' (p. 143), and when he says: "Knowledge, however rich and powerful it may be, is after all only a *part* of Being" (p. 114).

Professor Woodbridge has expanded the idea of consciousness as a relation in its avowed realistic implications in his article on 'The Nature of Consciousness.'² Consciousness, he says, is a kind of continuum. "The relation of the world of which there is consciousness to consciousness involves the same kind of problems as the relation of objects in space to space, or the events in time to time. We do not ask if space and time affect their objects causally. We should not raise the question of the causal efficiency of consciousness. We do not ask how things get into space, so we should not ask how objects get into consciousness" (p. 120). "Consciousness may be defined, therefore, as a kind of continuum of objects" (p. 121). In an utterly naive experience things are apprehended no more as external objects than as subjective mental states: they are immediately appreciated values. They are neither things nor thoughts but states or acts. I am no more immediately aware of objects as states of consciousness than I am aware of things as states of space. The experience of things in a consciousness continuum is as much a secondary and derivative experience as the experience of things in a space or time or species conti-

¹ *Philosophical Problems*, p. 26 f.

² *Journ. of Philos., Psychol. and Sci. Methods*, Vol. II., No. 5 (March 2, 1905).

num. They are all alike in belonging to the reflective type of experience.

But may the consciousness relationship, as the realists assert, have an existence independent of the objects or 'terms related? Professor Woodbridge admits that consciousness 'is found to exist only when it has a content' (p. 119), but he insists that the objects "stand out as the objects *of which* there is consciousness, but never as the consciousness itself. Just as objects in the light are not the light, so objects in consciousness are not the consciousness. There is thus a distinction between consciousness and its objects" (p. 119). If he means this only as a methodological distinction, this certainty is true, but if he means it, as his other statements seem to suggest, in the sense of realism, it does not seem to the present writer to be true. The distinction is true only for the specific situation. The distinction arises only when the problem arises of passing from one content to another. Then consciousness itself is objectified; it is treated as a bridge over to another content. It is only for the psychologist that this distinction tends to become a permanent one, since it is he alone who is interested in trying to find out what consciousness is in itself.

Here is a spinning top. We cannot ask what the spin is apart from the top: it would be like asking for the grin without the cat. We cannot drain off the relation on a wire like an electric current or skim it off like cream from a pan of milk. Try to catch the spin and you stop it and what do you have? The top? Yes and no! No, since a top which is not spinning is not the full reality of a top: you simply have a permanent possibility of a top, a potential top, since a top is something which spins. Stop the spin and you get something, to be sure, but it is not top. We call it a top, but only as an artifact, if we think closely. Similarly, as Professor Baldwin has pointed out, a microscopically thin slice of the cortex of a human brain is not brain, since you have killed it in order to study it. A brain is not its full reality as a brain except when it is conscious. Matter is not its full reality as matter except when it is thinking. The converse, of course, is equally true, that just as it would be foolish to attempt to state the spin apart from the top, so it would be absurd to attempt to state consciousness apart from brain. Mind apart from matter likewise is an artifact. Attempt to state what mind is as a content and you always get a physical statement. Investigate the nature of an emotion, a sensation or an idea and you find nothing but what is statable in physical terms. Matter is simply mind construed, interpreted, just as the 'top' is what you get when you take hold of the spin to see what it is like.

Just as the reality in the one case is the spinning-top or the top-spinning, so the reality in the other case is matter-thinking or thought-finding-hands-and-feet.

Professor Woodbridge says: "Just as it is possible to find out about things much that is interesting which does not depend on the fact that they are in space, so also it is possible to find out much that is interesting about objects which does not depend on the fact that they are in consciousness" (p. 120). But this does not recognize the obvious fact that 'finding out things that are interesting' is simply an instance of this togetherness of contents of experience which we mean by consciousness. The category of consciousness or the knowledge category occupies a unique position in relation to all the other categories, not in being a distinct category in kind, but in being, as the idealist holds, the key to all the other categories. It is not simply one relation among others: it is relationship as such, the *sine qua non* of all the others, the keystone in the arch of relations. It is functionally the category of categories. The relation of the content or object of consciousness to, in, by or for consciousness is the key to its relation to, in, by or for space, time, species or any other continuum distinguished by reflective thought. Indeed, the consciousness continuum would seem to be nothing more than a generic name for these other continuums. When one wishes to speak of the bare fact of the way the contents of experience go together without specifying any particular way such as space, time, etc., we resort to the concept of the consciousness continuum. The space, time and other continuums are simply specifications of this general conception of experience as process. For example, the physiology of the brain is simply a specification of the consciousness relation in spatial and temporal terms: it is finding out how certain contents of experience go together to produce the experience which I have — not only in terms of the feelings and sensations which because of a lack of objective control I call mine, but also in terms which can be controlled and stated and which, therefore, are socially accessible, statable and verifiable.

The statement, therefore, that 'two continuums of the *same* kind cannot be parts of each other,' that 'they stand over against each other as closed systems,' is no argument for 'the isolation for any individual consciousness' (p. 121). Indeed, two continuums of the same kind are not conceivable, in the strict sense in which the term must be used in such a discussion as this: they would constitute one continuum, not two, if they were really of the same kind. The whole point of framing the notion of a continuum is to reduce like things to uniformity.

It is the differences between things which leads us to the conception of different continuums, not their likeness. If consciousness is a continuum, there is but one such continuum, not many; and individuality resides not in the mutual exclusion of like continuums, but in the different ways in which the contents of this universal continuum go together within it. For example, my individuality is dependent on the fact that the contents of the consciousness continuum go together in certain space relations and time relations as they do not for you. The contents of experience stand in a certain relation to each other at this particular point in space and time that we agree in calling my organism, and in a somewhat different relation at another point that we agree in calling your organism. It is the standing together, the acting together, of the contents of experience in these diverse ways that constitutes the difference between individual centers of experience, not the mutual antagonism of closed systems. Indeed, all that Professor Woodbridge says of the reciprocally representative character of the objects within the consciousness continuum (cf. pp. 121-122) suggests rather the social character of consciousness than its isolative individualistic unsharable character.

It is important to note, as Professor Woodbridge states and as Professor James has urged, that knowledge is "wholly determined in its content by the relations of the objects in consciousness to one another, not by the relation of consciousness to the object" (p. 122). Since consciousness is simply a generic term for the fact of relationship among the contents of experience, it cannot itself be regarded as in itself a peculiar type of such relationship. "We know what our objects are and what we may expect from them, not at all by considering their relation to consciousness, but to one another. The relation to consciousness is the same with each one of them, expressed by the preposition *in*, and is, therefore, not a distinguishing relation" (p. 122). "The fact, therefore, that knowledge of what objects are depends on the fact that they are in consciousness, in no way determines the nature of objects. We may say, consequently, that the peculiar form of connection or continuity which consciousness constitutes between objects does not affect their nature, but simply makes them known or knowable, and known with all their variety of distinctions from a thing to a thought" (p. 122).

It is true that to say that objects are related to or in consciousness is simply to say that they are objects. But this is not true when the consciousness relation is specified as some particular kind of consciousness relation, *e. g.*, the space relation, the time relation, etc. Per-

ceiving an object, seeing a table, for instance, does make a difference to the object as much as handling it, striking it with a hammer or setting fire to it. It is just the failure to specify this consciousness relation that to the present writer appears to be the source of the realistic implication which Professor Woodbridge finds in the relational theory of consciousness. Consciousness as the abstract form of all relationship does not determine anything, just because here, by definition, all contents have been abstracted from. But since in every specific instance of consciousness the contents of experience go together *in a determinate way*, and this going together *is* their existence as objects, it is no more true to say that the objects are *given to* knowledge than that they are *constituted by or in* the knowledge process.

Dr. Montague in a very suggestive article¹ has stated the methodological drift which has culminated in this relational theory of consciousness. The backward state of the science of psychology is due, as he says, to its persistent use of methodological categories which are elsewhere outworn and discredited. "Every object of study, except consciousness, has first been regarded as a substance, second, as a group of qualities, third, as a relation between other objects. The conceptions of consciousness, however, if we except the theories of Leibnitz and Herbart, have generally alternated between the first and second of these methodological categories" (p. 316).

But that this relational theory of consciousness, which results from applying this third method to the psychological datum, implies a realistic metaphysics, as he maintains, is not so clear. With Professor Woodbridge, Dr. Montague says that "all relations presuppose the existence of terms between which they subsist. If consciousness is at length to submit to the same scientific treatment that we accord to other phenomena — *i. e.*, if it is to be equated to a mode of relation between things — it must inevitably be regarded as secondary to those things. Consciousness, in short, must be thought of as inhering in its objects rather than its objects inhering in it." "If consciousness is a relation, objects of consciousness must be real independently of their standing in that relation, while conversely, if objects are real independently of a consciousness or knowledge of them, then that consciousness or knowledge cannot be anything other than a relation between them" (p. 313).

But this is not being true to the methodological conception of relation as employed in science. There is no more warrant for seeking to

¹ 'The Relational Theory of Consciousness and Its Realistic Implications,' *Journ. of Philos., Psychol. and Sci. Methods*, Vol. II., No. 12 (June 8, 1905).

reduce the relations to the terms related than for seeking, with the idealists, to reduce the terms to the relations. Why not regard the relations as simply a statement of the *way* in which the terms exist and regard the terms as the statement of the *content* related. Consciousness would then express the *how*, objects the *what* of experience; and this would seem to be the inevitable issue of a relational theory of the nature of consciousness rather than either of the traditional metaphysical views.

In any case, it appears to the present writer that we are in sight of a solution of the problem in the sense that solutions usually are found for philosophic problems — the recognition that it isn't a problem after all but a shadow or ghost of our own faulty dialectic. The metaphysical problems which baffle the synoptic thinker grow out of the exigencies of the development of technique in the special sciences. This problem of mind and matter is a crucial instance. We create our own difficulties, though they are none the less real on that account. The more necessity, however, that the philosopher should be a faithful student of the way of working of the man of science. All method is a sort of hallucination, and we have the task of threading our way out into the sanity of a more self-conscious illusion. We need to recover the original innocence of our naive attitude toward things without losing any of the gains made by dealing with them in the more sophisticated way. The situation appears to be the almost paradoxical one of being at once deluded and perfectly conscious of the delusion. Yet this in a sense in all the ages has been the value of philosophy to man; he has answered his own questions chiefly by discovering reasons why it is irrelevant to ask them.

PROFESSOR STRONG'S THEORY OF CONSCIOUSNESS.

I.

THE LAW OF PSYCHOPHYSICAL CORRELATION.

Professor Höffding has remarked that it would be dangerous for the identity hypothesis if it could be 'demonstrated that the psychical phenomena come *before* or follow *after* the physiological states,'¹ a position which Professor Strong defends at some length in his recent book entitled *Why the Mind Has a Body*.² Apart from the question

¹ *Philosophical Problems*, p. 50.

² Pp. 68 f.

of fact, to which physiology does not seem likely to give a decisive answer for a long time to come, there is an important aspect of the problem on the side of method. Are we to conceive of consciousness as correlated with the entire circuit including the external stimulus, the sensory nerve paths, the brain center, the motor nerve paths and the motor effect in the muscles and in the external world, or as correlated with a restricted portion of the brain process such as the cortex? The ordinary view of biologists and psychologists alike, the view advocated by Professor Strong, is that the 'immediate correlate' of consciousness is some special portion of the brain process. The ambiguity in the term 'immediate' and the tacit implication of the spatial localization of the mental, suggest that this is the basis of the individualistic isolative conception of consciousness which in Professor Strong's book determines the answer given to the abstract problem of the relation between mind and matter.

Psychophysical correlation as a working hypothesis in science is an attempt to give an empirical statement of the relation between the brain and consciousness: it is "an empirical law," says Professor Strong, "on the same level as that of Weber."¹ "This law includes two propositions: first, that consciousness as a whole never occurs except in connection with a brain-process; secondly, that particular mental states never occur except in connection with particular brain-events."²

Let us suppose a situation. I am sitting at my desk looking at the sheet of paper on which I am writing. The paper with the written characters inscribed on it is the material object which at this moment is the visual content of my consciousness. Now imagine that I am a biologist seeking to find the nervous basis in the cortex of this visual experience. In order to do so I must observe my own brain-state. In order to do this let us imagine a vivisectional experiment in which by trephining the skull my own brain-state is laid bare. By a system of mirrors, as Professor Strong suggests, I am now observing my own brain-events.

But it will be objected that if I am looking at my own cortex, I am no longer looking at the paper: the content of the visual experience has changed. In order to obviate this difficulty let us further imagine that by a method of artificial nutrition of the tissues this portion of the cortex is removed from my head and placed on the paper before me. Its vital connections — nervous and the rest — are supposed to be kept intact by artificial devices somewhat as Professor Foster manipulated the circulatory apparatus in his famous experiment.

¹ Pp. 37-38.

² P. 66.

Under these conditions, then, the brain-state which is by definition the neural condition of the perception of the paper, is itself an object of perception in the same visual field with the paper. It is lying in the center of the sheet of paper. The brain-state is in the focus of the field, if you please, and the paper constitutes the margin or background.

In such a case, is it not obvious that consciousness (in this case the visual sensation) is correlated no more directly with the cortex than with the object, no more with the central nervous process than with the peripheral stimulus? No more and no less. Consciousness is the standing-together-in-relation of these two things in this particular way. It is a descriptive term for a certain kind of behavior. It is the way the universe acts at a certain point in space and time. It is the how, the meaning, of these things (which by themselves or in other relations we call physical objects) when they operate on each other. This relational view of the nature of consciousness, as it has recently come to be called, if true, certainly involves a reformulation of the law of psychophysical correlation which connects consciousness *immediately* with the brain-process.

Dr. Morton Prince defends the point of view of Professor Strong, and in reply to a criticism of their common theory, by the present writer,¹ says: "It would seem that it must be owing to his failure quite to grasp the problem that he says: 'It is difficult to see why the brain process, when thus experienced from within, should be called the 'actuality,' while the same brain process when viewed by a second person is only 'the symbol of it.' I may deceive myself, as we are all liable to do, but the reason seems clear to me. What Professor Bawden calls 'the brain process, when experienced from within' is a state of consciousness, say a musical note; but that musical note, when viewed (ideally, of course) by a second person, would be perceived as brain motion, and motion could, of course, only symbolize a musical note" (*Philos. Rev.*, July, 1904, p. 446).

Now the difficulty with the theory represented in this passage is this: it assumes that consciousness is somehow connected exclusively with the brain-state. In order to show more clearly what is conceived to be the error of this conception, suppose we simplify the illustration used by Dr. Prince (without, however, doing any violence to his meaning) by reducing it to terms of the imagery of one sense (vision), instead of two (vision and hearing). Let us suppose that it is a visual experience instead of an auditory experience, that instead of a 'musical

¹ *Philosophical Review*, May, 1904, pp. 312-314.

note,' it is a 'sunset.' Let us analyze the passage thus restated. It would read as follows: "What Professor Bawden calls 'the brain process, when experienced from within' is a state of consciousness, say a sunset; but that sunset, when viewed (ideally, of course) by a second person, would be perceived as brain motion, and motion could, of course, only symbolize a sunset."

Is it not true that the 'brain process' is an arc only in the total circuit, which includes the ether vibrations coming, in this instance, from the sun? Is it not true that the visual 'state of consciousness' here is to be correlated, not exclusively with the 'brain process,' but with the entire system in which *both* 'brain process' and 'sun' (ether vibrations) are factors? If so, then the conscious experience that I call 'sunset' is an event which takes place when there is a certain re-adjustment between these factors within this dynamic system or circuit.

Let us analyze the illustration a little further. Dr. Prince has said that the brain process when experienced from within is a state of visual consciousness (sunset). "But," he adds, "that sunset, when viewed (ideally, of course) by a second person, would be perceived as brain motion, and motion could, of course, only symbolize a sunset." (These are his words as reconstructed for the sunset in place of the musical-note illustration.) My sunset, when viewed by a second person, he says, would be perceived as 'brain motion' and not as a panorama in the Western sky, and hence can only be symbolic of this panorama: it cannot be said that it *is* the panorama. The brain motion is the symbol of which the panorama is the reality.

But, now, if my consciousness (of sunset) is correlated, not simply with 'brain process' but also with 'ether vibration,' in what sense can it be said that the second person in looking into my brain sees that which to me is the panorama of the sunset? He sees but one factor of the circuit which is the real correlate of my consciousness. If this second person is to 'view' the 'sunset' ('musical note' in the other illustration) which to me is the 'real' panorama, he can only do so by likewise bringing the ether vibrations (as well as my brain motions) into the same circuit with the visual center in his own occipital cortex.

I see sunset when my organism comes into a certain relation with ether vibrations traveling from the sun. *You* see sunset when your organism comes into a similar relation with the ether vibrations. You see *my* sunset only if, in addition to your organism and the ether vibrations, you bring into your organic circuit molecular agitations in my

brain. You do not see the physical basis of my consciousness when you look at the agitations in my brain center alone; you must include the whole circuit, the ether vibrations as well. And if you do this, in what sense is a part of the content of your experience ('brain motions' in my head) any more symbolic of my 'sunset' than the other part (the 'ether vibrations' which you interpret as *your* sunset)? We here would have the interesting result that the content of the experience of one person is symbolic of the content of the experience of another person, that your psychical is symbolic of my psychical, or, if it is insisted that sunsets are something physical, then it would be one physical (yours) symbolic of another physical (mine) — an interesting, but not a startling result. In other words, the illustration does not prove in any way that my sunset is any more real than the brain process which you see in my occipital lobe: they are equally real or unreal, since there must be this common element of the ether vibrations. It is no more true that the brain process which you perceive in my head is a symbol of my experience of the sunset than that the sunset which you experience is the symbol of my sunset. No more true, and no *less* true. Both may be true, but what does it signify?

Of course, you may, if you please, let the brain process which you see in my head stand for the sunset, just as you can let the star on the map stand for the capital of a state, and in this sense the brain process may be said to symbolize the sunset. But this clearly is not the sense in which the word is used by Dr. Prince. In this sense of the term anything may be symbolic of anything else.

Your experience of the sunset, to be sure, is probably different from my experience of it, but this is not more of a problem (and not less of a problem) than the difference between two leaves on the same tree. We see different sunsets because we are different organisms, and, even supposing that our organisms were identical in every other respect, we would see sunsets differently simply by reason of the fact that we occupy different points in space.

The whole difficulty turns on the conception of the nature of consciousness, as shown in this doctrine of the seat of consciousness. Consciousness does not have its 'seat' in the 'brain process,' taken alone. It is not true that the 'state of consciousness' is simply 'the brain process when experienced from within' (words which Dr. Prince quotes from my article). It is this, but it is much more also which Dr. Prince fails to include, which failure, as I see it, is the source of the difficulty in his view and in that of Professor Strong.

II.

THE DEFINITION OF REALITY OR CONSCIOUSNESS.

Professor Strong's definition of consciousness is unsatisfactory and inconsistent with certain of his own arguments. Reality is formally defined as "something that exists of itself and in its own right, and not merely as a modification of something else."¹ Consciousness alone is real, judged by this test, because it "cannot be conceived as a modification of anything else, but exists in its own right."² But "material objects, though in everyday speech we call them real because of their steadiness and independence of our will, are not realities, since they are only abstractions from our consciousness, and require it in order to be conceived."³ "Consciousness exists in its own right." "Consciousness, then, is a reality." "It is the very type of reality . . . the *prime* reality."⁴

In another passage he incidentally admits that "the reality of an object signifies its membership in an order in space and time existing for all similarly organized percipients."⁵ That is, reality means relationship, the fact and the possibility of standing in relations, as Lotze and Green have urged. This view of the nature of reality seems to be implicitly accepted further on when it is stated that "the reality of an object is not identical with the reality of the perception as a mental state; that the reality of the object consists, not in the actual existence of the perception, but in its permanent possibility. . . . This object is not a datum of sense but a construction of the intellect."⁶ 'Construction' by the intellect certainly involves relationships, and it would seem therefore from this passage that the reality of the object is due to the relationships by and in which the object is constructed.

The question is: Which conception of reality does the author mean to stand by as expressing its essence — the idea of existence 'in its own right' or the idea of 'membership in an order'? On the face of the matter these are incompatible views as to the nature of reality, or if not, it behooves him who says they are compatible, to make this fact clear.

The same difficulty appears in his doctrine of things-in-themselves, the ultimate reality. "By 'things-in-themselves,'" says Professor Strong, "I understand realities external to consciousness of which our perceptions are the symbols."⁷ He has already said that "the objects we immediately see and touch are modifications of consciousness."⁸

¹ P. 194.² P. 195.³ Pp. 194-195.⁴ Pp. 199, 203, 210.⁵ P. 225.⁶ Pp. 235-236.⁷ P. 211.⁸ P. 178.

"We have resolved matter into our perceptions."¹ He holds, therefore, that 'the body is a symbol of a reality external to consciousness.'² That is, certain contents of consciousness which we call physical objects are the symbols of realities which are not contents of consciousness. By symbolizing is meant that they stand for these realities which in their fullness, at least, are not contents of consciousness; they are experienced not immediately but mediately; they are not perceived but inferred. He admits that things-in-themselves not only exist but in addition are 'symbolized by our perceptions.'³

But if things-in-themselves are present in consciousness symbolically, just to this extent they are genuinely present. Is anything ever experienced in any other way? Is not everything that is experienced experienced in terms of the relations in which it stands, *i. e.*, in terms of its reference to something else, *i. e.*, as symbolizing something else? What does one mean when he says he has had an immediate or direct experience of a thing? Does this mean anything except that for a certain purpose or from a certain point of view this is the essence of the thing? And if this is all that can be meant by immediacy, does not everything stand equally condemned at some time or other or from some point of view? If everything that is *in* consciousness is present there only in terms of its relations to other things (*i. e.*, symbolically), this cannot be the distinguishing mark of those realities or things-in-themselves which are said to be *external* to consciousness. Thus the very doctrine of symbolism would drive him to accept a different definition of reality from that with which he formally sets out.

Professor Strong says that "we are dependent for our conception of the nature of reality upon experience,"⁴ yet says that beside the empirical knowledge of science we have metaphysical knowledge, which is 'knowledge of the non-empirical,'⁵ which 'distinguishes the legitimate kind of non-empirical existence, such as other minds, from the illegitimate kinds.'⁶ "Another man's mind," he says, "is in the strict sense of the term a non-empirical existence; something real, yet inaccessible to my immediate knowledge."⁷

But how can something which is non-empirical be real if we are dependent for our conception of the nature of the real upon experience? One stands dumfounded before these two kinds of knowing; one kind of knowing that knows and another kind of knowing that does not know! No wonder the author is driven to add, a few pages further on, that "the relations of things here are a trifle complex.

¹ P. 214.

² P. 212.

³ P. 211.

⁴ P. 284.

⁵ P. 231.

⁶ P. 232.

⁷ P. 216.

. . . We are face to face again with that mysterious phenomenon of doubling . . . a sort of optical illusion."¹ One would have thought that this, together with his 'non-rational leaps,' and the necessity of appealing to 'pre-rational instinct' for links in his argument, would have led to a reëxamination of the presuppositions upon which the argument rests.

III.

THE FALLACY OF HYPOSTASIZING CONSCIOUSNESS AS PROCESS.

Professor Strong hypostasizes the form or process of consciousness as opposed to its content. 'Consciousness itself,'² which he identifies with 'thoughts and feelings' as opposed to 'perceptions,'³ he holds to be more immediate and ultimate than the content of consciousness, than material objects, for example, which constitute the content of our perceptions. "Consciousness," he says, "is the only reality of which we have any immediate knowledge."⁴

In an article in *Mind*⁵ Professor Strong narrows down the term 'consciousness' still more, virtually making it synonymous with reflective cognition. This he illustrates by two types of experience: experience of 'pain' and experience of 'blue.' "When we contrast a pain with our consciousness of it, the fact we refer to by the 'consciousness' is these supernumerary thoughts" about the pain.⁶ "The existence of the mental state is . . . entirely independent of the intellectual consciousness by which we reflectively apprehend it. But the existence of the mental state is by no means independent of consciousness in the sense of feeling. . . . Material objects, like mental states, exist as feelings."⁷ Hence "the existence, side by side with the function of thought, of a function which we may call feeling: the difference between the two being this, that by the function of thought we are made aware of things other than the consciousness of them, while in feeling we are immediately aware of the concrete nature of the feeling itself."⁸

Similarly in the case of the experience of 'blue,' when one distinguishes between blue and the consciousness of it, the contrast is "that between blue as an immediate experience and certain thoughts that he has about it." "In other words, the 'consciousness' of the blue is the consciousness of its relations to other things."⁹ "So far as sensation is unaccompanied by thought, we are not aware in it of anything distinct from our own states of mind."¹⁰

¹ P. 248.

² Pp. 194-195, 207.

³ Pp. 214, 286.

⁴ P. 295.

⁵ April, 1905, p. 175 f.

⁶ P. 175.

⁷ P. 176.

⁸ P. 180.

⁹ P. 181.

¹⁰ P. 183.

These passages bring the problem of the nature of consciousness to a focus: Is consciousness fundamentally cognitive in character or is there an aboriginal element more simple than we call feeling? Is the difference between feeling and cognition one of kind or only one of degree? Professor Strong holds that "by the function of thought we are made aware of things other than the consciousness of them," namely their "relations to other things."¹ The crux of the difficulty is in the word 'aware.' Later he says: "The fact that we are not aware of, in the sense of immediately experiencing, that which we think is perhaps most clear where what we think of is another person's mind."² And "the case of other minds is the type of all cases of objects of thought: *Whatever is thought of is eo ipso absent and merely represented, and never in any case given as an immediate experience.*" "The only way to be *really* (*i. e.*, not representatively) aware of ourselves is to have (= be) the thoughts and feelings in which our being consists."³

This is the culmination of the abstraction; process and content of consciousness are at last completely divorced. Here at least we may see the methodological implications of the attempt to separate the *what* from the *how* of experience. We are to think a content ('another person's mind') without that content in any way reacting into the way in which we think it. That upon which we think in no way affects the thinking. Judgment has no relation to judging; what is cognized bears no relation to the cognitive experience.

It is not without significance that the most general term for the relations in which the contents of experience stand is derived from a word which expresses the knowledge relation: *con + sciousness*. Attempts have been made to substitute the term 'sentientcy' but they have not been successful. Even this term, moreover, has in it a cognitive element. In spite of all the attempts to keep them apart by tripartitists and bipartitists alike, the element of awareness runs through all mental states, and this would seem to be sufficient justification of the use of a term expressing the knowledge relation as the general term for all conscious states. We more frequently speak of a 'painful feeling' and even of a 'blue sensation,' and not of a painful idea or a blue concept, simply because in *thought* the distinction between the two has been made explicit in terms of the imagery of objective control, whereas in *feeling* it is still implicit or only vaguely stated in terms of those total reactions characteristic of the inchoate imagery of emotion.

The psychological paradox of solipsism which puzzles Professor

¹ P. 180-181.

² P. 185.

³ P. 185.

Strong and so many other writers grows out of just this separation of the process and the content of consciousness. One writer says: "No direct apprehension of conscious life is possible to any one but the subject of that life,"¹ and if it is true that the individual can have no knowledge of external reality save through the affections of his own consciousness, of course the whole epistemological problem is upon us. "How can a particular individual be in such relation to a reality which transcends and includes his own existence as to know it?" asks Professor Stout.² How solve this "paradox that what is evidently one reality should be in two places at once, both in outer space and in a person's mind?" asks Professor James.³ How is it that the percept of a big tree gets into the little head of a man?

In an article on 'Idealism and Realism' in the *Journal of Philosophy, Psychology and Scientific Methods*,⁴ Professor Strong indicates his position quite clearly: Common sense says that the tree I see is a reality external to my mind. But physiology shows us that my perception varies with my brain-state: it may be an hallucination. How then can I be sure that there is any external tree? We seem to have three things to deal with: the tree, the perception of the tree, and the brain-state. We are then in the following dilemma: *either* we must suppose that the perception varies at once with the brain-state and at the same time with the tree, which is contrary to fact in such a case for example as that of the hallucination, *or* we must suppose that while the tree is really there we never directly experience it but something which stands for it—a mental image represented by the brain-state. Does not the mistake lie in assuming the extra-bodily tree to be *without* the mind,⁵ neglecting to observe that the object (tree) is only another name for the perception (the content of the perception), consciousness (the perceiving) being simply a name for *the way* in which we experience this content?

In his book⁶ Professor Strong says: "I do not make an object more real by deigning to perceive it." "Suppose a pane of yellow glass," he says, "to be interposed between the object and the eye: the result is to alter the brain-event in the sense of yellowness, without producing any change in the object." "Under these circumstances the object is seen yellow: which shows that the perception varies with the brain-event, and not with the object."⁷

¹ Solomon, *Mind*, January, 1905, p. 82.

² Stout, in Sturt's *Personal Idealism*, p. 3.

³ *Journal of Philos., Psychol. and Sci. Methods*, September 1, 1904, p. 481.

⁴ September 15, 1904, p. 524.

⁵ P. 525.

⁶ P. 237.

⁷ P. 174.

But this is surely a mistake. To mention nothing else, the object certainly is different just to the extent that now it has a pane of glass in front of it, and if this be a pane of 'yellow' glass this means that certain rays of colored light are intercepted. Surely, it makes a difference to an object if its relations to the dynamic system of nature are altered in however slight a degree.

The fundamental error lies in supposing that perception, or that any conscious experience, is a process connected exclusively with brain-events. These constitute simply one phase or arc in the total circuit which embraces the object perceived as well as the perceiving organism. And to add the assertion that "the very existence of the object in any given case is a doubtful inference, which not the single perception but only the concordance of many can justify,"¹ is to beg the whole question, for the relation of the object perceived and the subject perceiving would be the same even though all the so-called perceptions should prove to be hallucinations. Hallucination is not a peculiar form of perception in which there is no object perceived: there is always an object as the content of perception. The difference is that in a hallucination the object does not conform to the demands of *other* habits of perception. The assumption of 'some kind of two-fold existence of the object'² is entirely unnecessary. The fact that physical science states the object in terms of molecules and atoms, of light rays or vibrations of the ether, the fact that physiology states the object in terms of the retinal image and neural changes in the cortex, in no way militates against the introspective evidence that we know the object 'face to face.' The truth is that these are each of them only partial statements of the nature of the object. Mr. Ward has forever laid this fallacy in the following passage from his *Naturalism and Agnosticism*:³

"Imagine two physicists saying, 'Here is a magnet; it has contrary properties at opposite ends. Let us divide and conquer.' 'I will take away the south pole to my laboratory and investigate that,' says the one; 'and I will do my best with the north pole in mine,' rejoins the other. This is what happens when psychologists propose to study internal experience, and naturalists external experience, exclusively. Our imaginary physicists when they get to work find, the one that a north pole, the other that a south pole, has turned up at the fracture of the original magnet. The psychologist in like manner finds objective elements in his internal experience; but he calls them subjective modifications, and the physicist in external experience finds

¹ P. 175.² P. 172.³ Vol. II., pp. 198-199.

subjective elements, but he calls them laws of nature. When the imaginary physicists meet again and join up the magnet, each is puzzled to know what is gone with the new pole that he had discovered. Similarly with the psychologist and naturalist: except that the joining up is here the serious business. All your side is subjective modification, says the psychologist, perhaps. No, all your side is laws of nature, the naturalist then replies. Or, the psychologist, having treated intelligence, in sensationalist fashion, as a mere outgrowth of isolated individual experience, and the naturalist having treated universal experience as mere nature divorced from mind, they agree that the objects of one are copies, the objects of the other originals, and then comes the riddle of their extraordinary correspondence."

"What each one immediately deals with in experience is objective reality in the most fundamental sense. But first it was styled a picture or impression; probably because on the retina of the percipient an optical image of the things he looks at can be seen by another. Then, when the progress of science showed that our so-called sensory impressions cannot be literal representations, or copies, they lapsed into vicarious representations, or symbols, of the objects of universal experience. Finally came the vexed question: How does the individual or how do any number of individuals, all confined to vicarious symbols, attain to an acquaintance with the real originals assumed to lie beyond?"¹

IV.

THE INDIVIDUALISTIC CONCEPTION OF CONSCIOUSNESS.

For Professor Strong consciousness is essentially individualistic. There are no inter-mental breezes blowing, as one of his critics has said. Each person is forever limited to the circular panorama of his own consciousness.² Minds are mutually exclusive. "I can have no rational ground for assuming that anything whatever exists outside my mind."³ The argument from analogy with my own acts involves a fallacy, since, while the thoughts and feelings which give rise to *my* movements are immediately given, those which give rise to other people's movements are not given.⁴ "In short, it is in the nature of the case impossible that consciousness should supply rational grounds for the inference of realities beyond itself."⁵ Hence the necessity to which his argument is put of making a 'non-rational' leap⁶ to a world of things-in-themselves in order to save the theory from solipsism. My belief in the existence of other minds than my own, says Professor Strong, is grounded in 'some deep pre-rational instinct.'⁷

¹ *Op. cit.*, Vol. II., p. 155.

² Cf. pp. 215-216.

³ P. 218.

⁴ P. 217.

⁵ P. 218.

⁶ P. 273.

⁷ P. 274; cf. p. 219.

But Professor Strong has already admitted that we can be conscious of these 'realities beyond' symbolically, mediately; he only denies that we are conscious of them immediately. And we have seen that not only is symbolic existence genuine existence as far as it goes, but that reality is *known* in no other way than by symbols. Is it not then philosophical suicide to seek to carry back the knowledge of other minds to an 'instinct'? Unquestionably knowledge is always more instinctive than it is rational, reason being indeed nothing but the mediation of instincts, but is this not a precarious foundation upon which to rest the whole superstructure of the argument? Professor Strong accepts the view of contemporary psychology that 'mind equals consciousness'¹ and says that 'our essence lies . . . in being conscious.'² But if consciousness is reality, and material objects (perceptions) as well as thoughts and feelings are part of its content, why not stand by the facts? Better frankly be a solipsist, a thorough-going phenomenalist, than fall back on this mystical appeal to the instinctive and the pre-rational.

Professor Strong says:³ "Of course consciousness is not a *permanent* reality, since it is subject to interruptions." But, he adds, "so long as it lasts, it is as real as anything can be. It is the very type of reality, an integral part of the universe of things. Moreover, it is for each of us the *prime* reality—the one part of that universe with which he has immediate contact." "In our experience of our own minds we have immediate contact with a little portion of the real universe." "If consciousness is a reality, we have the premise we needed for the inference of other realities beyond it."

But if in consciousness we do experience reality as it really is, what more can we wish for? He cannot mean just what he seems to say, for if in my own consciousness I do experience reality as it really is, I must, among other things, experience it as social in its nature, which he does not admit. He regards each individual consciousness as somehow particularistic and as becoming social by a 'non-rational' inference or leap in the dark. But experience is more fundamentally social, if anything, than individualistic in character. When something occurs outside of my organism, such as the discharge of a cartridge of dynamite in a stone-quarry, we all, if we are near enough, may share in hearing it and in seeing the rocks fly into the air. If a chemical change occurs in the blood which irrigates the tissues of my body I alone feel the fever and the pain: that is, I alone feel it directly; sympathetic friends may suffer with me indirectly, if my fever and

¹ P. 33.² P. 203.³ P. 210.

pain find overt expression. Since, however, the greater part of the objects and events which make up the content of my experience are extra-organic and a large part of those which take place within the organism are communicable by some mode of motor expression, it follows that experience is more fundamentally social than it is isolative in character. The fact that the mental world is the one which is conceived in an individualistic way, while the material world is the sharable social world of our common experience, suggests at once the origin of the distinction and its legitimate function in present experience.

Professor Strong says that the *memory* of my past experience is a transcending of my immediate experience as much as my knowledge of the existence of other conscious personalities. The example illustrates too well. If the experiences of other persons is as organic with mine as in memory my past experience is with the flying moment of my present consciousness, then there is no difficulty. Interpret memory and association as habit, and interpret the relation of my consciousness to another consciousness in analogous terms, and you get rid of this specious problem.

V.

SPIRITUALISTIC EPIPHENOMENALISM.

It is only upon such an individualistic conception of the nature of consciousness that it would be possible to erect a metaphysics such as that presented to us by Dr. Prince and Professor Strong. Reality, they aver, is ultimately mental in its nature: there is but one reality which each individual envisages in his own consciousness.

"There is only one process," says Dr. Prince, and this process is psychical.¹ The argument of Dr. Prince is as follows: Your brain-state is a part, a content, of my experience. It is an object of my perception, not of yours. For you this brain-state *is* consciousness; for me it is an object or process of change in what I call the material world, *i. e.*, in your brain which is a part of the objective world of my perception. "In other words, a mental state and those physical changes which are known in the objective world as neural undulations are one and the same thing, but the former is the actuality, the latter a mode by which it is presented to the consciousness of a second person."² "The thing-in-itself we know nothing whatsoever about, and therefore we are not justified in making any assertions about it at all. Beyond our own sensations of grayness, of hardness, of smell, etc., we know no more what a molecule of protoplasm, or any other molecule, *really* is — we know no more what the molecule-in-itself is — than we

¹ PSYCHOLOGICAL REVIEW, November, 1903, p. 653.

² P. 561.

know whether angels' wings are tied with pink ribbons or blue ribbons."¹ It might be asked: If we are thus ignorant concerning the ultimate nature of things, how does Dr. Prince justify his conviction that reality ultimately is psychical?

Professor Strong likewise says that his view is panpsychism. The body is the 'symbol' of a reality external to consciousness, this reality being itself other consciousness.² The physical objects which are the content of my consciousness are the 'shadows' cast upon my consciousness by your consciousness (which as such I can not experience).³

But if reality in its truest form is the consciousness that I immediately experience, and this, by reason of the very fact that I do thus immediately experience it, is what we mean by the psychical, by what right is this character read over into things-in-themselves (other persons) which by definition are not experienced immediately by me? If this immediacy of my experience is just what we mean by the psychical, then by attributing this character to things-in-themselves I am bringing them into the immediacy of my consciousness, in which case they are no longer other selves or other consciousnesses, on Professor Strong's theory, but simply contents of my consciousness. Is not this an illegitimate generalization of a category which by definition gets its meaning from the very fact that it is not general but particular?

Again, the physical world, according to our author, is properly 'a perceptual datum.'⁴ But what is the justification for calling the 'perceptual datum' mental rather than physical? The term 'physical object' is just the term which has been set aside to express what is meant by 'perceptual datum.' The fact that science has erred in its assumption of the ontological dualism of mind and matter is no reason for denying the real methodological duality which does exist. It assuredly is no reason for asserting that primary and secondary qualities (*i. e.*, that the properties of matter) are wholly mental.⁵ It is the ground only for the assertion that they represent a functionally distinct aspect of a common existence. Moreover, Professor Strong grants that "perception and perceptual brain-event are *in some sense* correlated."⁶ But why only in the *mental* world? What is gained by the denial of the equal reality of the physical world? The really "amazing thing about this argument," as Professor Alexander has said,⁷ "is that any one could fail to see that it is based upon tacit assumption of knowledge of that very extra-conscious world the possible existence of which it is so strenuous to deny."

¹ *Brain*, 1891, p. 262.

² P. 212.

³ Pp. 283, 309-310.

⁴ P. 180.

⁵ Pp. 180-181.

⁶ P. 181.

⁷ *Journ. of Philos., Psychol. and Sci. Methods*, I., p. 120.

This theory of Dr. Prince and Professor Strong is really a spiritualistic epiphenomenalism — a neat turning of the tables on Huxley's materialistic form of the doctrine. In the one, consciousness is an epiphenomenal accompaniment on brain-states; in the other, brain-states are mere shadows thrown by one consciousness upon another consciousness.

VI.

PSYCHICAL CAUSALITY.

One of the most puzzling developments of the recent discussion of the relation between the two realms has been the extension of the parallelism to causality itself — a belief, in the words of Professor Santayana, "that the mental world has a mechanism of its own, and that ideas intelligently produce and sustain one another."¹ This is one of the chief arguments upon which Professor Strong relies and must not be omitted in the attempt to estimate his theory of the nature of consciousness.

The difficulties which exist on Professor Strong's theory will be patent to those who have read his book carefully and have kept in touch with the controversy which has centered about his argument. It may be briefly recapitulated here: After having laid down the premise that "material objects exist only as modifications of consciousness,"² he proceeds to discuss the possibility of things-in-themselves. By things-in-themselves he means, as we have already seen, "realities external to consciousness of which our perceptions are symbols."³ These external realities are extra-mental, yet, he insists, they are indirectly known. We have a "mediate yet authentic knowledge of them."⁴ He does not show how they can remain extra-mental in spite of our having this knowledge of them. He meets this difficulty by saying that things in themselves are unknowable and therefore presumably extra-mental "only in the sense that they are inaccessible to perception or immediate experience" (as opposed presumably to 'thought').⁵

It is on just this, his theory of perception, that his doctrine of a two-fold causation rests. The distinction is repeatedly made between 'consciousness itself' and its 'modifications,' it being held that "consciousness exists in its own right" and is therefore real.⁶ He distinguishes between "mental facts which are thoughts and feelings and mental facts which are perceptions of matter." "We have resolved matter into our perceptions, and the mind into a series of mental

¹ *Reason in Science*, p. 150.² P. 194.³ P. 211.⁴ P. 234.⁵ P. 233.⁶ Pp. 194-195.

states."¹ "A perception, again, is a phenomenon as the symbol of an extra-mental reality, but in itself as a state of consciousness it is real."² "The reality of the object is not identical with the reality of the perception as a mental state."³

The question to be asked is, whether it is legitimate thus to abstract perception as a mental state from the object or content of the perception, since, by hypothesis, 'objects exist only as modifications of consciousness'? Yet it is upon this abstraction that the duality of the causal relation is made to depend. A reference to one of the author's illustrations will make this point clear. "Suppose I will to move my arm," he says, "and the movement happens. The movement exists only as a perception. Now, while we affirm the volition to be the cause of the movement, we absolutely deny it to be the cause of the perception of the movement."⁴ He supports this by appealing to physiology: "For, physiologically, the movement is one event and the perception of it another, subsequent to the first in time" and involving a different nerve-loop.⁵

Now this argument is possible only by disloyalty to positions which he has himself previously established. If 'material objects exist only as modifications of consciousness,' then the 'movement,' in the illustration, exists only as such a modification. The modification of consciousness in such a case would be what we call perception. The movement, then, would exist only as the perception of the movement: the *esse* = the *percipi*. The appeal to physiology is a vicious circle. If movement, in this case changes in organic behavior, exists only as perceptions, then the whole science of physiology exists likewise only as the science of such perceptions, and it is not possible to hold that 'the movement is one event and the perception of it another, subsequent to the first in time.'

It is the old fallacy of hypostasizing an abstraction. He first says that objects exist only as modifications of consciousness, and then takes it all back in the statement that *consciousness itself* is something different from its modifications and may have an existence by itself and a causal law of its own. 'Consciousness itself,' 'perception as a mental state,' is a sheer abstraction when taken apart from its 'modifications,' when taken apart from its content of 'material objects.' It follows that the distinction between real and phenomenal causation, which is based upon this abstraction, falls to the ground.

¹ P. 214.

² P. 209; cf. 286.

³ P. 235.

⁴ Pp. 245-246.

⁵ P. 246.

PSYCHOLOGICAL LITERATURE.

MIND. AND BODY.

L'Ame et le Corps. ALFRED BINET. Paris, E. Flammarion, 1905.

In Book I., entitled 'Definition of Matter,' the external world is reduced to a mere complex of sensations. We cannot go beyond sensations. They are the only reality we know. The term 'sensation' is employed here somewhat as Locke used the term 'idea' and as Bergson uses the term 'representation,' to express any and every kind of experience on the side of its content, without implying that it is either physical or mental.

Physicists in their attempt to give a precise account of the material universe have reduced its phenomena to terms of certain modes of experience which are most directly quantifiable, in their enthusiasm even sacrificing that accuracy of which it is their chief boast to be the exponents. Light, heat, electricity, sound, motion, are all stated in terms of visual and tactile-kinæsthetic sensations. But why, Binet asks, should sound be stated in terms of sight and touch? What would the tuning-fork or the ear be in terms of auditory sensations? Because they lend themselves to scientific experiment and measurement, visual and tactile-kinæsthetic sensations have become the exclusive imagery of science, but theoretically there is just as good reason for holding that the real world is sound or odor and that it manifests itself in visual and tactile-kinæsthetic terms, as to hold that it really is made up of atoms or energy and manifests itself in the form of sound, odor, temperature, color, etc.

The hegemony of the hand and eye in science is therefore a purely methodological superiority and primacy. Why should one kind of sensation represent the real any more truly than any other? There are no primary and secondary qualities: all sensational experiences are equally real and equally false or equally true. No special group may be taken as giving a more faithful picture of the real nature of matter. The mechanical theory of nature is thus brought under suspicion. It has neglected to reckon with that most obstinate immediate fact—the observer himself—which, properly speaking, is the distinctive datum of psychology. But this perceiving subject or observer can in turn only be stated in sensational terms: the subject is but an object in disguise.

The distinction between mind and matter therefore cannot be carried back to the distinction between sensation and the physical excitant, for the excitant is known only in terms of sensation: the supposed distinction reduces to a distinction between different kinds of sensations.

One of the most serious difficulties which this view encounters is the apparent interpolation of the nervous system between the perceiving subject and the external object. The objection seems to be supported by the doctrine of the specific energy of nerves, in which theory it is implied that the sensation derives its character from the nature of the sense organ or brain process and need not resemble its physical stimulus in the external world. It is apparently supported also by the fact that the nervous system itself can only be known through the nervous system. And the difficulty is further complicated by the fact that whereas the nervous system appears to be the essential prerequisite of having any sensations whatever, yet the nervous system of any perceiving subject is never known by himself in such terms.

This difficulty is met in two ways: first, by denying the existence of a 'perceiving subject' in the sense which the objection implies; and second, by the hypothetical consideration that the nervous system in perception remains unperceived only because it is a constant factor in the situation, whereas the external stimulus is perceived because of its variable character.

Book II., the 'Definition of Mind,' is devoted to the attempt by a critical analysis to get rid of the ambiguous concept of a psychical subject. The author makes an inventory and analysis of consciousness viewed as process or activity. He finds of course that the only terms in which he is able to describe consciousness are those of the physical or material content. He accordingly is led to define sensation, image, idea, emotion, volition, as purely physical or physiological phenomena. Sensation, he says, is not a means of knowing the physical properties of matter; it *is* these properties. Since he rejects any noumenal thing-in-itself, he finds, therefore, that the distinction between the mental and the physical vanishes; he appears to swamp the whole universe now in the psychological categories.

He saves himself, however, from this apparent conclusion from his argument by a distinction between the object of consciousness and the act of consciousness. If matter refers to the content or object of sensation, it does not follow for Binet that the mental refers to an experiencing subject or self. Mind is not something which is conscious (this would only be a covert commitment to realism), but is the fact of being conscious or, as we would say, the How as contrasted

with the What of sensation. Mind is the generic name for the act or process of experience as opposed to its content or object. The mental is not an existence, a subject; such a subject could only be known as are other contents of experience in sensational or ideational terms, as an object among other objects, whereas the mental as such is rather the subject-object relationship.

The problem of mind and matter is, he says, not so much how they came to be identified as how they ever came to be separated, since for the naïve point of view there is no such dualism. His error lies in the supposition that while it is impossible to isolate consciousness from its content, it is quite possible to isolate the content or object of consciousness; or, in his language, consciousness cannot exist apart from sensation, but sensation may exist apart from consciousness. This leads him to attribute an independence and completeness to sensation or matter which he denies to consciousness or mind.

The mental thus stands for an adjusting activity; it is the still incomplete world of our experience. And psychology is itself a science of matter, *i. e.*, the science of that portion of the total complex of our sensations which has the property of preadjustment.

But Binet does not feel the full force of his own argument in certain places where, for example, he maintains that the stimulus may act independently of consciousness whereas consciousness has no existence independent of the object. In short, matter (complex of sensations) may exist apart from mind, but mind may not exist apart from matter. He slips into a realistic way of speaking when he says that our consciousness does not in knowledge add anything to the object. The relations belong to the object; they are given in the object independently of consciousness.

In Book III., the 'Union of Mind and Matter,' the author discusses the four leading theories: spiritualism, materialism, parallelism and Bergson's theory. He finds himself with certain qualifications in closest accord with the last of these. He rejects Bergson's view that the nervous system is merely an equating apparatus because it implies that consciousness is not directly correlated with the brain. But he agrees with this writer in his rejection of the other three views and seeks to supplement what he regards as the defect in Bergson's view by an original speculation with regard to the function of the nervous system in relation to consciousness. This, in a word, consists of supposing that the nervous system contains a constant as well as a variable element. The variable element is that supplied by the external excitant. This, as the changing factor, elicits consciousness, in accordance

with the general law of change as the condition of consciousness. The constant factor is that supplied by the nervous system itself which because of its uniformity remains unperceived even in the act of perception in which it is directly operative.

Life and Matter; a Criticism of Professor Haeckel's 'Riddle of the Universe.' Sir OLIVER LODGE. London, G. P. Putnam's Sons, 1905.

This little book aims not only to be 'an antidote against the specific and destructive portions of Professor Haeckel's' work, but attempts to 'confute two errors which are rather prevalent'; namely: (1) "The notion that because material energy is constant in quantity, therefore its transformations and transferences — which admittedly constitute terrestrial activity — are unsusceptible to guidance or directing control"; and (2) "The idea that the specific guiding power which we call 'life' is one of the forms of material energy; so that, directly it relinquishes its connection with matter other equivalent forms of energy must arise to replace it" (preface).

With the arraignment of Professor Haeckel's so-called scientific monism which, when consistent, appears to be a crude form of materialism, most students of science and philosophy will agree. But with certain of the positions which the author puts forward to take the place of the discarded materialism there will be less agreement.

The author, while holding that the conservation of energy is a sufficiently legitimate generalization, a reasonable hypothesis, yet admits that it is not an experimental fact; the discovery of new forms of energy is possible in the future which will involve a restatement of the law. But, after all, he says, this is not especially important, since in any case the doctrine that the amount of energy is constant is quite compatible with guidance, control or directing agency (p. 20). This idea contains the main thesis of the book: that life and mind may belong to a transcendent realm (*i. e.*, to a world of facts not yet discovered by science) and that they may have directive power without having causal efficiency. "I maintain," he says, "that life is *not* a form of energy; that it is *not* included in our present physical categories; that its explanation is still to be sought." Life 'is a guiding and controlling entity' which nevertheless 'alters the quantity of energy no whit' (pp. 116-117). "Guidance of matter can be effected by a passive exertion of force without doing work" (p. 144).

Especially unsatisfactory to the student of philosophy is the naïve realism of Sir Oliver's position, which indeed is in this respect little

improvement upon the doctrine which it criticizes. "The universe is in no way limited to our conceptions: it has a reality apart from them" (p. 82). His thoughtless citation of Berkeley, that what we call matter and motion are known to us only as forms of consciousness (p. 58), and his own statement that 'it is through the region of ideas and the intervention of mind that we have become aware of the existence of matter,' that the realities underlying our sensations 'are only known to us by inference' (p. 94), that 'matter is the instrument and vehicle of mind' (p. 104), all illustrate the logical confusion which results from the use of unanalyzed concepts even by a distinguished man of science.

This of course determines the attitude which he takes toward the mind-matter controversy. Music must exist, he says, before and apart from an organ or instrument to express it. Indeed it is the agency which fashions the means of its own expression. "The soul of a thing is its underlying, permanent reality, that which gives it its meaning and confers upon it its attributes. The body is an instrument or mechanism for the manifestation or sensible presentation of what else would be imperceptible" (p. 100).

This spiritualistic metaphysics also prevents him from seeing any truth whatever in Haeckel's definition of the soul as 'a sum of plasma-movements in the ganglion cells' or of God as the operation of the evolutionary process and 'the infinite sum of all natural forces' (p. 101).

The book is an interesting and well-intended but disappointing attempt to reconcile the categories of exact science and humanistic idealism.

H. HEATH BAWDEN.

VASSAR COLLEGE.

BOOKS RECEIVED FROM SEPTEMBER 5 TO OCTOBER 5.

- An Outline of the Theory of Organic Evolution.* MAYNARD M. METCALF. 2d ed. rev. New York, Macmillan Co., 1906. Pp. xvii + 212.
- Deutsche Skeptiker: Lichtenberg; Nietzsche.* (*Zur Psychologie des neueren Individualismus.*) ROBERT SAITSCHICK. Berlin, E. Hofmann & Co., 1906. Pp. vi + 259.
- Französische Skeptiker: Voltaire; Mérimée; Renan.* (*Zur Psychologie des neueren Individualismus.*) ROBERT SAITSCHICK. Berlin, E. Hofmann & Co., 1906. Pp. vi + 304.
- The Time of Perception as a Measure of Differences in Sensations.* V. A. C. HENMON. (Arch. of Philos., Psychol. and Sci. Methods, ed. by J. McK. Cattell and F. J. E. Woodbridge.) New York, Science Press, 1906. Pp. 75.
- Annual Reports of the Department of the Interior, 1904. Commissioner of Education.* Vols. I., II. Washington, Govt. Printing Office, 1906. Pp. civ + 1176, vii + 1177-2480.
- Studies in Philosophy and Psychology.* A Commemorative Volume, by former students of CHARLES EDWARD GARMAN. Boston and New York, Houghton, Mifflin & Co.; Cambridge, Riverside Press, 1906. Pp. xxi + 411. \$2.50 net.
- Leib und Seele.* R. EISLER. Leipzig, Barth, 1906. Pp. 217. M. 4.40.
- Essay on the Creative Imagination.* TH. RIBOT. Trans. by A. H. N. BARON. Chicago, Open Court Publ. Co., 1906. Pp. xix + 390.
- Space and Geometry in the Light of Physiological, Psychological, and Physical Inquiry.* E. MACH. Trans. by T. J. McCORMACK. Chicago, Open Court Publ. Co., 1906. Pp. 148.
- Luis Vives y la filosofía del Renacimiento.* A. BONILLA Y SAN MARTIN. Madrid, Imp. del Asilo de Huérfanos, 1903. Pp. 817.
- Bibliografia Vichiana.* B. CROCE. (A bibliography of editions, translations, and MSS. of the works of G. VICO.) Naples, University Press, 1904. Pp. ix + 127.
- Two-Legs.* CARL EWALD. Trans. fr. Danish by A. T. DE MATOS. New York, Scribners, 1906. Pp. 148.

NOTES AND NEWS.

DR. EDOUARD ZELLER, the eminent writer on the history of philosophy, recently celebrated the seventieth anniversary of his doctorate.

DR. KUNO FISCHER has retired from the professorship of philosophy at Heidelberg University.

MR. CHARLES B. McMULLEN, A.M., has been appointed temporary assistant in the psychological laboratory at Princeton University, during his year's leave of absence from Tarkio University.

THE following is taken from the press :

MR. ROWLAND HAYNES, lately assistant in philosophy at Columbia University, has been appointed associate in philosophy at the University of Chicago for the ensuing year. He is to have courses in philosophy, ethics, psychology, and logic during the absence in Europe of Associate Professor A. W. Moore.

THE
PSYCHOLOGICAL BULLETIN

TENDENCIES IN CHILD AND EDUCATIONAL
PSYCHOLOGY.¹

BY PROFESSOR M. V. O'SHEA,
University of Wisconsin.

It is not an easy task in these days to keep abreast of the literature treating of various phases of the theory and practice of education. America appears to be more productive in this field than any foreign country, except Germany possibly. It is a common remark of English educationists that we are moving at a too lively pace over here in matters pedagogical, with the result that there is no stability in our educational theory. New conceptions of aims, values, and methods follow one another so rapidly that it is bewildering to conservative foreigners who endeavor to comprehend them all and adjust themselves thereto. In European countries one feels that educationists are devoting themselves mainly, though not entirely, to working out traditional educational doctrines in the most economical and effective way. They are not, to any marked extent, attacking the fundamentals of the historic educational régime. But in America there are men in most of the universities, in many of the normal schools, and in some of the administrative positions who are at least clearing the way for an attack upon a great variety of basal educational problems in the spirit of contemporary biological, sociological, and psychological thought. The belief is growing very strong among us that education can and ought to be treated as a phase of biological and psychological science, and this attitude is manifest in much of the current American literature on the theory of education and the principles of teaching. This attitude seems much more marked with us than anywhere in Europe, not excepting Germany; though German educationists have said to the writer that while America led in educational research a few years ago, still at the present

¹This number, dealing especially with child and educational psychology, has been prepared under the editorial care of Professor O'Shea.

time their country is ahead and will continue to lead in the future. But we may perhaps derive a little comfort from the fact that the Germans, many of them, know almost nothing about what we are doing, while a very large proportion of our men who are developing educational theory have studied German institutions and achievements at first hand.

It can hardly be questioned that in the study of the child Americans are more active than any other people. European psychologists and educationists are still quite commonly satisfied with the naïve, traditional view of the child-mind. Speaking generally, children are regarded as miniature adults, and it is not considered of importance to study them seriously according to scientific methods, though there are some notable exceptions in Germany, France, Italy, and England. But many of the psychologists in the universities and normal schools can not understand what 'child-study' in our country is all about; they do not yet see the need of paying any special attention to children, for whatever is peculiar about them may be apprehended by the operations of 'common sense.' But with us, development is now almost universally regarded by students of the subject as a process of continual transformation or even metamorphosis, rather than mere expansion; and educationists are convinced that they can not discover the thoughts, emotions, attitudes, and impulses of a boy of five, say, by simply turning their vision in upon themselves. The boy must be observed as a natural object in all his reactions; and he must also be subjected to special stimulations, so that his responses can be accurately determined. Most educationists among us are now students to some extent of children or of the theories of child development, and educational writing is to a constantly increasing degree reflecting the developmental attitude.

We have, of course, been passing through stormy times in the child-study movement, in respect of the criticisms made upon the methods of conducting the work. The outcome has been that there is less of the spectacular element in it now than there was a few years ago. Enthusiastic teachers are not quite so eager to announce the 'results' of their hasty excursions into the field of mental development. But the decline in pyrotechnical display does not indicate the termination of the movement by any means. On the contrary, so many persons are working quietly but conscientiously in the spirit of the movement that it has ceased to be a novelty, and it does not longer attract special attention. Then, educationists are settling down to their investigations in a serious way, and not striving for immediate generalizations, such as were easy to obtain when students made use mainly of

the 'syllabus' method. In the use of this method they could readily tabulate their returns, construct their curves, and proclaim their discoveries. There is some of this sort of thing yet, it is true, but no one pays much heed to it. It should be recognized, though, that the study of children has been carried on almost wholly by educationists, and teachers actually in service, and practical needs have exerted a marked influence upon investigation. Children were being trained, and very badly, too, people had come to feel; and the motive for studying them, always present with the investigator, was to discover better ways of handling them. Being a practitioner, the investigator could not divest himself of his peculiar views and his desires developed in his practical work. The teacher immersed in practical work cannot have a perfectly open mind; he must have some quite settled beliefs or he could not act at all. So the teacher-student of children made his little studies mainly, though always unconsciously, for the purpose of getting a respectable argument to support his practical attitudes.

But to-day the practitioners are not so active as they were, and men who are removed from the immediate necessities of practice are doing the work in the main. This is the case almost entirely in foreign countries, according to the observations of the writer. And we are coming to attach most importance to the observation of individual children for long periods, as Chamberlain¹ and Major,² for instance, have recently done, rather than to the study of large groups of children for brief periods, though so prominent a student as Thorndike³ makes use of the latter method altogether. We seem to be reaching a point where we realize that what is wanted is faithful records of the changes which take place with development in the attitudes and reactions of individuals under varied environmental conditions. These records can probably best be made by skilled observers who follow a child or a group of children for several years, taking account of developmental changes from day to day or week to week. Experiments upon children *en masse* cannot be of great service unless we have a good body of these individual records or life histories.

We are beginning to realize apparently that careful biographies of children in respect of a variety of activities, as, for instance, the æsthetic and the linguistic, to which the Germans have given most attention, will be of greatest service. Cross-sections of development in respect of any trait have little meaning except when we have the

¹ See his 'Studies of a Child,' reprinted from the *Pedagogical Seminary*.

² *First Steps in Mental Growth*.

³ See his *Educational Psychology*.

whole developmental process before us. There is no significance, for education at any rate, in an isolated fact of child-nature; we must know what preceded it in the causal series, and what it leads into. The books on child-development that have recently met with favor among educationists have endeavored to present the facts of development in their sequential and causal relations. It appears that the authors of these books have actually lived with the children they studied, so that they could observe minute developmental changes, and this is what promises to be of most service to education. A man who stays in his office and sends out his helpers to collect statistics can hardly treat mental development in a really satisfactory manner. It is a long and laborious business to keep a psychological record of a child or a group of children year after year; but in no less strenuous way can results be obtained of real value for either developmental psychology or education.

Turning now to educational psychology, it is apparent that the important current literature in America on educational theory and practice is written in the spirit of contemporary psychology, as expounded by such writers as James, Baldwin, Hall, and Dewey. The philosophical and logical modes of attack upon educational problems, still prominent abroad, are being rapidly abandoned here, although Professor Horne entitled his recent book *The Philosophy of Education*. But his treatment of the subject is rather from the standpoint of contemporary science than from that of philosophy. His point of view is quite different from that taken in Rosenkranz's *Philosophy of Education*, for instance, or a more recent German book, Natorp's *Allgemeine Pädagogik*, or a very late English book, Raymont's *Principles of Education*. As the philosophical attitude is being abandoned in our country, so is the logical in even a more complete manner. One would be surprised to see such a book brought out in America as Welton's *Logical Bases of Education*. We seem to be losing interest in all theorizing which is not based directly and very evidently upon a close study of educational processes at first hand, and in the light of current psychological conceptions. What I have in mind is illustrated very well in Bagley's *The Educative Process* and Thorndike's *Principles of Teaching*. In these books as types, one feels the psychologist working as a naturalist works, and handling in a concrete, vital way all the data of education within the field he attempts to cover. It is this study of the educational process as a phase of dynamic psychology that is coming to be characteristic of American educational activity.

A few years ago it was the popular thing for writers on educational theory to present at the outset a more or less formal system of psychology, and then make applications to teaching. Thus perception, for instance, would be treated in the fashion of the text-books on psychology, and then would follow some advice on 'Training the Senses.' Next memory would be discussed, and its education would be outlined; and so on through all the intellectual, affective, and volitional processes. A few of our educational writers still cling to this method of treatment, but it is doubtful if their books arouse much enthusiasm or gain many followers. Such work, it is coming to be felt, does not have the true ring; it is, in sum, *formal*. This sort of thing is still prominent in European books on 'Psychology Applied to Teaching,' but it can not endure much longer with us, except in the mechanical type of normal school, where nothing will be tolerated that is not perfectly systematized and formal and easily memorized.

There is a conviction developing among educationists that unless a teacher can have a good course in general psychology, so that he can push clear through the mere classificatory and definitional stage, and actually see his psychological principles illustrated in the activities of people about him — unless he can get into the attitude of the naturalist — he had best not study formal psychology at all. It will rather hinder than help him in dealing effectively with the people whom he must teach. Instead of observing their reactions and noticing how influences affect them, he will try rather to make everything fit into the formal schemes of his text-book. His definitions will stand between him and his students, so that his study will not make him at all more effective in dealing with any concrete psychological situation. Even if he learns verbatim all the 'Applications' in these books, he can never make out how they apply, assuming that they have worth, which is at least questionable in many cases. It is this belief which is turning educationists away from the applied psychologies, and inclining them to go straight to the school-room, and study in the psychological spirit the reactions of pupils upon various studies and methods.

Recently something of a stir was created among educationists by the appearance of Thorndike's *Educational Psychology*, for this promised to make the treatment of educational problems far more precise and definite than they had been treated previously. It was proposed to apply to all such problems the methods of exact science. Accurate quantitative measurement was to be substituted for the more or less skillful guess-work which was current in educational writings. Theoretically it would be possible by the employment of these exact

methods to develop a genuine science of education, whose propositions would have as high a degree of certainty, perhaps, as the principles of botany or zoölogy. In short, it was proposed to *measure* mental traits and changes as affected by educational processes, instead of simply estimating them. But it is significant that the author in his admirable *Principles of Teaching*, just published, abandons his exact methods almost entirely, and relies upon the method of observation of educational phenomena, and interpretation in view of current psychological conceptions of developing human nature. In the exercises he sets students he does not ask them to measure quantitatively the trait to be studied; he directs them rather to note carefully the reactions of pupils in reference to the particular matter designated, and to generalize the fact observed in this way, with principles of action already established. This point is mentioned here since it seems to show that we are not yet ready for a mathematical treatment of educational processes, even though this should be desirable, which is doubtful in the opinion of the writer. For purposes of practice, at any rate, the statistical handling of education leaves the student ill-equipped to deal with actual children, unless it be vitalized with much direct observation of pupils in their daily activities. And then the statistical method may appear to yield greater accuracy than it really does, for the statistics are not likely to cover all manifestations under all conditions of the trait studied. The most we can expect from this method is that it will supplement the method of observation of pupils continuously during a considerable period, so that traits may be followed some distance in their developmental career. In this way only can the really significant traits and changes in the pupils be observed, and the influence of educational agencies be appreciated.

We appear to be forsaking another mode of treating educational psychology which has been much in fashion during the past decade. A few years ago educational psychologies quite generally presented chapters on the nervous system as the basis of mental activity. It was thought the teacher would be helped to understand the reaction of the pupils under educative stimulation if he was made familiar with some of the leading principles of physiological psychology. However, it was not shown how these principles were to be taken into account in the teaching of any topic in the class-room, or in any matter of discipline. It is doubtful if the authors of these teacher's psychologies themselves saw the bearings of physiological psychology on teaching. They seldom had anything to say about school-room hygiene, so that as a matter of fact all the study of the nervous system was useless as

far as its value to the teacher in his special needs was concerned. We are seeing this to-day, and are beginning to leave neurology out of our educational books, except when it will help in some particular situation, as in understanding and dealing with abnormal mental manifestations, as in fatigue, etc.

School education stands most in need now of studies made according to the methods of contemporary psychology on the learning of the various subjects taught in the schools. A few years ago Dewey and McClellan published a monograph on the psychology of arithmetic, and since then a number of studies have appeared at home and abroad on the psychology of learning in general, and the psychology of language in particular, especially reading and spelling. But, all told, the work has been fragmentary and altogether incomplete. Many of the branches taught in the schools from the kindergarten through the university have not been touched at all by the psychologist. There is a vast work here for psychologists interested in the practical problems of education. They might do for teaching what the scientists in experiment stations do for agriculture. There is no reason why psychology should not aid in answering the question, How will the individual most economically and effectively make the adjustments which he is expected to make in his arithmetic, his geography, his grammar, and all the rest? Every university and normal school ought to have a staff of educational psychologists working on the practical problems of teaching the studies economically and effectively, so that teachers might get their methods from them instead of from the sources through which they are now supplied.

PSYCHOLOGICAL LITERATURE.

SCIENCE AND PHILOSOPHY OF EDUCATION.

- The Philosophy of Education.* HERMAN HARRELL HORNE. New York, Macmillan Co., 1904. Pp. xvii + 295.
- The Psychological Principles of Education.* HERMAN HARRELL HORNE. New York, Macmillan Co., 1906. Pp. xii + 293.
- The Principles of Teaching.* EDWARD LEE THORNDIKE. New York, A. G. Seiler, 1906. Pp. xii + 293.
- The Science of Education.* RICHARD GAUSE BOONE. New York, Scribners, 1904. Pp. xiii + 407.
- Dynamic Factors in Education.* M. V. O'SHEA. New York, Macmillan Co., 1906. Pp. xiii + 320.
- The Educative Process.* WILLIAM CHANDLER BAGLEY. New York, Macmillan Co., 1905. Pp. xix + 358.

Notwithstanding the contentions of some recent scholars that there is not and never can be a science of education, there is at the present time no more abundant field of activity in the academic world than that cultivated by those who evidently believe in such a science. Moreover, the literature being produced is commanding the attention of scholars and laymen to a remarkable degree. Barring certain sociological and economic questions there are none which find readier access to the popular magazines than those upon education. Many of these articles are written from a scientific point of view rather than from the purely popular. Educational principles are being sought from the realms of sociology, psychology, philosophy, physiology, biology and religion. The past biennium has witnessed a large output of decidedly valuable books along the newer lines of educational theory.

Professor Horne has given us two valuable books, the first an outline of the whole field of educational philosophy, and the second in the more limited field of the psychological principles of education. The first book is divided into five sections: 'The Biological Aspect of Education;' 'The Physiological Aspect of Education;' 'The Sociological Aspect of Education;' 'The Psychological Aspect of Education;' and 'The Philosophical Aspect of Education.' This book, though an outline, is not an elementary one and is unsuited as a

text-book for beginners, as I have found from a trial with a large class. It should be taken up by advanced students and regarded as a summary and a statement of generalizations after the whole field has been covered in a more concrete and elementary manner. Thus far no book has been published which meets just this need. Lectures and a search through the rich and voluminous literature must be the means of entering, until some one with patience and balance of mind will bring together the best that has been contributed and place it in interesting and usable form. Elementary students say that Dr. Horne's first two chapters on the biological and physiological aspects of education are the most easily comprehended. This is interesting, since in the preface Dr. Horne disclaims any authoritative knowledge of the fields of biology and physiology, but claims to be more at home in philosophy and psychology. It shows clearly how prone we all are to become abstract as we progress in knowledge and to assume as teachers that the elementary principles are possessed by beginners as well as by ourselves.

Dr. Horne correctly foresaw that his main contribution in this volume would be to "the definition of the conception of education . . . in a certain large and systematic unity, herein introduced into the hitherto unshapen notion of what education is and means in human experience; in the analysis of the spiritual environment of the pupil together with the attempt to vindicate on sociological and psychological grounds the equal right of æsthetic, with physical, intellectual, and moral education, as contained in chapters IV. and V.; and in the induction of the Kantian ideas of God, Freedom, and Immortality, from educational rather than ethical, facts, as presented in the final chapter."

As is the case in teaching all concepts, the concrete materials leading to the induction should precede the generalization, and as analysis should precede synthesis, so we may regard this book as an outline for the advanced student, one which will be helpful to the teacher as a handbook continually near by to point the way, to give poise and balance.

Dr. Horne's second book is a more elementary treatise and may well serve as an introductory work. The style is simple and is easily intelligible to junior and senior students in college classes and to advanced students in normal schools. The book is divided into five parts: The introduction deals with various sub-topics relating to the question of the meaning of the science of education. Part II. is entitled, 'Intellectual Education, or Educating the Mind to Know.' This part contains eight chapters, namely, Opening the Windows of Con-

sciousness; Educating the Mind to Perceive; The Educational Uses of the Apperceptive Processes; Aiding Memory; Educating the Imagination; Stimulating the Mind to Conceive; Training the Mind to Judge; and Teaching to Reason. Part III. is entitled 'Emotional Education, or Educating the Mind to Feel.' This part contains a description of the feelings and a discussion of the principles of emotional education. Part IV. is entitled, 'Moral Education, or Educating the Mind to Will.' As will be seen from the chapter headings in this part, he deviates from the old transcendental philosophy of the will and regards it from the genetic point of view. The chapters are, The Field of Will; The Use of Instincts in Educating; Training the Impulses; The Place of Imitation in Education; Educating by Suggestion; Forming Habits; Deliberating and Choosing; and Securing Attention. Part V. deals with the various questions relating to 'Religious Education, or Educating the Spirit in Man.'

Dr. Thorndike's book on *The Principles of Teaching* gives the same evidence of vigor, virility, and originality that characterize all his other writings. The book does not represent an absolutely logical system of pedagogical knowledge, such as some methodists might desire. It is far better, however, since the author has selected essential principles which every teacher ought to understand and which need to be taught because not self-evident. Platitudes which might have given the book a systematic appearance have been omitted and the space occupied by things in which teachers need instruction.

Although very positive in style, the appearance of dogmatism has been happily avoided by the introduction of much concrete material and experimental evidence. The book is largely written upon the inductive plan, and many of the generalizations which the author desires to impress thoroughly are not directly stated, but the student is led to them by the questions asked and exercises given for observation and experimentation. In his preface he appropriately says that "Scientific principles are the back-bone of knowledge of teaching but concrete exercises are its flesh and blood. For the work of the student of teaching is to get practical control of principles by using them. The author offers no excuse for using over a third of his pages for such exercises: indeed, they should occupy more than two thirds of the student's time." Dr. Thorndike has drawn very largely from the results of his own investigations for the facts upon which he bases his conclusions. Many of the conclusions stated in his *Educational Psychology* are here put in more usable form for beginners. Dr. Thorndike is doing much to disprove the assertions that there is no science

of education and that psychology has nothing practical to offer to the teacher. He not only believes in education as a qualitative science but is proceeding more swiftly than some can keep up with that it also has a quantitative aspect. It may be difficult to prove that we may "measure ability to add or to spell or to translate Latin or to discriminate colors as accurately though by no means as easily as we can height or weight." (Thorndike, *Educational Psychology*, p. 4.) But work such as Dr. Thorndike is doing will help to demonstrate rapidly that educational science may be as easily quantified as much of biological science, geological science, or even physical science. It is easy to forget that all sciences are much more qualitative than quantitative. Take away the qualitative aspect and most of that which makes sciences interesting disappears.

After briefly discussing The Teacher's Problem, and Psychology and the Art of Teaching, he discusses in a very helpful manner the subject of Physical Education. Dr. Thorndike has called attention in a striking way to the absolute necessity of a better recognition of native difference among children and of adjusting school work to fit individual needs and capacities. He says (p. 71), "The amount of differences actually found in children of the same age or in children in the same school grade is greater than teachers perhaps realize. The range of ability in school children of the same age is such that in a majority of capacities the most gifted child will, in comparison with the least gifted child of the same age, do over six times as much in the same time or do the same amount with less than a sixth as many errors."

The chapters in which Professor Thorndike has given the most original contributions perhaps are: Instincts and Capacities, and closely correlated with it the ones on Individual Differences; Motor Expression; Motor Education and Formal Discipline. There are chapters on Apperception; Interests; Attention; Principles of Association; Principles of Analysis; Reasoning; Responses of Conduct; Moral Training; Responses of Feeling; and The Scientific Study of Teaching.

Professor O'Shea's book on *Dynamic Factors in Education* is a treatise upon a special phase of educational science rather than a general outline of the whole subject. It is admirably suited to be a hand-book for advanced classes, who desire to pursue special topics exhaustively, by first reading a guide-book and then following up the literature of the subject. The ample references and well-selected bibliography make it well suited to this. The style is so clear and the treatment so concrete and inductive that the general reader will understand most of

it. Beginners in educational courses would not have special difficulty in understanding the discussions, and it would be a good text for the last third of a first year's work in the principles of education. Professor O'Shea modestly states that "Many, perhaps most, of the principles presented in this volume are, I think, becoming familiar to students of mental development." He rightly observes further that these principles 'are still very hazy, to say the least, in the minds of the majority of those who are charged with the immediate care and culture of the young.' These principles are, however, undreamed of by the rank and file of teachers, and still less are they known to parents, who really determine what manner of men and women their children shall be.

The chapter headings indicate very well the general plan and scope of the book. They are as follows: The Development of Inhibition; Dynamic Education; The Dynamic Aspect of School Studies; Manual Activities in Education; The Method of Acquiring Adaptive Activities; The Method of Acquiring Imitative Activities; The Teaching of Schoolroom Arts; Development of Coördinated Activities; From Fundamental to Accessory; The Energetic Factor in Education; The Influence of Fatigue on the Efficiency of Mind and Body; Economy in the Expenditure of Energy; The Effect of Æsthetic Influences upon Mental Tension; Some Common Wasteful Practices (including a consideration of fine work, poor pens, unhygienic writing, overstimulation, the teased child, etc.); The Eyes in Relation to Nervous Waste.

Although the above topics are understood by specialists, Professor O'Shea has made a real contribution by sifting out the important principles from a mass of undigested materials in the periodical literature, placing these in concrete, usable form, and adding a wealth of illustrative matter from observations and experiments of his own. Inasmuch as one of the principal reasons why there has been such slowness in acknowledging a science of education is that the relation between perfectly obvious psychological and biological laws and education has not been seen, one of Professor O'Shea's chief contributions is in selecting those laws and phenomena that have an educational application and clearly showing the application.

Dr. Boone's *Science of Education* is a book for mature students rather than for beginners in educational theory. Persons who have taken preliminary courses with abundant concrete material will find this an admirable generalization of the ideas which should have been developed inductively. The book is a splendid epitome of Dr.

Boone's oral presentation which abounds with a wealth of concrete illustration drawn from a long and varied experience in educational work. The volume is an interpretation of the meaning and problems of education rather than a discussion of methods of approach to practical problems. It is more concerned with the *what* of education than the *how*. This book in reality represents one phase of the science of education instead of the whole realm. Very little attention is devoted to the biological, neurological and physiological phases, questions which have justly been emphasized by Thorndike, Horne, Halleck, and O'Shea. Dr. Boone's main discussion is upon the social phase of education. To give a certain symmetry the other questions are included, but not at all fully. In this volume the whole process of education is treated largely as a social question.

The book is written in a style which again exemplifies Dr. Boone's splendid power in using the English language beautifully and effectively. Like his oral presentation of any subject, the language which he employs possesses a charm never to be forgotten by those who gain his acquaintance.

Dr. Bagley, in *The Educative Process*, has produced a book which, as stated in the preface, is intended to present a systematic and comprehensive view of the task that is to be accomplished by the school. It covers the field commonly included under the terms General Method, Method of the Recitation, Theory and Practice, etc.; but it deals with principles rather than with the details of device and 'method.'

Dr. Bagley has written a very readable book. The topics discussed are treated in a thoroughly scientific manner and will form a valuable addition to the literature of these topics. The principles enunciated do not represent new discoveries, but the treatment is fresh, vigorous and independent. The contribution in this book lies in the careful selection of biological and psychological principles which have educational bearings, and which can be seen as such by the average teacher. Sufficient conservatism has been shown in the selection of data from other sciences. Dr. Bagley states that care was taken 'to utilize only those data of psychology and biology that are vouched for by reputable modern authorities in these fields.'

The question arises whether there is not a variance between the assumed scope as stated in the preface and the book itself. The title is more suggestive of the contents than is the preface and more so than many of the publishers' notices have been. Judging by the classification made in the recent deliberations of the Society of College Teachers

of Education, fully half of the work belongs to the principles of education and educational psychology, rather than to method. The title also bears out this comment. An enumeration of the chapter headings shows that most of the work represents the fields above indicated. The chapters are as follows: Education Reduced to its Lowest Terms (in which he discusses instincts, reflexes, heredity, transmission of acquired characters, meaning of education, etc.); The Function of the School; The Ethical End of Education; The Reading of Meaning into Sense Impressions or Apperception; The Needs of the Organism as Determining Apperception or Degrees of Apperception and Apperceptive Systems; Attention, Interest and Will in the Light of Apperception; Experience Functioning as Habit; Experience Functioning as Judgment; The Condensation of Experiences and the Formation of Concepts; The Organization of Experiences through Conceptual Judgments; The Factors of Efficient Recall; The Functioning of the Factors of Recall as Modified by the Periods of Child Development; Formal versus Intrinsic Values of Experience and the Doctrines of Formal Discipline; The Development of Ideals as the Chief Work of Education; The Intrinsic Value of Different Types of Experience; The Transmission of Experience in the Concrete or Imitation and Objective Teaching; The Transmission of Condensed Experience or Development and Instruction; The Media of Instruction; The Inductive Development Lesson; The Deductive Development Lesson; The Study and the Recitation Lesson; The Drill, the Review, the Examination Lesson; The Hygiene of the Educative Process.

The above list of books represents the science, philosophy, or principles of education, whichever, I believe, one may choose to term it. The books deal with principles rather than devices, with the theory rather than the practice of education, and with scientific knowledge of the child rather than with subjects of instruction. There has been great need of scientific work in this direction, and education can never be upon a firm foundation until it rests upon scientific laws and principles rather than upon tradition. The foregoing group, no doubt, is an earnest of what will appear in the near future. These books are not final, but a highly creditable contribution to the elements of the subject.

We should, of course, include in the list of important educational books of the biennium, Hall's monumental work on *Adolescence*, Cubberly's work on *School Funds and Their Apportionment*, Monroe's splendid *Text Book in the History of Education*, Dexter's *History*

of *Education in the United States*, Brumbaugh's *Making of a Teacher*, the *Reports of the Commissioner of Education*, and the *Proceedings of the National Educational Association*. Taken collectively, the list of books on education produced during the last bien-nium in America alone, will certainly compare favorably in quantity and quality with the publications in any other field of thought.

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SOME RECENT CHILD-STUDY AND EDUCATIONAL LITERATURE IN PORTUGUESE, SPANISH AND ITALIAN.

I. PORTUGUESE. — A notable educational contribution is Bernardino Machado's *A Universidade de Coimbra* (Coimbra, 1905, pp. 233), dedicated to 'the academic youth' of Portugal. The author is professor of anthropology in the University of Coimbra and has been minister of education and agriculture. He has also published an interesting child-study monograph, *As creanças; Notas d'um pae* (A Father's Notes on Children), which saw its second edition in 1904, besides several volumes on educational topics, 1898-1904. The volume now under review contains academic discourses, graduation and other addresses to the student body, etc., and abstracts of six lectures on pedagogy delivered in the University of Coimbra in January-March, 1900. The reading of the material here presented must surely convince anyone that Portugal, with its historic University, is not dead educationally, but very much alive.

The key-notes of Professor Machado's pedagogical lectures may be given in the following sentences: Teaching is a social function, a work of dedication and sacrifice. A bad citizen and a good teacher are incompatible. Teaching is socialization. Man is to be educated for sociability, for coöperation, for virtue, not for struggle; for a condition of peace, not for a state of war. Education through science is part of the great work of social organization characteristic of the modern era. Ideal education and ideal government are one and the same. There is an attraction of souls in the moral world of to-day like the physical attraction of gravitation in the material realm. Patriotism is doubtless a right, but internationalism is at the same time a duty. There is no school within the four walls of a room. School

is family, society. Education can never be imprisoned. An admirable instance of social dedication is seen in the movement for 'university extension.' In the volume is included the remarkable address, 'A Universidade e a Nação' (University and Nation), delivered as an Inaugural at the beginning of the academic year 1904-1905, which may indeed take rank with any similar pronouncement of recent years in the old or the new world. It is an able and eloquent plea for the university as a democratic laboratory, where the highest place, at some period, falls to each, where ideas are created, not merely consumed. If the university is isolated socially and politically it is dwarfed, narrowed and limited in its usefulness for humanity. Divorce of the scholar and the citizen makes less of both. Their greatest strength lies in unity in the same individual.

Another interesting Portuguese work is Dr. F. Adolpho Coelho's extensive monograph, *Exercícios corporaes e desenvolviment physico* (Bodily Exercises and Moral Development), the first section of which is published in the *Boletim da Direcção Geral da Instrucção Publica* (Lisbon, 1905, Vol. IV., pp. 369-440). The author is professor of Romance philology and pedagogy in the Higher Literary Course, and also a folklorist of distinction. The first part, which is historical and critical, will treat of doctrines and facts. The second, theoretical part, will consider the relations between health of body and health of mind, movement and will, the moral will, conclusions. To judge from the first section of the first part, dealing with the history of the subject, Professor Coelho's monograph will be perhaps more extensive in scope than any existing work on this important topic. A list of writers, etc., considered will indicate this: Plato, Aristotle, Quintilian, Seneca, the Portuguese king Duarte, Paolo Vergerio (the Italian humanist, author of *De ingenuis moribus*, 1402-1404), Vives, Montaigne, Locke, Rousseau, Kant, Pestalozzi, Gutsuths, Jahn, Ling, Amoros (author of a *Manuel complet d'éducation physique, gymnastique et morale*, (1848), Schleiermacher, Christian Palmer (author of *Pedagogia evangelica*, 1852), Dr. A. Sargent, Delsarte, Herbert Spencer, Herbart, Hermann Schiller and Otto Willmann, T. Ziegler, O. Gréard, H. Marion, J. Payot, F. Thomas, P. Tissié, H. Wickenhagen, the Dominican Père Didon, Konrad Koch, F. A. Schmidt, G. Demeny, Pierre de Coubertin, etc., etc.,—the author's reading is wide enough to include Gulick's article in the *Popular Science Monthly* for 1898. The contributions of Portugal to the literature of physical education are very interesting. Professor Coelho calls attention to the fact that in the years 1790 and 1791 appeared two books with the same title,

Tratado de educação physica dos meninos, the first by Francisco de Mello Franco, the other by Francisco José d'Almeida. In 1872 a professor of the Lyceum of Evora, since then of Coimbra, published a volume on *Erros e preconceitos da educação physica*. A notable Portuguese work is the *Ensinaça de bem cavalgar* (Training the Good Cavalier) by king Duarte, who was also the author of the *Leal Conselheiro*, at the close of the fifteenth century.

II. SPANISH.—The article of Professor P. Dorado, of the University of Salamanca, on 'Educación coreccional' (*Bol. Inst. Libre Enseñ.*, Madrid, 1905, LXXIX., pp. 257-264) consists of two chapters from his recent book, *Nuevos derroteros del derecho penal*, which treats of the new methods of dealing with youthful delinquents—the educational, protective and correctional (not retributive or punitive) idea has replaced the older criminal legal processes. Children's courts, special schools, opportunities for play and recreation, chance and occasion to be as other children and youth, the things that make for growth, health and the love of life and its normal activities. C. Bernaldo de Quiros, *Criminalogia de los delitos de sangre en España* (Madrid, 1906; pp. 130), highly praised by Havelock Ellis, is interesting, as sharing in the evident reaction against the neglect of education as a factor in the diminution of crime. While it is certain that the saying, 'open a school, close a jail,' has been made to signify too much in matters criminological, the reaction against it has gone too far in some quarters. The most criminal region in Spain is Logroño, which, as Havelock Ellis (*J. of Ment. Sci.*, 1906, p. 591) has pointed out, is the center of the great Riojan wine-district, a fact that may have some significance. It may also be significant that the least criminal parts of the country as studied by the author are the Balearic Isles, Orense (adjoining the north of Portugal), and Basque Guipuzcoa. In some other things, too, the somewhat primitive Basques have a good reputation.

At the reorganized University of Havana in Cuba is published the *Revista de la Facultad de Letras y Ciencias* (Vols. I.-II., 1905-1906), three numbers yearly. Considerable space is occupied by articles relating to Cervantes and *Don Quixote*, in connection with the three hundredth anniversary of the appearance of that famous book, and by an account of the schools of St. Louis (Mo.), resulting from the World's Fair; by anthropological and historical articles, etc. There are articles on school-houses by Dr. J. M. Dihigo, 'Informe sobre fabricación de casas escuelas' (Vol. II., pp. 221-237), and Dr. A. Castellà, 'La mansion escolar en Cuba; Necesidad y medios de

mejorar su condición actual' (Vol. II., pp. 238-252). In an article on 'Las modificaciones del actual sistema de Enseñanza' (Vol. II., pp. 282-293), Dr. A. Rosell, who holds that 'the teacher is the chief support of democratic governments,' advocates improvement of conditions, establishment of normal schools, and 'vacation schools' for teachers, and the reorganization of education somewhat after the manner of the recent changes at the University of Paris.

The newly-established *Archivos de Pedagogía y Ciencias afines*, of which the first number is dated June, 1906, is the organ of the Pedagogical Section of the Faculty of Juridical and Social Sciences of the National University of La Plata, in the Argentine Republic. The editor is V. Mercante, who contributes an article on 'Investigaciones craneométricas en los establecimientos nacionales de La Plata' (Vol. I., pp. 41-79), in which are given details of the head measurements of 652 boys and 549 girls between 6 and 20 years of age, pupils in the National College, the Normal School and the Graded Annexed School, of nationalities (in one school the parentage of the pupils included Spanish, Italian, Oriental, French, Belgian, Russian, Greek, English, Swiss, German, Portuguese, Brazilian, American Indian, Argentine) corresponding to the very mixed condition of the population. The dominant type is the brachycephalic and mesocephalic; both cranial diameters grow from 7 to 18 years, but in different proportions: females are more brachycephalic than males; the cephalic indexes range all the way from 70 to 92. These data are a welcome addition to the material of an anthropometric nature from Spanish America. In an article on 'La intensidad de las percepciones en los niños' (pp. 80-91), R. Senet, professor of anthropology in the Pedagogical Section of the University, discusses the gustative, olfactive, muscular, tactile, thermic, ocular perceptions of children, and their differences from those of adults, and seeks to explain the greater intensity of the former by the fact that in the child and the adult the same number of peripheral elements exist, and, neoformation of nervous elements being ruled out, the receptive periphery of the child is less than that of the adult, and with equality of stimuli from without a larger number of elements are excited in the child, more intense sensations, and, as a result, perceptions in accordance with these sensations. In a brief article (pp. 107-108), Professor J. Ingegnerios discusses the 'Psicología del éxito' (Psychology of success): "Glory is the alcohol of the elect; the first time it intoxicates, thereafter it becomes an absolute necessity." It has many forms but all are the same in effect: the word of an esteemed teacher, the applause of the crowd, the conquest of a beautiful woman. It is the

best lubricant for the heart. It exalts, hypertrophies personality. But slow science is not yet able to assure this potent drug to all, not even to the man of genius, whom it might often cure of his many ills. In a circular letter to his colleagues on 'Promoción universitaria y exámenes' (pp. 109-111) Dr. R. Rivarola, Dean of the Faculty of Juridical and Social Sciences, notes 'the discredit into which examinations as a test of ability have fallen in all grades of education,' and proposes the abolition of such as may be made within the law. Professor Mercante, the editor of this journal, is also the author of a previous volume, *Psicología de la aptitud matemática del niño* (Buenos Aires, 1904; pp. xii, 391), containing the results of an immense mass of painstaking experiments and other data concerning the mathematical abilities of school children. A second section of this extensive work, *Enseñanza de la aritmética* (pp. iv, 726), appeared in 1905. In the number of the *Archivos de Psiquiatria y Criminalogia* (Buenos Aires) for February, 1906, Professor Mercante has an article on 'Sentimientos estéticos del niño,' in which he gives the results of his investigations of the feelings for form, size and color among 280 children (both sexes) between 7 and 15 years of age. Among the conclusions reached are these: The esthetic feeling of woman is fluctuating and dispersive, that of man fixed and concentrated—a woman, by virtue of her dispersive affectivity (not her analytical power), is sensible to all beauties, objective and occult, physical, mental, and moral; she admires the new and the rare, the common and the trivial. The favorite color of girls is red, of boys green. Children prefer the small to the large. Forms and colors orient feelings better than size and position. Regularity and symmetry do not always fascinate. Age, and study, in the primary cycle do not determine elemental esthetic tendencies, principles of variation, etc.

III. ITALIAN.—The newly-established *Rivista di Psicologia applicata alla Pedagogia ed alla Psicopatologia*, published in Bologna by Professor G. C. Ferrari, the head of the Emilian Medico-Pedagogical Institute (Bertaglia), and now in its second year, contains many articles of interest here. Professor Ferrari himself discusses: 'Mentalità e senso morale' (Mentality and moral sense, Vol. I., pp. 4-6); 'Pregiudizî dell'educazione' (Prejudices of education, pp. 69-73: "Defectives are now not seldom better taken care of in body and mind than are normal children; they are attended by specialists, have their labor and studies suited to their needs and capacities; innumerable normal pupils still wait for this"); 'L'istruzione dei deficienti' (Instruction of defectives, pp. 305-315: "For true defectives scholastic

instruction is *per se* useless; the medico-pedagogical institution is the most important aid"); 'Per una scienza psico-giudiciaria' (Need of a psycho-judiciary science, Vol. II., 1906, pp. 1-12: there is need not only for the 'Psychologie der Aussage' of Stern, etc., but also for the equipment of judges and magistrates with psychological knowledge, not merely for the sake of children, but for that of adults as well); 'L'educazione dell'incosciente' (Education of the unconscious, pp. 73-76: "The importance of the unconscious in the history of the race justifies its cultivation in the education of the individual: the immensity of automatic and sub-conscious life must not be let run to waste"); 'I traumi sessuali nei fanciulli' (Sexual traumas in children, pp. 90-98: human normal individuality is not a unity, but an aggregate, there being possible as many personalities as there are groups of feelings that determine conduct; at a certain age one of the most important of these, the sexual personality, develops; experience shows that exaggerated sexuality is more easily had than perverted; these personalities tend to be precociously mature). Miss V. Lamieri has an interesting article on 'Folk-lore e pedagogia' (Vol. I., pp. 26-31), in which are given briefly the results of experiments with 'proverb-plays' among the defectives of the Emilian Institute. The effect upon mental activity, memory, vocabulary, conversation, etc., has been excellent. The 'passion for proverbs' has 'wrought a revolution' in their lives. In another article (pp. 99-103) she discusses 'I giuochi delle bambine deficienti,' resuming the results of observations on defective girls at the Emilian Institute. The plays of these children show little variety and are simply products of imitation, being neither the result of the accumulation of energy, nor preparation for the serious acts of adult life (the theories applicable to normal children do not apply here). A third article by Miss Lamieri (Vol. II., pp. 107-115) treats of 'Manifestazioni poetiche in una deficiente,' specimens being given of the poetical effusions of a 14-year old girl in the Institute, the products of her periods of greater exuberance of life, robuster feeling of health, greater moral serenity, and general increase of energy—a contrast to the fits of verse-making in normal girls in the poetic mysticism of adolescence and soft periods of sentimentalism and spleen. The further study of this case will be of interest. In his article (Vol. I., pp. 19-25) on 'Psicologia ad uso dei riformatorii,' Professor C. Colucci, of the University of Naples, argues for the separation of asthenics from hyperasthenics, and the instituting of a 'pedagogic gymnastics,' adapted, like manual labor, to individual and industrial ends. In a brief discussion of 'Nostalgia' (Vol. I., pp. 74-82)—the subject is to be treated

by the author in a monograph elsewhere—A. Renda points out the affinities of this affection with melancholia. In a brief article (pp. 83–89), ‘Sull’arte d’interrogare,’ Professor G. Vailanti, of the Technical Institute in Florence, who is well informed with the writings of Professor William James, discusses the need for an art of questioning that will involve the effective acquisition of new ideas and new knowledge, and not the mnemonics of verbal formulæ, mere phrases, etc. Giuseppe Pennazza’s articles, ‘L’insegnamento oggettivo pei deficienti’ (Vol. I, pp. 103–106), and ‘Osservazioni sulle preferenze sensoriali elementari nei fanciulli deficienti e nei normali’ (pp. 348–353), are based on experiments at the Emilian Institute. The first gives the results of experiments with pictures drawn by the teacher, to be explained by the pupils and recalled by memory; the ability shown in this was surprising. The second résumés the results of experiments on the elementary sense-preferences (smell, touch, taste, sight, hearing) of 160 male (normal 80, abnormal 80) pupils and 96 female (normal 48, abnormal 48) from the Bologna schools and the Emilian Institute. In general, there is no great difference in preferences between the normal and the abnormal pupils. The least homogeneous senses (more so in the abnormals) were hearing and sight; touch seems more evolved in the normals, hearing less differentiated in normal girls; normal male preference for green and abnormal female for square form are noted.

U. Loreta’s ‘Contributo allo studio del senso estetico nel fanciullo’ (Vol. II., pp. 216–250, with colored plate) records observations on the author’s 7-year old boy. Up to 6 his artistic manifestations consisted of the usual childish efforts, but when 7 he produced a landscape made with colored crayons, exhibiting unusual care in proportions and harmony of tints. He was then given color material, and in three months more than 100 of his drawings (for the greater part mountain landscapes—the boy lives in the country), made spontaneously and showing a certain sense for landscape, etc., were obtained. The boy did not go to school, and imitation of companions is likewise excluded, so the case is indeed a notable one. In another brief article, ‘Sullo svolgimento del senso estetico nel fanciullo’ (Vol. II., pp. 115–118), Loreta reports further concerning the young artist. In the eight months since the first publication his productions have become fewer and less accurate (he has begun to go to school and has had less leisure, for one reason). Loreta still refuses to see in his child any special aptitude and awaits the further development of the instinct for drawing. Professor F. del Greco, of the University of Naples, in an article on ‘La

psicologia del carattere e i contributi delle ricerche psichiatriche' (Vol. I., pp. 251-263), distinguishes the two poles of human individuality: 'temperament,' which indicates the prevalent tone of the vital feeling of an individual, and 'character,' which is his 'practical individuality' (himself as he works among his own fellow-beings). Temperament turns on incommunicable sentiment-life, character on life of will and action. The value of psycho-pathological observations is pointed out. The article of Professor Giuseppina Fumagalli, of Brescia, on 'Il senso della vita nell'educazione dell'infanzia' (Vol. I., pp. 277-284) emphasizes the importance of 'the sense of life' in the history of the race and in the development of the individual. Italy has a people '*par excellence* atavic,' who in large measure preserve still the equilibrated and practical 'sense of life' which was the salient character and the glory of the Roman world. This sense of life must be educated, and with it developed the intelligence that will restore the nobility of the old Roman. E. Morpurgo's article on 'Il suicidio nei minorenni' (Vol. I., pp. 335-344), besides a general discussion of other data, treats particularly 25 cases of attempted and successful suicide in young men and women under 18, occurring in the first quarter of 1905. The causes were as follows: failure at examinations, 1; parental reproof, 3; troubles of love and friendship, 9; *indifferentia vite*, 3; mental alienation, 2; uncertain, 7. Seven cases were 16 years of age or under, three being below 14. The prophylaxis for suicide lies in rendering healthier the family environment, seeking to develop rationally the moral energies of the individual from the beginning, and in diffusing a knowledge of the danger and the advantages of puberty, etc. In a brief discussion of 'Il fascino della criminalità' (Vol. II., pp. 220-225), M. U. Masini points out the existence in more or less marked fashion, according to the stage of intellect and society, of a 'fascination of criminality,' characteristically seen in woman, for whom crime constitutes one of the most notable elements of the sexual lure; her patronage of cruelties such as bull-fights, etc.; also indicates how 'the association between the sexual function and brutality and ferocity in the past of the race still exerts a powerful influence over her.' The 'fascination' exists in man also, as the history of great criminals and their sway over 'the soul of the crowd' indicates.

In an article entitled 'Forme poco comuni di paramnesia in due giovanetti' (Vol. I., pp. 398-409) A. Lemaitre describes a case involving not the expression of 'the already heard,' but of 'the already articulated (*già-articolato*)' in a 13-year old boy, and a case of 'paramnesia with

reversed images' in another youth of like age, both healthy, sane, and above the average in intelligence. The former has photisms for the vowels, the latter a month-diagram, reversed images in dreams, etc. Dr. G. Bellei's 'Ulteriore contributo allo studio della fatica mentale nei bambini delle pubbliche scuole' (Vol. II., pp. 22-27) compares results obtained in 1900 with those of 1905, the conclusion reached on the first occasion being clearly confirmed, viz., that "owing to the great mental fatigue produced by it, the work of the pupils during the afternoon lessons is not only without advantage in their education, but is even dangerous to their health." In his discussion of "La cultura pedagogica e l'istituzione di un 'Paedagogium' nazionale," Alessandra Gariboldi (Vol. III., pp. 28-34) advocates the institution of a 'national Pedagogium,' whose scientific function should be that of research, the collection of pedagogical and psychological facts, etc.; not a mere museum, however, but a place vivified continually by the constant labor of analysis and synthesis. Attached to it should be 'a rational school for the teaching of corrective pedagogy,' the result of medical, psychiatric, and psychological science. A proposal for a 'national Pedagogium' was presented to the Italian government in 1903 by Dr. Ugo Pizzoli. In his article on 'Gli effetti del riso e le loro applicazioni pedagogiche' (Vol. II., pp. 85-91), R. G. Assagioli looks forward to the utilization in teaching some of the phenomena having to do with laughter. One important pedagogic value of laughter is 'strong, sure and lively stimulation of attention'; another, its power to make understood and remembered things taught. The contagion and suggestivity of laughter and related phenomena are of pedagogical import. Carlo Soresi's article (pp. 100-105), 'Dei giocotoli per bambini,' is based on observations of the use of playthings by three children between 3 and 7 years of age. The conclusions of the author are, that toys should be made for children not for adults — fine mechanisms, beautiful models, etc., avail the child nothing. Play ought to be, above all, mirthful and joyous, and we ought not so early to begin to compel the child and impose upon him with toys made with the pretense of educating him, teaching him duty, and the like. In an article on 'L'onanismo precoce nei ragazzi e la sua cura psichica' (Vol. II., pp. 138-159) Professor A. Lemaitre, of Geneva, distinguishes a 'precocious' type (commencing before puberty), from that which occurs after puberty. The psychic test employed by the author (enfeeblement of topographic memory with preservation of the mathematical faculties) would not hold so well after puberty. Professor Lemaitre advocates a 'psychic cure,' with conversations *in loco paren-*

tis, gentle and natural—the most successful argument emphasizes the ‘dirty’ nature of the vice. In an interesting article on ‘Il sentimento religioso nei fanciulli del popolo’ (pp. 167–178), A. Pellottieri gives the results of his investigations among pupils of the elementary schools and the kindergarten (girls and boys) in various Italian cities and towns, little communes, etc., as to their religious feelings and ideas. The general conclusion reached is that, “in the child, if religious ideas exist, they are inactive, little indued with feeling, and without social import.” Among the points noted by the author are these: Children have a myopic sense of the creation, not a sense of wonder at it; God *made* the world, that is all. Fear of God is often rather of the kind entertained toward some ‘monstrous’ figure. Respect for the church and its sacred milieu vanishes with the child-crowd. The feeling of worship is already less in boys than in girls. Such faith in the protection of a supernatural power as exists is rather one side of the optimism of childhood. S. Ottolenghi’s article on ‘L’algeometria nella scuola’ (pp. 179–186) gives algesometric data concerning the five best behaved and most intelligent, the five worst behaved and five most backward pupils from one of the public schools in the city of Rome. The pain sensibility is highest developed in the most intelligent and best-behaved pupils, and most deficient in the backward. The reaction to pain is prompt with the well-behaved and intelligent and bad-behaved pupils, slow with the backward. Under the title ‘Un piccolo poeta’ (pp. 268–270), P. Lombroso publishes two little poems (one made in five minutes) by an 11-year old son of Ysaie, the eminent violinist and composer. The poems are in French, one called *Pour mère* the other *Sur moi-même*. A certain spirit of *jocoserie* and jesting pervades them both. Interesting is a discussion on fables for children. In a letter to the editor (Vol. I., pp. 292–296), Paola Lombroso Carrara replies to a request made in his article ‘Credo quia absurdum’ (pp. 129–134), giving reason for her belief in the use of fables, etc., for children. The right children have to them is the same right adolescents have to poetry and adults to science. They correspond to human needs and demands that are instinctive and intuitive. The reality or realizability of ‘fables’ appeals to children. They have not the exciting and nocuous character which, with others, Ferrari would attribute to them. In a brief reply, ‘Le favole pericolose’ (pp. 353–354), Ferrari points out that fables may not harm perfectly normal children with ideal homes, parents, nurses, etc., but with others the case is different. The discussion is continued by Dr. Carlo Soresi in a brief article, ‘Contro le fiabe’ (Vol. II., pp. 51–53), in which the author emphasizes the

fantastic and harmful excitation due to fables with children. The fable-listening child is in the condition of an ecstatic, and this is dangerous. Little children need rather play and movement.

A valuable contribution to Italian child-study is Professor Maria Montessori's monograph on the 'Caratteri fisici delle giovani donne del Lazio' (*Atti della Soc. Rom. di Antrop.*, 1906, XII., 37-120) in which are given details of the observation of the physical characters (anthropometric) of 200 young women between the ages of twenty and thirty years from the region known as Lazium, the country about historic Rome. Two types of women, (one long-headed, low-statured, brunet; the other broad-headed, tall blond) differing in numerous somatic characters, from stature to microscopic section of the hair, are distinguished. Here may be mentioned also the same author's previous study, 'Sui caratteri antropometrici in relazione alle gerarchie intellettuali dei fanciulli nelle scuole' (*Arch. p. l'Antrop.*, 1904, XXXIV., 243-297), based upon the study of 105 pupils of the Roman elementary schools—in which the conclusion was reached that the well-to-do and intelligent showed better development of the head, etc. A. Zuccarelli's *Osservazioni intorno alla frequenza di dati degenerativi somatici in rapporto con la condotta, in alunni di scuole secondarie di Napoli* (Naples, 1905, pp. 33) deals with degenerative stigmata in relation to conduct in the cases of one hundred individuals between twelve and eighteen years of age in the Istituto Nautico e Scuola Tecnica in Naples. A smaller proportion of degenerative marks than reported by earlier investigators was found. Of M. Pasquale's valuable study of 'Lo sviluppo fisico nei ragazzi delle scuole della Città e Provincia di Roma,' published in the *Internationales Archiv für Schul-hygiene* (1906, II., 270-297), a brief abstract in French is given in that journal, as also of Dr. G. Badaloni's study on 'La scrittura dritta e la scrittura inglese; Influenza della scrittura sulla funzione del respiro' (*Ibid.*, 227-265). Pasquale's investigations deal with 3,535 children (boys 2,005, girls 1,530) between six and fifteen years. The sex differences are noteworthy and reach their maximum as to stature between ten and fifteen. The influence upon physical development of food, habitation, work, clothing, education, are pointed out, and in particular the profession of parents. Dr. Badaloni's experiments, carried on from June, 1904, to January, 1905, lead to the conclusion that the 'English (slant) script' ought to be abandoned in favor of the straight (upright) script, the former having evil effects on respiration, etc.

Among interesting and valuable books and pamphlets may be briefly mentioned the following: M. Calcagno's *Note di psico-fisiologia*

infantile e considerazioni pedagogico-didattiche fatti sugli alunni di una prima classe elementare (Rome, 1905) is worthy of note as a psycho-physiological *aperçu* of every one of 44 elementary pupils, carefully and scientifically obtained and recorded by a teacher in the primary schools, and as a useful addition to the literature of school-life, school-atmosphere, etc. U. Loreta's *Alcune note di Pedagogia* (Bologna, 1905) treats of activity, physical education, attention, curiosity, memory, imagination, feelings, intelligence, will, religious education, punishments and rewards, plays and games, anthropological and psycho-physical observations, etc., and is highly praised by Ferrari in its second edition. L. Gualino's *Gli idioti ; Note di psicologia comparata* (Turin, 1905 ; pp. 57) is based on observations of some 100 idiots in various institutions in Turin, and draws analogies between idiots and members of inferior races, etc. G. Montesano's *Avviamento all'educazione e istruzione dei deficienti* (Rome, 1905 ; pp. 70) sketches the education of defectives according to the medico-pedagogical method of the author, who founded the Scuola Magistrale Ortofrenica at Rome. R. Brugia's *I problemi della degenerazione* (Bologna, 1906 ; pp. xxvi, 431), which has an introduction by MorSELLI, makes much of atavism, holding that the child, like the race, passes through a stage of 'unmorality,' previous to reaching morality (really a product of civilization). A. Roster's *Femina superior* (Florence, 1906 ; pp. 402) sustains the thesis that woman has a higher biological, psychical, and functional index than man. Her position is not now in accord with her superiority, because man made her 'the first domestic animal,' which she largely is still. Of N. Colajanni's *Latini e Anglo-Sassoni* (2d ed., Rome-Naples, 1906 ; pp. xvi, 436) a French edition has lately appeared. This book—the second Italian edition is the latest form—is a comprehensive comparison of the Latin and the Anglo-Saxon 'races.' It should be read by all Americans, who wish to see what an intelligent and widely-read Italian man of science thinks, *e. g.*, of 'the pseudo-civilization' of the United States at the present moment. Paolo Lombroso and Mario Carrara's *Nella penombra della civiltà* (Turin, 1906) is a study of 15 men and 28 women belonging to the poor classes (Piedmont workmen, country-people of Novi, Sardinian women) with respect to general culture, political-social ideas, moral sentiments, etc. The uniformity of dense, profound ignorance among the poor classes is lamentable, in face of the marvellous activity now going on in the field of art and of science. And this is in spite of elementary education, for to those who may properly be styled utterly uneducated (analphabetic) must be added a

large number of 'ignorants,' who have had some elementary education at least. Women are affected as well as men, and often in unexpected places. In matter of bibliography and criticism may be cited Lina Maestrini's *Sguardo alla pedologia negli Stati Uniti ed in Europa* (Bologna, 1905; pp. 67), reprinted from the *Rivista di Filosofia e Scienze affini*. It contains an appreciative account of child study in America.

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CHILD PSYCHOLOGY.

First Steps in Mental Growth. DAVID R. MAJOR. New York, The Macmillan Co., 1906. Pp. xiv + 360.

In this volume Professor Major presents the results of extensive observations and experiments which he made upon his own child during its first three years. The material is classified under the following general headings: development of hand and arm movements; drawing; the feelings and their expression; development of imitation; color; number; form; association; memory; imagination; play; pictures; behavior of the child before his image; language; sight; hearing; learning to stand alone; learning to walk; table of measurements. The work is illustrated with figures showing the child's pencilings and efforts at drawing, and with twenty-two photographs showing certain typical motor adjustments and activities.

It has not been the purpose of the author to write a book on developmental psychology, but rather to make a contribution of valuable material for such a psychology. He therefore carefully records what he has seen and heard from day to day, but only rarely does he attempt psychological interpretations. His own observations are compared with those of Preyer, Sully, Darwin, Shinn, Baldwin and other observers, and there is a close similarity all through. Sully is apparently quoted more frequently than any one else; and the *First Steps* seems much like the *Studies of Childhood* in its point of view. In neither book does one find new conceptions of developmental methods or processes, only a readable record of particular exhibitions of children's abilities. The various manifestations of any given trait or ability are noted in the order of their appearance, but in general they are not organized psychologically, so that the author's view is given of precisely why and how one manifestation follows another.

It appears to the reviewer that Professor Major should give us another volume, in which would be worked out theories of development based upon the data presented in the book under review. It would be profitable to have a more minute description of all the stages in learning typical activities, as, for instance, throwing a ball, so that we could see just what preceded any particular stage of achievement, and the *modus operandi* of learning. The author has in this volume, and doubtless wisely, considering the purpose of the book, given us only the main events in the acquisition of any ability, and consequently a mass of details, essential to a psychology of development, have been eliminated. It would be well in a succeeding volume to be detailed and specific in describing the child's efforts, instead of saying simply, he 'tried,' etc. "Precisely what did he do in 'trying?'" is the vital question. And then, "Why did he do just this?" is the next question that the psychologist must seek to answer. The observer who sees the whole situation—what has preceded the activity of the moment, and what it leads into—should be able at least to suggest an answer to these questions. For educational purposes the queries, How? Why? In what causal relations? are far more important than simply, What occurred? or, In what temporal relation?—though the latter must be answered before we can attempt the former, of course. The author frequently makes use of the term 'learning' how to do this or that; but he really gives us a record of abilities at different stages in the learning process, rather than a psychological account of how the learning proceeded. To describe the learning of any act requires that one show just how each step is taken and why, so that we may see the entire process as a unity, each factor or element of which is causally related to what precedes and what follows.

The photographs exemplify a kind of work that should be done much more extensively in the study of mental development. But they also need interpretation. Like the text, they present data which in isolated form have little significance for a theory of development, but they constitute valuable material for treatment in the spirit of developmental method.

In marked contrast to most current literature on mental evolution, the *First Steps* does not make use of the hypothesis of recapitulation in accounting for any of the phenomena of development. In certain instances, as in the treatment of fear, an attempt is made to show that the prevailing theory of the recapitulatory character of the child's early fears is unsound. It appears to the reviewer that the author is hardly consistent in his positions on this topic. He follows Sully in

ascribing fears of cats, dogs, insects, horses, wild animals, strangers, etc., etc., to the disturbing effects upon the child's unstable nervous system of strange and powerful sense impressions. But he cites instances of violent, convulsive fears where the exciting sense stimulus is practically nil, so far as its mere physical character is concerned. And to say that strange experiences arouse fear is simply stating a fact, not accounting for it. It is doubtful anyway if all novel experiences arouse fear; Sully and Major both give only a very limited number of such fears, just those which offhand one would say might be accounted for by recapitulation. Then Major cites cases of a continuance of a fear, as of a cat, which lasted for many days, though the animal was in the environment constantly. It would seem that the child's fear reaction outlasted for a considerable period mere strangeness in the object; and the stimulus could not be regarded as continuing to be 'powerful.' The fact seems to be that stimuli have the qualities of 'strangeness' and 'powerfulness' not because of any inherent quality, but because of the meaning which the child puts into them; and the recapitulationists appear to have the argument in their favor when they claim that this meaning in the case of the fears given by Professor Major is the product, not of individual but of racial experience.

It may be added that Professor Major's book is very readable, more so than most of those that treat the subject of mental development as it does. It will be enjoyed not only by psychologists, but also by teachers and thoughtful parents. It should help to convince skeptical persons that one may make a profitable and agreeable business of studying the development of his children.

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Comment doit-on mesurer la fatigue des écoliers? M. C. SCHUYTEN. Rapport au I^{er} Congrès international d'Hygiène scolaire à Nuremberg, 1904. Archives de Psychol., 1905, IV., 113-128.

Binet and Schuyten have sought to rehabilitate æsthesiometry as a practical and accurate method of testing mental fatigue. Schuyten's investigations, considerably less detailed and comprehensive than Binet's,¹ turn on a comparison between the dynamometer and the æsthesiometer as instruments of testing fatigue, a comparison in which the dynamometer has decidedly the worst of it.

The problem of determining with scientific rigor whether school work is carried on more advantageously in the morning than in the afternoon furnished the point of departure for the tests. Five school

¹ *Année Psychol.*, XI., 1-37; see review in *PSYCHOL. BULLETIN*, III., p. 110.

children were tested with the dynamometer in the morning with an average result registering 63. The same group subjected to the same test in the afternoon gave an average result of 60.3. The first interpretation likely to be made is that the dynamometer has served as a test of the fatigue of the school day. But Schuyten subjected another group of five children to the same test, this time beginning in the afternoon. The average result of the afternoon was 68.3. On the morning following the test was repeated, giving a result of 64.2. Clearly the dynamometer does not test the fatigue of the school day, the author infers, but the interest which children have in a novel experience. A parallel test with the æsthesiometer was arranged. No particulars as to the technique of the test are given. From the morning-afternoon test the average result of the morning was a minimum discrimination of 7.8 mm.; of the afternoon, 11.3 mm. But the decrease in tactual sensitiveness thus evidenced may be equivocal. Is it due to failing interest as the novelty wears off, or is it due to fatigue? To answer this question an afternoon-morning test was made on a different group of children. The afternoon test gave an average result of 11.4 mm. The test of the morning following, 8.3 mm. These figures clearly indicate, concludes the author, that the æsthesiometer has tested not interest in novelty but fatigue itself.

The author admits that the data are too few for the final determination of the matter. It is a little strange, perhaps, that data so readily multiplied should not have been obtained in sufficient abundance to establish, or possibly to undermine still further, the validity of a method so long under suspicion as that of testing fatigue by æsthesiometry. Nevertheless the comparatively few data presented are sufficiently striking to lend considerable color to the inference that the dynamometer is a poor second to the æsthesiometer as a test of fatigue.

Observations sur le langage intérieur des enfants. AUGUSTE LEMAITRE. Archives de Psychol., 1904, IV., 1-43.

The interest in mental imagery, particularly in the imagery of language, as represented in the studies of Egger, Galton, Stricker, Ballet, and Saint-Paul, M. Lemaître has specialized in the direction of the language imagery of children. This monograph opens with an extended résumé of the author's recent book, *Le langage intérieur chez les enfants*, followed by descriptions of eighteen newly observed cases, several of which border on the unusual if not on the abnormal. The variety of imagery which may be associated with the language function receives fresh emphasis. *Verbo-moteurs, verbo-auditifs, verbo-*

visuels, symbolo-visuels, auditivo-visuels, visuelo-moteurs, équilibres, descriptive terms employed by the author to characterize the chief types of language imagery encountered, if not in every instance self-explanatory, are at least indicative of the extent of psychical territory that may be covered in this hunt for new specimens. The method of obtaining data is still, apparently, that of informal interrogation. M. Lemaitre's statement of results and conclusions contains several exceedingly suggestive remarks. According to M. Lemaitre's general observation, fortified by an experimental test, the visual and auditory types of memory are much superior to the motor type. The exceptions seem to prove the rule. Occasionally a *moteur* will be found whose memory is remarkable. Further inquiry has revealed, however, that this is the result of unusual effort in fixing upon points to be retained. It is a cultivated virtue. To the visual and auditory types memory comes naturally or with much less conscious effort.

M. Lemaitre presents fresh observations on the point that visualists manifest the strongest æsthetic dispositions. Children of this type are more facile than those of either the auditory or motor type in reproducing from memory scenes they have witnessed and in drawing designs. In regard to intellectual disposition, the auditory type seems to stand midway between the motor and the visual, seizing with equal facility the abstractions of the former and the concrete particulars of the latter.

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Street Games of New York City. JOHN CHASE. Ped. Sem., 1905, XII., 1.

The writer kept records of games played by children in a certain section for two years, and concluded that the ten games most played (which are different from lists obtained from children) show the fire and gambling instinct to be strong, that these popular games are going generally at the same time of the year, and that running games, such as tag and prisoners' base, are replaced by cramped games like leap-frog and hop scotch.

How Children Learn to Read; an Experimental Study. LUCINDA PEARL BOGGS. Ibid.

She tested four children under school age with cards on which was a Greek letter, a syllable or phonogram, a familiar word and a simple sentence. These were printed on cards and were shown a line at a time, the experimenter naming and the children repeating after

her. After this they were exposed again and the child named all he could, and was again told those he could not name. In this way the number of exposures required to learn each element was determined.

In all cases the sentence was recognized with fewer repetitions than the words and the words than the syllables, while in cases where children had not had any letters, syllables were recognized more readily than the letters. The result of this test brings out what cannot be too much emphasized in teaching — the importance of content and interest, as compared with form, however simple, without content or interest.

Studies of a Child, III. ALEXANDER and ISABEL C. CHAMBERLAIN. Ibid.

This is a continuation of the various specific facts recorded by Dr. and Mrs. Chamberlain. These interesting records cannot well be summarized. The facts are grouped under the following suggestive heads: Discourses, Favorite Books, Language, Nature Study, Observations on seeing Pictures, Original and Peculiar Words, Original Languages, Sentences.

Pedagogy of History. G. STANLEY HALL. Ped. Sem., 1905, XII., 3.

In the grammar grades the scientific aspects of history should be subordinate, nor should knowledge of sources and habits of turning to them be most prominent, nor can civic interest be made prominent, because it is not great in girls and not yet fully awakened in boys. Finally, enlargement of mental horizon helps the youth to his rich ancestral heritage of great deeds. The dominant purpose in teaching history should be to develop moral character. To this end myths, often rejected by scientific history, are invaluable. The child should live again the life of the race. Other purposes are important, but this is the supreme one. Teachers should give much more than they expect to get back in recitation and examination.

Obstinacy and Obedience. THEODATE L. SMITH. Ped. Sem., 1906, XIII., 1.

Facts in large numbers regarding these phenomena as they ordinarily occur cannot be obtained readily in any other way than by a *questionnaire*, hence this method was very properly used. Reports of 668 cases classified as obstinacy, 148 as wilfulness, 341 as contrary mindedness, 261 as disobedience, including an element of obstinacy,

and 237 cases of animal obstinacy were obtained. The physical signs of those said to be obstinate are so opposite that there is good reason to believe that the mental states were entirely different. Individuality is marked, however, and in many cases one who knows the child or animal can tell when a spell of obstinacy is approaching.

So-called cases of obstinacy are sometimes simply strong instinctive tendencies, *e. g.*, running away without motive or special occasion. Insufficient food, over-eating, especially of sweets, are often causes of obstinacy. Mentally deficient children are often obstinate. Of mental causes injustice is a frequent one. In some reminiscent reports of obstinacy the seeming powerlessness of the individual to end the obstinate state is a marked feature, while in other cases the individual is continually affirming 'I won't.' Institutional obstinacy was given special study, many facts being found to indicate that continuous living under strict rules tended to produce obstinacy or occasional outbreaks of it. Individual treatment usually decreases obstinacy.

Questions regarding the most obedient children indicated that such children were strong willed and had been trained in a reasonable way to obey from a very early period.

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HANDWRITING AND INTELLIGENCE.

Accuracy in Handwriting as related to School Intelligence and Sex. ARNOLD L. GESELL. *Amer. J. of Psychol.*, July, 1906.

Teachers in all the nine grades of the schools of Worcester were asked to furnish specimens of the writing of the three best and three poorest writers in their schools, also of the three pupils having the highest and the three having the lowest standings in school work. They were also asked to grade all these pupils as to School Intelligence, General Intelligence, Motor Ability, and Facility in Writing. The results are as follows :

	Sex.		School Intelligence.				General Intelligence.				Motor Ability.			Facility in Writing.		
	Boys.	Girls.	Very Good.	Good.	Fair.	Poor.	Very Good.	Bright.	Average.	Dull.	Clever.	Average.	Clumsy.	Ease.	Moderate Ease.	Effort.
Best writers.	122	193	86	105	82	30	12	122	168	25	124	174	13	187	115	10
Poorest writers.	238	77	26	54	92	88	50	60	160	95	18	124	152	52	103	148
Highest in school work.	147	168	236	64	5	—	—	269	46	—	159	146	17	171	111	26
Lowest in school work.	174	141	—	—	22	123	170	11	97	204	23	149	137	56	141	104

Papers from a school for feeble minded children show similar marked correlation between writing and intelligence. Figures for each grade are unfortunately not given, but it is stated that in this respect there is slight variation. The large proportion of poor writing among the boys and of good writing among the girls is even more marked when the very best and the very poorest specimens are selected, and is still more marked in the specimens of the writings of high school pupils, 76.6 per cent. of the best being by girls and 80 per cent. of the worst by boys.

The correlation between writing and intelligence seems to be closer than for any other of the numerous tests of intelligence that have been made, while the difference between the sexes is much greater. But it should be remembered that the kind of intelligence shown in good writing is probably the chief kind of intelligence upon which the average teacher grades pupils and judges of their ability. After a pupil has learned to write, interest passes to the ends to be gained by writing, hence girls as they grow older write well because good writing is asked for and praised, while boys follow their interests, cease to improve and often become poorer writers. This interpretation corresponds well with the fact stated by the author that up to the fifth grade as many of the boys are best writers as girls, while after that the number of best writers is much greater for the girls. Theory as well as tests of normal children and experience with feeble-minded children indicate that sensory motor activities such as writing are correlated with the earlier stages of mental development, but not with the higher stages. This accords with the author's data showing that sex differences are less and correlations with intelligence greater in the case of feeble-minded children.

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BOOKS RECEIVED FROM OCTOBER 5 TO NOVEMBER 5.

- Le sens de l'Art, sa nature, son rôle, sa valeur.* P. GAUTIER.
Preface by E. BOUTROUX. Paris, Hachette, 1907 (for 1906).
Pp. xxxii + 269 (with 16 figures).
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nology. Pp. ix + 742. Boston and New York, Houghton,
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tions, compiled by CLARA S. ELLIS. Boston, Badger, 1906.
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NOTES AND NEWS.

DR. IRVING KING, of the University of Michigan, and Dr. Felix Arnold, of New York, are to give three lectures each in Baltimore the third and fourth weeks of November, in the course on Educational Psychology for Teachers opened by Professor J. Mark Baldwin's lectures now being delivered.

WE note the announcement of the founding of the *Biophysikalisches Centralblatt* (Borntraeger, Berlin; ed. by Oppenheimer and Michaelis; subsc. 30 marks). It is intended to serve as a 'Centralblatt für die gesamte Biologie.'

THE 'Gesellschaft für experimentelle Psychologie' has organized an 'Institut für angewandte Psychologie und psychologische Sammel-forschung' (Berlin-Wilmersdorf, Aschaffenburgstr. 27), which it is proposed to make a central station for the organization of general investigations having a practical bearing (pedagogical, juristic psychology, etc.) and for collections of psychological material. The topics proposed for immediate investigation include the development of speech and thought in early childhood, psychology of testimony, tests of intelligence, development of unusually gifted individuals, etc. The institute will publish an organ, the *Zeitschrift für angewandte Psychologie und psychologische Sammel-forschung*, to begin in 1907, edited by William Stern and Otto Lipmann.

NEW editions of Professor Baldwin's *Mental Development: Methods and Processes* (3d ed., 7th printing, revised and entirely reset) and *Social and Ethical Interpretations* (4th ed., 6th printing, revised) are in press for immediate issue (Macmillan Co.).

THE following is taken from the press:

PROFESSOR G. V. N. DEARBORN, of Tufts College, has been appointed lecturer and instructor in the relations of body and mind in the Sargent School of Physical Education, Cambridge.

THE PSYCHOLOGICAL BULLETIN

THE IMAGINATION IN WUNDT'S TREATMENT OF MYTH AND RELIGION.¹

BY PROFESSOR GEORGE HERBERT MEAD,

University of Chicago.

Two years ago,² the writer called attention to the importance of the task which Wundt has set himself in these later years of his scientific activity. It is the task of interpreting the development of the products and processes of human society in terms of the psychological standpoint which he has rendered definite and commanding through a lifetime of arduous labors. Those first results appeared in the two parts of the first volume of his *Völkerpsychologie*, and dealt with the highly complex and illusive processes of speech and their products, preserved for us in language. Apart from the decisive advance which the substitution of a modern psychology for the Herbartian, which has persisted in philology and education, brings with it, we pointed out the searching test to which this undertaking subjected the concepts and categories of the Wundtian psychology. In particular there arose in the consideration of the problems of language an opposition between the structural contents which were assumed to be given and the associative and especially the apperceptive processes by which these were organized into cognizable wholes.

The difficulty, however, did not reach such definite proportions in the treatment of language as those which it assumes in the last volume which Professor Wundt has recently published — the first half of the second volume of his *Völkerpsychologie* — which deals with Myth and Religion. One has, to be sure, in reading this volume the same sense of a mind moving easily and surely within a vast labyrinth of material, because it possesses a clue enabling it to pass comprehend-

¹ This number, dealing especially with social psychology, has been prepared under the editorial care of Professor J. H. Tufts.

² PSYCHOL. BULLETIN, Vol. I., No. II.

ingly wherever it will. Whatever conclusion the reader may come to touching the adequacy of his account from the point of view of psychological theory, he cannot for a moment question the control over this enormous field which a consistent psychological standpoint gives. It is not only that generalizations are possible which the anthropologist and sociologist have not succeeded in making, but that these generalizations order not only the material but also the innumerable theories which have dealt with it in the past.

Wundt's fundamental position is that the mental processes, which have given rise to myths and the constructive art that has embodied them, are quite identical with the immediate processes of sense-perception as they have existed among primitive peoples, as they exist among such peoples to-day, and as they exist in the most reflective communities. The difference lies in the fact that our reflection checks and criticises an apperception which otherwise would animate nature and its objects for us, as it has for all communities before reflective consciousness becomes dominant. The common defect therefore in all the theories which have been offered in explanation of rise of myths — the symbolistic, the rationalistic, the analogical, the importation, the illusion, and the suggestion theories — is that they have one and all assumed that myths existed in the minds of primitive peoples as explanations of various phenomena, such as life and death, the change of the seasons, growth and decay, etc., when in reality dream figures and ghosts, personified animals, plants and inorganic things, were the direct apperceptions of uncritical natures. And the specific task which Wundt undertakes is that of so analyzing impression, association, and apperception that we shall see only a difference in degree between our affective presentations of natural objects and the 'personifications' thereof by more primitive men. The phase of the perceptive process which affords the material for this interpretation, is the imaginative. Phantasy or imagination is at work in all our perceptions, filling in the outlines and incomplete presentations of the senses, enriching our associations especially with feeling-contents, and finally projecting us into the objects of our apperception, through the merging of objective data of the sense-process and the subjective reaction thereto in an indissoluble whole. This does not imply of course that imagination is a separate faculty or power. "This activity of the imagination is nothing which is added to the other conscious processes as a field of specific phenomena or as the expression of a separate power, but is simply an expression for the mental processes in general, when these are viewed from the point of view of the interaction of outer impressions with the

traces of former experiences, and under the peculiar condition that the results, arising from this interaction, arouse feelings and emotions, which the perceiving subject projects into the objects, while they are still experienced as subjective excitations. This process accompanies in a certain degree all contents of consciousness, since there are none in which direct and reproductive elements do not coöperate in stronger or weaker affective reactions. The activity of the imagination, therefore, is simply an enhancing of these normal functions, taking place under favorable circumstances. In the same fashion we may add that the mythological imagination is no mental power, formerly present and now lost, but it is in its whole nature identical with imagination in general."¹ In this sense Wundt analyzes the imagination as it appears in spatial perception, in temporal perception, in the contents of its images, in childhood, and finally in art. It is in the æsthetic consciousness that it finds its most characteristic expression, and our introspective presentation of it he identifies with the 'feeling-in' (*Ein-fühlen*) which has become so common a term in modern psychological æsthetics. "The 'feeling-in' is supposed to make comprehensible on the one side the effect of the impression on the affective consciousness (*Gemüt*) of the observer, and on the other the immediate relation of the subjective excitation of the feelings to the object. 'Feeling-in,' in this sense, in the nature of the case is no process that is confined to æsthetic objects, but forms a necessary coefficient of every possible presentation, whether this is a so-called perception or an image of the fancy. In its psychological nature this 'feeling-in' is the part of the assimilation-process involved in the formation of every presentation, which lies upon the affective side. It is in so far a double-sided assimilation of the feelings, as the motives to association that are bound up with the objective impression are inseparably merged with those subjective motives which spring from the immediate reaction of the impression upon the body itself, its volitional activities, and the associated feelings."² The importance of this identification for Wundt's theory is evident when we read in the chapter dealing with Mythological Apperception: "Thus the mythological personification is only a heightened degree of all those processes, which one has termed 'feeling-in' in the analysis of æsthetic effects. The æsthetic feeling-in is nothing else than a reduced form of mythological personification, and this itself is the æsthetic feeling in its highest degree, where the whole personality, in its momentary state of consciousness together with the

¹ *Völkerpsy.*, 2. Bd., 1. Abt., p. 579; cf. Chap. I.

² *Ibid.*, pp. 41, 42.

after effects of former experiences that enter into it, passes over into the object. As æsthetic feeling-in and mythological personification are different only in degree and not in essence, so they are both, finally, only modifications of a more general function, without which the object, which both the æsthetic as well as the myth-building phantasy imply, would not exist for our consciousness, *i. e.*, apperception."¹ This animating (*belebende*) apperceptive process looked at from the point of view of the heightened activity of the imagination Wundt considers his first principle in the psychological explanation of the social phenomena which are included under the rubric of Myth and Religion. The second principle he denominates 'the feeling-enhancing power of illusion.' We shall presumably hear more of this second principle in the second part of this volume where the phenomena of religion, it is to be supposed, will be dealt with more particularly. Only so much needs to be emphasized in reference to this second principle, that, in the structures of imagination, it is the subjective rather than the objective factors which give determining affective moments to the impression, so that it is with the increase of this factor of the imagination that the increase of the emotional effect of the impression goes hand in hand.² It is perhaps hardly necessary to call attention to the fact that these factors are the feelings, in the sense in which Wundt has finally defined them in the last editions of his *Grundrisse*, and the *Physiologische Psychologie*; that is, contents of consciousness which have not only the attributes of pleasantness and unpleasantness, but also those of excitement and depression, and of strain and relaxation. These contents cover, therefore, what other psychologists have ascribed to our kinæsthetic sensations. I wish to call especial attention to this value which feeling has for the author, because of its important result in the psychological interpretation of myths and religions. For these feeling-contents are not confined to the field of this second principle, but play perhaps as important a part in the interpretation of the animating apperception. Wundt points out that the content of our images is only in a small degree what comes through the objective sense-processes. It is possible for a nonvisualizer to have vivid imagery that has to do with objects which are sensed by the eye and the hand. Where he does not depend upon the visual and tactual contents, according to the author, their place is taken by the feelings. The result of this use of the term is that what may be presented in terms of the kinæsthetic sensations has for Wundt the peculiarly subjective character that goes

¹ *Ibid.*, pp. 579, 580.

² *Ibid.*, p. 63.

with the affective phases of consciousness. It has not only this; it has practically the static value which these phases possess, which is in crying contradiction with the kinæsthetic contents which they are called upon to represent.

In insisting upon this latter point I have reference not so much to the presentation which Wundt makes of the feelings in his works on individual psychology as to the results which appear in his treatment of the constructions of the imagination, especially in dealing with the art of children and primitive peoples.

One other characteristic Wundtian category should be referred to before a final estimate of his interpretation of these social phenomena is presented. I refer to apperception. In discussing impression, association, and apperception, the author says: "These concepts indicate at bottom only one and the same process, that is viewed each time from another side: as impressions, when we attend especially to those associations which subsist between the elements which have just entered consciousness; as associations in the narrower sense, when we consider the relations of these elements with the multiform former experiences of the same conscious individual; and finally as apperception, when we emphasize the comprehension of all these factors in a resulting conscious function. As little as there is ever an impression which does not contain numerous associations, so little is there any association-process which does not order itself under a result that includes all the associations of objective and subjective elements, of which the immediate state of consciousness consists."¹ And finally: "That power of these associations includes as well, and as essential factors, those associations which build themselves up between the feeling and volitional impulses and the objective contents of consciousness. The resulting effects of these blendings and assimilations of both elements is apperception, which is for this reason the most unitary function of consciousness, comprehending all other mental processes."² Here we have apperception — the organizing function of consciousness — stated in terms of association, not association interpreted in terms of apperception. The actual use of this conception results in the explanation of all conscious activities in terms of elements already there with their associations determined by the structure arising out of past experience, plus the immediate experience. Of course the value — the meaning — of this immediate experience must come in terms of the associations already worked into the warp and woof of consciousness. In other

¹ *Ibid.*, p. 589.

² *Ibid.*, p. 588.

words, the only direction which consciousness finds lies in the associations already present. There is no hint that among an indefinite number of such associations there may be selection, determined by the activity which is going on. And yet this is just what introspection reveals to us, an organized group of associations arising in response to the demands of the particular situation within which we find ourselves. In this treatise Wundt regards apperception as a simple necessity that lies upon all our associations of appearing in unitary wholes, not as the directing and controlling action of consciousness selecting these associations. The actual apperceptions are explained in terms of existing associations and not vice versa.

Now it is evident that these two concepts, that of feeling and that of apperception, go hand in hand. The sense of active direction which introspection reveals attaches itself to kinæsthetic experience, and in proportion as we substitute structural contents of feeling for these kinæsthetic contents in that proportion do we rob consciousness of explicit direction.

Returning now to the problems which Wundt has undertaken to solve, we find him accounting for every product of the mythological imagination as a work of art that finds its *raison d'être* and its attraction for the social group in the feeling contents, and the æsthetic response thereto (Einfühlen). He follows out in a remarkably clear analysis the development of ideal art through the stages of momentary, memory, decorative and imitative art. In every case he affirms that the constructive act arises in response to an outer stimulus, and the value of this stimulus lies in the feeling content which it possesses. One seeks an object that will be a more admirable carrier for this feeling content. In incidental art it is but a passing impulse, which may come under the impulse to communicate and so this art tends to pass into the class of language expression. Memory may be influenced, in part, by the thought of the lasting character of the presentation, but this is not the immediate ground of its construction. Decorative art arises through the associations of the form of the utilitarian object or its markings with animals and men. In personal decoration at first the terrifying effects of tattooing and markings may be present, but Wundt presents it as a production which simply calls forth a feeling, as if there were a natural passage from the feeling to that which produces it, apart from the valuable effect that this might have in battle. In every case the psychological account of the appearance of the product is found in the relation of the feeling content to the artistic construction of the object. It is only secondarily that it may be selected to perform certain functions

with the social group. Finally, out of the control which the primitive artist has obtained over the material and technique arises the possibility of the free expression of those objects in nature which are the carriers of his affective reactions, and from this, through the emphasis upon the characteristics which call forth feelings, he advances to the construction of works of art which are the embodiment of his ideas and serve to set free those affective contents which are seeking expression. We find a similar analysis in the psychological development of the so-called musical arts, dance and music, leading on to the song, the epic, and the drama. Finally, in the discussion of the mythological imagination we meet the generalization of his interpretation which has been already given at the beginning of this paper.

It would be difficult to convince one who approached without psychological presuppositions the history of primitive art and mythology, that the functions which the early products of a constructive imagination fulfilled in the social life of the group did not determine the psychological growth of the products themselves, that the function which the æsthetic image had in the social consciousness was not active until the product arose in response to the simple demand for a carrier of the feelings, that the selection which must have been responsible for their preservation had nothing to do with the inner activities by which they were produced; and yet this seems to me the logical result of Wundt's analysis. In a word, for him, the æsthetic image, whether existing simply in the mind or embodied in an outer form, has no function beyond that of responding to and heightening the affective experience. If such a statement seems an adequate psychological interpretation of the ideal artist and his creations it certainly breaks down when applied to primitive art.

WESTERMARCK ON THE ORIGIN OF MORAL IDEAS.¹

BY PROFESSOR JAMES H. TUFTS,

University of Chicago.

Dr. Westermarck's massive work, of which the first volume has appeared, has two main divisions. On the one hand the origin of moral ideas and moral judgments is sought in the emotions; on the other the phenomena which among different peoples and in different ages have had a tendency to call forth moral blame and moral praise are examined.

Moral ideas, according to the author, who follows a well-known line of British tradition, are based on emotions of indignation or approval. The moral concepts are essentially 'generalization of tendencies in certain phenomena to call forth moral emotions.' The apparent objectivity implied in moral judgments is not due to their rational character but to 'the comparatively uniform nature of the moral consciousness.' Custom has made men feel alike. 'Public indignation and public approval are the prototypes of the moral emotions.' Intellectual considerations have an important influence in the development of the moral consciousness from the unenlightened to the enlightened, but as the emotional constitutions of man differ there will always be ultimate differences in judgments.

As regards their nature, the moral emotions belong to the general class of retributive emotions. They are distinguished from other retributive emotions by their 'disinterestedness,' 'apparent impartiality,' and 'a certain flavor of generality.' Waiving for the present the question as to the adequacy of this analysis, the interesting point for social psychology is then, What are the sources of these distinguishing qualities?

Sympathy due to association, sympathy with 'the coöperation of the altruistic sentiment or affection,' sympathy as contagious emotion, disinterested antipathies of a more or less æsthetic sort and the corresponding sympathetic approvals, explain the disinterestedness. The 'apparent impartiality' and 'flavor of generality' are derived, on the

¹*The Origin and Development of the Moral Ideas.* By EDWARD WESTERMARCK, Ph.D. In two volumes. New York, The Macmillan Co. Vol. I., 1906, pp. xxi + 716.

other hand, from the influence of custom. "The most salient feature of custom is its generality. Its transgression calls forth public opinion; hence the flavor of generality which characterizes moral disapproval." 'Apparent impartiality' has its root here also, and disinterestedness receives reinforcement.

The further question now presents itself. Is the essential moral aspect of the emotion its relation to custom, or is it its public character? Is moral = habitual (non-habitual), or is it = public? Does the morality depend on the customary, or does the customary have some other element than its habitual character, and is it this which is regarded as moral? Westermarck decides for the latter alternation. "Custom is a moral rule only on account of the indignation called forth by its transgression. In its ethical aspect it is nothing but a generalization of emotional tendencies applied to certain modes of conduct and transmitted from generation to generation" (Chap. V.). Apparently, therefore, the 'apparent impartiality' and 'flavor of generality' do not enter as integrant elements into a complex moral emotion which gets its moral value only because of these and other additions. Rather, custom adds these elements to emotions already moral if they are (*a*) retributive and (*b*) public.

But what on this view are we to understand by 'recognizing the validity of a custom?' (p. 120). "By recognizing the validity of a custom, I implicitly admit that the custom is equally binding for me and for you and for all the members of a society." This must on the above theory logically mean: By recognizing that a custom calls out public indignation, I admit that it calls out equally my indignation and yours and that of all the rest, *i. e.*, by recognizing it as general I recognize it as general.

There is of course one condition under which this sentence ceases to be tautology, namely, if we make a distinction between the 'indignation of all' and 'public indignation,' similar to that in Rousseau's *volonté de tous* and *volonté générale*. But this involves a reconstruction of the whole theory of the moral emotions. If we take the emotions in their primitive reaction they are nearly if not quite coördinate with the instincts. They are as social, as general, as the instincts bred in by the struggle for individual and group existence. If we take resentment for illustration, there is no doubt a resentment of group injury among animals which is purely instinctive, just as there is individual instinctive resentment. But *as such*, it would seem unnecessary to point out if such a well-read author did not seem to ignore it, one is no more moral in the proper sense than is the other. Only when

there is some conscious comparison, some voluntary choice, do we have moral emotion. But when we reach this stage the emotion is no longer what it was. Its thrill and tension are no doubt primitive, but the self whose purpose now overflows in emotion, the self whose struggling conations are appreciated in the tension of duty, is now another self. 'Righteous indignation' may get its flame from the fires of individual and race antagonisms; it becomes righteous only in view of a system of ideal and social ends. The good of the group must be present not only instinctively but consciously; the emotion of purity must be more than instinctive repulsion by the female, or instinctive jealousy in the male. It is right, I think, to find the antecedents, the roots of morality in the instincts, impulses, and attendant emotions; it is an inadequate psychology to set off the emotions as a set of phenomena apart by themselves and base moral judgments upon them.

The latter division, including both a general survey of the general characteristics of responsible action and a detailed account of particular modes of conduct which are praised or blamed, occupies the larger part of the work and is the most valuable portion. It contains an enormous amount of material as to primitive views of conduct, arranged under six topics: (1) acts, forbearances, and omissions that directly concern the interests of others; (2) those that concern the man's own welfare; (3) sexual relations; (4), (5) and (6) conduct toward lower animals, toward the dead, and toward supernatural beings, real or imaginary. There is an effort in the treatment of this material to do more than merely record the various usages on the hit-or-miss, crazy-quilt fashion which has become almost a sacred style for anthropological material. There is some attempt at interpretation of the material presented. For example, in the chapter on Hospitality the effort is made to explain the seeming contradiction between the limited social bond of the group and hospitality shown to strangers. The view presented, which is more clearly worked out by the author in a paper read before the Sociological Society and printed in their *Sociological Papers*, Volume II., is that this is due to the supposed magical efficacy of the stranger in bringing good luck or a curse, the food acting as the medium of communication for the magic influence.

Probably a book on the plan of the present work is the necessary book at this stage. And yet it serves to emphasize very forcibly the need of another book which shall use the materials in another way,—a book which shall not only describe the customs and laws of various peoples, at different times, concerning life, property, sex, and the

other world, but also enable the reader to grasp as a whole the developing spirit which is disclosed in all these diverse methods of control and approvals. We need a fuller relation of the moral to the economic and industrial conditions. We need to see more fully why there has been advance in some cases and not in others. For such a work the materials are rapidly accumulating, and the methods by which they may be interpreted are becoming clear.

PSYCHOLOGICAL LITERATURE.

GENERAL SOCIAL PSYCHOLOGY.

Instituts Solvay. Institut de Sociologie. Notes et Mémoires. Librairie Misch & Thron, Brussels.

1. *Note sur les formules d'introduction à l'énergétique physio- et psycho-sociologique.* E. SOLVAY. 1906. Pp. 24. Fr. 2.
2. *Esquisse d'une sociologie.* E. WAXWEILER. 1906. Pp. 306. Fr. 12.
3. *Les origines naturelles de la propriété.* R. PETRUCCI. 1905. Pp. 246. Fr. 12.
4. *Sur quelques erreurs de méthode dans l'étude de l'homme primitif.* L. WODON. 1906. Pp. 37. Fr. 2.50.
5. *L'Aryen et l'anthroposociologie.* E. HOUZÉ. 1906. Pp. 177. Fr. 6.
6. *Mesure des capacités intellectuelle et énergétique.* CH. HENRY. Avec une remarque additionnelle: *Sur l'interprétation sociologique de la distribution des salaires.* E. WAXWEILER. 1906. Pp. 75. Fr. 4.
7. *Origine polyphylétique, homotypie, et non-comparabilité des sociétés animales.* R. PETRUCCI. 1906. Pp. 126. Fr. 5.

The Solvay Institut de Sociologie, founded in 1902 by M. Ernest Solvay and situated in Brussels, puts forward the above evidences of vigorous production by the Director, Emile Waxweiler, his collaborators, and others. Several of the various monographs have a certain community of point of view. The effort is made to relate social phenomena in man to corresponding phases of animal life, and in method to find at least a starting point in general biological conceptions. The first brochure, by M. Solvay, founder of the institute, is however of a mathematical character.

The numbers which are of interest from the standpoint of social psychology are (2), (3), (4) and (7).

In (2), *Esquisse d'une Sociologie*, the author finds his point of view in the conception of Ethology. This term is taken, not in Mill's sense of science of character, but in the sense for which the term Ecology is also employed, to designate a study of organisms in relation to environment. Disregarding the relation of the individual to his cosmic environment, the sociologist notes among the relations to the

living environment those involved in the facts of species. These facts may be considered as including a threefold specific affinity: sexual, which implies fecundity limited by the species; vegetative, which determines the relations of cells derived by auto-division from another cell, whether these form cell-colonies or a single organism; and social, which leads the individual to establish relations with others in which it finds similarity of organization. Specific affinity may be defined as 'a particular aspect of the physical sensibility, which renders it susceptible of responding, in determinate conditions, to excitation from the other individuals of the same species.' Social affinity will be such a sensibility as 'renders an organism susceptible to the excitations of other individuals of the same species without distinction of sex,' and this is the fundamental fact for sociology. This is similar to the 'like response' which Giddings makes the basis for the 'consciousness of kind,' but the author regards it as more fundamental, since it might exist without there necessarily being a like response. It has also the decided advantage that it centers emphasis upon the interdependent relation rather than upon a perception of similarity. Sociology may then be called "the science of the phenomena of reaction due to the mutual excitation of individuals of the same species without distinction of sex."

The analysis of these phenomena of social affinity which occupies the larger part of the volume is sketched in outline, rather than worked out in detail, and seems hardly as fruitful as the central conception would lead the reader to expect.

In the third monograph M. Petrucci has given a very instructive study of the relation of property to the individual and to the group—family, clan, or people. Instead of the abstract discussions often found as to private or group ownership, we have an effort to relate forms of property to biological and psychological conditions. It is thus in some respects correlative to the admirable study made some years ago by Grosse of the relation of the various forms of the family to economical and industrial conditions.

Premising that individual and collective possession have their roots in the two fundamental sets of instincts, those for individual needs of support, attack, defense and protection, and those for the maintenance of the species and its interests, the author is led to examine the sub-human manifestations of these instincts and the forms of possession, if not of property in the full legal and moral sense, which arise from them. Even plants show the two forces at work in their methods of exploiting the soil and storing nutritive reserves. Mollusks and worms

show predominantly individual types; the corals, however, afford an interesting example of colonial structure, with individual tubes, joined by transverse supports. Insects, of course, furnish in the ants and bees the extreme evolution of collective property where certain members are employed as store-houses for nutriment. Birds with their family life have in their nest a family property, although the social species in their exploited territory assert a collective rather than an individual or family control, and some of them in their nesting colonies have rather group than family nests. And on the other hand, in some species individuals have their own permanent dwellings. The three types, individual, family, and group property, are thus all foreshadowed in bird life, and mammals repeat these three types with various degrees of emphasis.

The principal factor which marks property among primitive man, as in any way distinct from the animal types, is the making and use of permanent tools and arms and clothing. These maintain their individual character. Family property is more likely to appear in the dwelling, and group or collective property in the territory exploited, although we find here also collective property in dwellings, and on the other hand in some cases families exploiting each its own territory. No such extreme of collectivism as that among the hymenoptera appears in human societies.

The analogies found show therefore that the social fact (in this case, the fact of property) is not bound up with the biological evolution in such a way that the biological perfecting gives at the same time the social laws (p. 218). The phenomena of property may be summarized in the following six principles: (1) Property appears as a phenomenon attaching to the first manifestations of life. (2) It is at first the expression of an individual structure and an adaptation. It takes (3) the individual form when it is determined by the biological law of the protection of the individual; (4) the family form when determined by the law of protection of the species, realized on the basis of the sex instinct; (5) the collective form when determined by the law of protection of the species, realized by the phenomena of association, considered generally and abstracting from the family group. (6) The individual, family and collective forms of property are specifically distinct, and are characterized respectively, (*a*) by reflecting the proper structure and activities of the animal considered in isolation; (*b*) by the predominance of the associative tendency limited by the parental group, (*c*) by the unrestricted predominance of the associative tendency. An excellent chart shows the facts with reference to the three

kinds of property in the three cases of food reserves, exploitation of territory, shelter and dwelling.

The 'errors of method in the study of primitive man,' to which M. Wodon's discussion is devoted, are those committed in the author's opinion by Karl Bücher. The doctrine of a non-industrial and non-economic primitive condition, the doctrine of the differentiation of the work of the sexes, and the view that play and art precede serious production are criticized. The postulate that dispositions or modes of conduct which do not harmonize with the conditions of life at a given stage may be regarded as survivals of a previous stage and therefore used as data from which to construct that previous stage, is easily shown to be unsound. There is not, however, an adequately supported discussion of the views presented in opposition to those of Bücher.

In the seventh number of the series M. Petrucci examines the various types of social life among animals with the purpose of discovering (1) whether these forms can be regarded as forming a linear series of development, corresponding in evolution to the biological 'higher' and 'lower'; (2) how much of the human social instinct may be regarded as hereditary. These questions involve, moreover, (3) some suggestive queries as to how far certain peculiarities of human societies found in tabus, in totem groups, in separation of groups of unmarried males, etc., are really as purely instinctive and without rational explanation for their origin as are the corresponding phenomena among animals.

The conclusions under (1) and (2) may be briefly stated. The social forms of animal life cannot be arranged in a serial order of lower and higher corresponding to biological development; they are of polyphyletic origin. The successive appearance of similar forms is homotypic, not hereditary. The only hereditary factor is the tendency to group. But this takes on the form of maternal societies, or of paternal groups, of polygamous or monogamous groups, of flocks or colonies, not by any single serial law, but under the stimuli of varying circumstances, such as those of supply, defense, migration, or mating, and the care of young.

Some of the problems suggested under (3) are the following: We find among primitive peoples such facts as the separation of the adolescent into classes or groups apart from the families, or again the separation of males and females into distinct bands. These phenomena are found also among various animals. Woman in pregnancy is frequently regarded as unclean, and is among some peoples isolated. The isolation of females at the season of pregnancy is observed among rumi-

nants and birds. The aged females occupy a dominant position in many animal and human societies. We cannot say that these specific customs are inherited by man from the animal species which have them. The instances that crop out along various branches of the biological tree are not found in a consecutive line. But, on the other hand, does not the homotypy suggest strongly a similar cause? It wears now among human societies the appearance of religious custom. "The truth is that with man, as with the animal, the fact may depend on many other causes. The explanations given are constructed after the phenomena; they should be rejected. I confess, for my part, that the real cause remains for me unknown. I do not even see how investigation should be directed in order to discuss it." In the case of æsthetic phenomena the author draws a conclusion adverse to their alleged social origin. The bird decorates the bower; the primitive man decorates his cave with shining objects or gathers a store of bright stones. Sometimes this serves sexual ends, sometimes it merely affords pleasant sensations. "The æsthetic phenomenon is in nowise social in its origins; like property it is a something brought by the individual animal to the group to which he joins himself as integrant part. It becomes social with him; it is not such by its proper nature or by its origins." On this three comments may be made. (1) M. Petrucci draws very sweeping inductions from data in a single art. Song, music, dance, myth, story, are not reckoned with. (2) Few if any advocates of the social origin of art would wish to maintain this in a sense that excludes sex relationship from social factors. (3) What the present writer, for example, has maintained is, not that man as individual has not sensations pleasantly stimulated by color, sound, smell, and touch, nor that he does not adorn his person to provoke the passions of sex. It is rather that the detachment and the objectivity characteristic of the æsthetic, as compared with appetite and passion, is strongly aided if not entirely caused by the social as *versus* the individual attitude; and further that in the profounder æsthetic consciousness the idea of expression, of communication, of sharing, is an important factor.

J. H. T.

L'échange économique et l'échange affectif. F. PAULHAN. *Revue Philosophique*, 1906, LXII., 358-399.

The chief difference, as found by the author, between the economic exchange and the exchange of feeling, lies in the definite character of the one and the vague, indefinite nature of the other. In the economic exchange, the values are easily appreciable in numbers, the obligation is fulfilled by one act of a highly specialized kind. On the

other hand, the idea of measuring the value of a friendship has in it something repugnant. Neither is its obligation fulfilled by the return of a favor; it implies a promise of future acts and a complex variety of services. It therefore engages more of the personality. It is, however, always an exchange. The mother gives affection and care; but the child furnishes a soft, lovable object on which to expend devotion — a real exchange, since it gives pleasure to the mother. The exchange of feeling is also a real exchange in the sense that it implies a real obligation, failure to fulfill which, as in ingratitude, is censured as dishonesty would.

The two spheres are not after all wholly dissimilar. Money has an influence on health, on fame, on pleasure, even on the procuring of affection. It is not the sole cause, but may provide fostering conditions. One dislikes to consider a friendship in economic terms, yet many people would give up some friendships for the sake of a fortune. It is even possible that a legacy may deaden the grief at the loss of a parent. And friendships which seem to us beyond price may be measured in terms of other friendships, which in turn may be valued in money. Moreover, feeling comes to play a large part in economic exchange, particularly in small towns. Especially is one's feeling towards the social conditions of one's country affected by countless small economic exchanges.

The economic exchange corresponds to greater specialization and a more advanced organization of society. Hence, in times of peace and prosperity exchange tends to become more exact and less influenced by feeling. This is true even in personal relations of friendship; the greatest harmony results only when each knows exactly what he may expect from the other. Until this is attained, there is always danger of misunderstanding. The economic exchange therefore represents, when completely reached, the highest advance of which a given organization is capable. On the other hand, any sudden crisis tends to recall the exchange of feeling. A man who objects to what he considers excessive taxes, will die for his country in time of war. The activity of feeling indicates a period of stress, of disorganized life, and marks the beginning of a new progress. It corresponds to invention and will and all phenomena in which automatic routine is broken. When the stress is over, the new life immediately begins to organize itself along lines of economic exchange.

The change here is not from altruism toward egoism. Altruism and egoism only exist where there is a conflict of desires. In the pure economic exchange, both parties are absolutely satisfied. The

purchase of a postage stamp is an act neither of egoism or altruism; it is rather a suppression of both. It is in the same way a suppression of what are usually termed moral considerations, in favor of considerations of utility.

Each kind of exchange supplements the other; both are modes of progress. The economic exchange marks the end evolution in a particular system; the exchange of feeling enlarges and transforms the system, which the economic exchange again proceeds to regulate. This account is, however, only schematically correct. In reality, the two sorts of exchanges are infinitely complicated and intertwined one with another and an absolutely defined sequence, such as has been indicated, is perhaps never found.

A. L. STRONG.

UNIVERSITY OF CHICAGO.

Nature et Société. S. JANKÉLÉVITCH. Paris, 1906. Pp. 188.

For M. Jankélévitch the particular social sciences may furnish the data for sociology, but are useless unless permeated by notions of unity and interdependence drained from sociology considered as their philosophic source. This position he holds as a criticism of the naturalistic sociology developed through Spencer, Marx and Durkheim.

The author first marks off what he styles natural from social phenomena. The first deal with judgments of existence; the second with judgments of value. Sociology, since it has to reckon with these judgments of value, contains a peculiarly human element which vitiates conclusions of the statistical method applied to social phenomena. After a brief historical sketch of the application of the conception of evolution to sociological studies, we find the author's criticism of the naturalistic sociology which arose from this application. To him social development is partly conditioned by environment, because this development is the result of man's reaction on this environment, but the element in the situation by virtue of which development occurs is the human will. Since every reaction is thus a unique synthesis, one term of which is the human will, sociological laws cannot be discovered as are natural laws. Having pointed out what he feels to be the peculiarity of social phenomena, he is prepared to give a definition of society. Society is organization for defense against external nature. This organization, however, cannot have its origin in biological forces, because these lead not to organization, but to struggle and disunion. Not finding its source in biological forces this organization must have its origin in man as a "conscious being capable of opposing his desires and needs to the action of natural forces" (p. 137). It is need-

less to point out the question-begging in this argument. To support this definition of society M. Jankélévitch devotes his last chapter to a consideration of the moral consciousness of the individual. The chief element of this is the activity of the will. Moral ideals are not merely reflections of environment, but expressions of the attitude of the individual. Every act of approbation or disapprobation, *e. g.*, the disapprobation of other theories by naturalistic sociologists, is an expression of this individuality. Thus the chief thesis of the book is the affirmation of the fact of individual initiative both in the moral experience of each member of society and in the relation of society to external nature.

The psychological experience of every man, M. Jankélévitch admits, is affected by the environment in which each man finds himself, but the author is so busy asserting that the chief factor in this experience is the individual will that he gives no suggestion as to the details of this response. The nearest he comes to it is in the last half dozen pages, where he emphasizes the variability of human nature. If, moreover, we take the work on its own ground, it seems to miss much of the point of positivistic sociology, despite its valid criticisms of that view. Freely granting that in moral experience there are unique elements not reducible to laws strictly analogous to those of biology, this does not compel us to deny that the category of causality applies to these phenomena or to adopt M. Jankélévitch's 'category of action' (p. 168). To deny that one type of laws expresses a given group of phenomena does not prevent us from seeking unity for these phenomena under a different type of *laws*, in case we happen to be hungry for unity. Value judgments are not necessarily taboo for empirical investigation if we wish to bring them also under a causal system of linkage.

ROWLAND HAYNES.

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RELIGION.

The Philosophy of Religion. GEORGE TRUMBULL LADD. New York, Scribners, 1905. 2 vols.; pp. 616, 590.

This statement summarizes some discussions in the first volume dealing with psychological and social aspects of religion. The standpoint of the author is that there is a distinct, radical difference between the psychology and the philosophy of religion. Anthropology, comparative religion and psychology furnish important material for the use of philosophy, but the latter is a separate sphere. The peculiar element in religion which requires more than a scientific treatment is

the 'ontological consciousness.' This appears in the lowest known forms of human life and it is the mark which distinguishes man from the lower animals. Religion is universal because all men are religious! (P. 128.) Not only is it observed that all men have some religious belief and form of religious cult, but the "great religious ideas and truths lie everywhere dormant, or rather vital but undeveloped, in the lower strata of human religious life" (p. 126).

The treatment of the origin of religion proceeds from this presupposition. It is impossible to reduce the earliest forms of religion to anything more ultimate than a 'vague and unreflecting Spiritism.' This term does not designate a definite species of religious beliefs and practices, but the pervasive 'spiritizing tendency' found in every form of so-called primitive religion. Shamanism, Fetishism, Totemism, Theriolatry and Magic are only different manifestations of spiritism. None of the claims that any one of these is the original form can be substantiated (p. 92). It is impossible to know anything about 'primitive man' for he is a 'pure fiction.' In its earliest historical forms religion appears 'as an endowment or possession rather than as an evolution or new achievement.' It is forever impossible to discover when and how man began to be religious (p. 150). Slight consideration is given the theory that religion originated in ceremonials and rites. Such practices may indeed change from a non-religious to a religious character and the reverse, but this is no account of the origin of religious ideas themselves. "The fact, in most of these cases, is either that the rites themselves were originally derived from religious ideas; or else that, having some utilitarian or social origin, they have become incidentally connected with religious ideas, as all forms of social expression are ever ready to become" (p. 141).

Religion originates in the religious nature of man, and "it is man in his entirety, who is the maker of religion." "Without his metaphysical nature, his ontological consciousness, man would neither be scientific nor religious." "The lower impulsive and emotional stirrings solicit or impel him to be religious. His social instincts or more intelligent social desires and aims coöperate in the same results" (p. 263). The variations in religions are due in part to the variations in the psychical life of individuals and of the race, and also to the physical environment. Among the impulses involved in this psychical life are mentioned self-preservation, fear, dependence, altruistic and social feelings and intellectual curiosity. The social feelings are 'called forth' by worship of ancestors and the tribal gods. The communal feast is a prominent factor also. The sexual emotion of love, however,

does not become a source of religion or develop into a truly religious love (p. 292). "The erotic emotions, even in their most mystical and disguised form, have tended rather in the direction of degradation than of elevation" (p. 296). On the side of the physical environment the evidence is clear. "A tiger-god cannot exist where there are no tigers; nor can the palm claim worship where it is not known as a significant form of plant life" (p. 165). Where storms are impressive and practically important there storm-gods are found. Clan-gods are superseded by tutelary or local divinities when the nomadic clans settle in a particular locality. Changes of the social and political order also combine with geographical and ethnographical conditions to produce variation. The conceptions of the deities are often determined by the organization of the family, the divinity being a god or goddess according as descent is reckoned through the father or the mother (pp. 165 ff).

The relation of religion to industry, politics, science, art and morality is that of the most complex interaction. They are all made by man, 'they are the constructions of his active Self-hood' (p. 374). These reactions seem, however, to be conceived as more or less external and superficial. For example, the celebration, as religious festivities, of the various processes and stages of agriculture — the ploughing of the fields, the sowing of the seed, the harvest-home, the gathering of the vintage — 'imparts courage and cheerfulness to this form of human industry' (p. 395). Or religion, by inspiring and fostering a contempt for wealth, may discourage or greatly restrict the industrial development of any community. The distinctions between religion and politics, which become clear in developed society, seem to be read back into the earliest stages of human life, and their essential identity is described as a 'subtle, profound' relation (p. 398). The same impression is made by the discussion of the relation of art and religion and of morality and religion. They are discussed with reference to the manner in which both employ the creative imagination, share certain forms of feeling and employ intuitive processes. "Morality and religion are psychologically united so that they can never exist apart, and yet are not to be identified" (p. 460).

In the treatment of 'The Religious Community' the *a priori* and ontological conception of the religious principle becomes particularly conspicuous. Here, if anywhere, one would expect to find the recognition of the vital relation of the religious and the social consciousness. It is rather surprising, therefore, to read that the religious community proceeds 'as a spontaneous yet logical process from the religious belief itself' (p. 565). This intellectualistic interpretation of the social bond

is applied even to primitive society: "The primitive organization of the religious community is thus bound together by the necessity of coöperating in religious services, for their mutual advantage and under the belief that this advantage can best be secured by the patronage of the gods" (p. 566). A more convincing suggestion of the nature of the social tie of religious communities is given in the reference to the fact that in primitive society "almost anything may be made a matter of important religious service, in the well-doing and success of which the entire community have an interest, and in some sort, a share," as in kindling a fire, building a boat, or a dwelling, planting and gathering crops, going to war and honoring their heroes. In the treatment of the individuality of religion, its ontological character is still more clearly stated. "It is only in the reality of the living experience of the Individual Self that the Universal and Absolute becomes known and believed in or dimly apprehended as felt" (p. 595). The impression increases throughout the treatment of the subject that the social aspects of religion are taken as phenomenal and that the ontological and metaphysical presuppositions are firmly maintained, without being in the least endangered by a thoroughly genetic and social consideration.

E. S. AMES.

UNIVERSITY OF CHICAGO.

PSYCHOLOGY OF GROUPS, RACES, PEOPLES.

A Study of British Genius. HAVELOCK ELLIS. London, Hurst and Blacklett, 1904. Pp. xiv + 300.

The chief source of data for this interesting book was the Dictionary of National Biography, the sixty-six volumes of which contain biographical accounts of some thirty thousand persons. From this number 1030 persons of preëminent intellectual ability, 975 men and 55 women, were selected by the author to serve as the *corpora vilia* of this study. The material thus made available is presented and discussed under the following heads: Nationality and Race, Social Class, Heredity and Parentage, Childhood and Youth, Marriage and Family, Duration of Life, Pathology, Stature, Pigmentation, and Other Characteristics.

In the chapter on Nationality and Race, which occupies nearly one fourth of the book, the author pursues the problem of localizing the distribution of genius in the larger political divisions of the United Kingdom. In England, for example, three foci of genius-producing localities are discriminated, the East Anglican, the Welsh border, and the southwestern region. North of these lies the Anglo-

Danish district, which although less frequently the origin of genius, is the habitat of peculiar race characteristics, contributing especially the trait of marked independence of thought and action. London, though lying well within the fringe of the east Anglican focus exhibits to an extreme degree deficiency in the production of parents of men of genius. Mr. Ellis presents the novel view that it is not difficult to detect a distinct character in English scientific genius according as it springs from the Anglo-Danish district or the East Anglican focus or the southwest focus. (The Welsh border focus is the home of poetic and artistic types of genius rather than of the scientific type.) "The Anglo-Dane appears to possess an aptitude for mathematics which is not shared by the native of any other English district as a whole, and it is in the exact sciences that the Anglo-Dane triumphs. (The mathematical tendencies of Cambridge are due to the fact that Cambridge drains the ability of nearly the whole Anglo-Danish district.)" (P. 69.) Newton is cited as the supreme figure of Anglo-Danish science. "The East Anglican is in scientific matters drawn to the concrete, and shows little or no mathematical aptitude. He is a natural historian in the widest sense. He delights in the patient collection of facts, and seeks to sift, describe, coördinate, and classify them. In his hands science becomes almost an art." Here belong Gilbert, Ray, and Francis Bacon. The scientific genius of the southwest focus, quite distinct from either of the other two foci, is characterized by a marked interest in mechanics, by the physiological temper, by the inventive turn of mind. Here belong Harvey, Hales, and Thomas Young; also the great scientific physicians, Sydenham and Glisson. Huxley is here the typical figure.

As to the 'social classes' to which the 1,030 belong, Mr. Ellis finds that the ability-producing classes are in direct ratio to their height in the social hierarchy and in inverse ratio to their size. Thus a very large proportion of the list is produced by the comparatively small classes of clergy and those of 'good families,' whereas few are produced by the comparatively large classes of laborers and artisans. The commercial and professional classes occupy a middle ground. "It seems clear that, taking English history as a whole, the conditions of rural life have, from the present point of view, produced the best stocks. The minor aristocracy and the clergy — the 'gentlemen' of England — living on the soil in the open air, in a life of independence at once laborious and leisurely, have been able to give their children good opportunities for development, while at the same time they have not been able to dispense them from the necessity of work" (p. 92).

The chapter on heredity and parentage tends to substantiate the thesis of the well-known work of Galton on *Hereditary Genius*. A considerable number of the 1,030 eminent persons studied are found to have been closely related — 41 groups of two or three individuals in each group, to say nothing of a very large number of instances in which persons in the list were nearly related to others of eminence who had not reached a degree of distinction entitling them to appear in the list. Mr. Ellis estimates roughly that in the case of at least forty per cent. of the entire list of 1,030 one or the other of the parents displayed more than average intellectual ability.

From the standpoint of psychology, particularly individual psychology, the chapter on Childhood and Youth is the most suggestive in the book, on account of the method of interpretation, as well as on account of the data presented. A marked frequency in constitutional delicacy in infancy and early life is noted, followed, however, in many instances by a tendency to become unusually robust or enduring in later life. The subject of precocity is discussed with uncommon discrimination, and the usual gross application of the term meets with deserved rebuke. Although many of those in the list selected were set down by their biographers as precocious (292 out of 1030) and only 44 are mentioned as non-precocious, the term is almost meaningless without further specification. The usual criterion of precocity — preëminence in school work — sometimes also characterizes mediocre minds. Again, many who early became indifferent to school work, because absorbed in their own lines of mental activity are, Mr. Ellis fairly holds, just as 'precocious' as others who seem to enjoy a monopoly of the term. Then there is a small but interesting group of cases whose mental development is first retarded and then accelerated.

In discussing the 'Duration of Life' of men of genius the author briefly punctures the logic of the inference, seemingly based on statistics, arguing longevity. Such an inference leaves out of account the fact that fame comes rather late in life, if it comes at all. Eminent men of genius "live for a long time for the excellent reason that they must live a long time or they will never become eminent."

The reader who half suspects the author of aristocratic leanings is likely to have his suspicions confirmed in the chapter on Pathology, in which the author descants for several pages on the prevalent tendency of gout, that 'disease of good reputation,' to be the most commonly mentioned affliction of the intellectually preëminent. Gout vies with consumption in the pathology of genius. Victims of the latter, "with their febrile activities, their restless versatility, their quick

sensitiveness to impressions, often appear the very type of genius, but it is a somewhat feminine order of genius. The genius of the gouty group is emphatically masculine; profoundly original; these men show a massive and patient energy which proceeds 'without rest,' it may be, but also 'without haste,' until it has dominated its task and solved its problem" (p. 182).

The book as a whole leaves one with the strong impression that the statistical method is not a final method, not a method of conclusions, but a preliminary method, a method of bringing to light new and interesting data, of suggesting, instead of solving, further problems. In the preface Mr. Ellis more than implies that this is but the first in a series of volumes bearing on the psychological and anthropological characteristics of genius and based on material that has been accumulating under his hands for many years.

WILLARD C. GORE.

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The Sociology of Secrecy and of Secret Societies. GEORGE SIMMEL.
American Journal of Sociology, January, 1906.

The personal unities which we construct out of the data furnished us by the individuals of our social environment are in the nature of the case fragmentary and reveal only a small portion of the real selves. But in so far as our hypothetical personalities react as we expect no necessity arises for a reconstruction based upon a wider synthesis of characteristics. The merchant need only know that his customer is solvent and reliable in a business way. The other contents of his life may well be shrouded in secrecy. In the life of every individual there is a very large content which never appears at all in the social relations, or at best, appears only to one or more individuals. The secret of personality is more or less sociologically restricted, depending upon the relationship. Thus friendship and marriage comprehend a greater content of the personality than a mere business relation.

The secret society seizes upon only those aspects of the personality which are relevant to its purposes. "The organization for a special purpose (Zweckverband) is the peculiarly discreet sociological formation; its members are in psychological respects anonymous; and, in order to form the combination, they need to know of each other only *that* they form it" (p. 449). The justification of secrecy as a social technique for the furtherance of certain specific purposes is not the point at issue for sociological theory.—"Secrecy is a universal sociological form, which, as such, has nothing to do with the moral valuation of its contents" (p. 463).

The secret society, in contradistinction to other sociological structures, is a purely purposive and derivative construction, which does not rest upon an instinctive basis. It arises only in a society with evolved methods of conduct. It does not involve a reconstruction of these methods of conduct for the furtherance of the general welfare of society, but rather for the sake of its own particular purposes, which may indeed be quite militant to approved social standards. The secret organization serves to individuate its members or set them over against the rest of society. The psychological motive to secrecy is therefore always an aristocratic or individualistic one. The leaders among primitive peoples shroud themselves in secrecy whereby their authority is accentuated in the popular mind. In modern times secret political and official doings possess much the same glamor for the masses.

Although the secret society seizes upon a fragmentary aspect of the personality of its members, yet it 'commits them to more reciprocal obligations than the same purpose would within an open society' (p. 481). These obligations are psychologically greatly accentuated by the objective technique of an elaborate ritual. The purpose of the secret society may be militant to general social control and, as such, anarchic, but the very inward necessity for a vicarious organization expresses itself here often under the most fantastic forms. Often a centralization of authority takes place within the secret society which goes far beyond that of the outside world. This centralization and absoluteness of power carries with it a de-personalizing tendency. We have indeed what amounts to a merging of personality in the interest and purpose to be subserved — "the object mold has become master over the personal in membership and in activity" (p. 495). "Bismarck speaks in his memoirs of a widely ramified pederastic organization in Berlin, which came under his observation as a young judicial officer; and he emphasizes 'the equalizing effect of coöperative practice of the forbidden vice through all social strata.'" The highest expression of this de-personalizing tendency of secrecy is to be found in irresponsibility. The individual is not personally responsible for his acts so far as they relate to the doings of the organization. Examples of this are to be found in all secret legislation and in the secret work of all sorts of committees. Here the personality is completely merged in an extra-individual motive.

FREDERICK HORNSTEIN.

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Beitrag zur vergleichenden Rassen-Psychiatrie. ALEXANDER PILCZ. Leipzig and Vienna, F. Deuticke, 1906. New York, G. E. Stechert & Co. Pp. 44. M. 2.50.

Dr. Pilcz has studied the material from 2886 cases of mental disease at the Vienna Clinic from June 1900 to July 1905, and has added to these a study of the available material concerning mental disease in other than European countries. At Vienna the cases were chiefly from four races—Germans, Northern Slavs (Czechs, Poles, etc.), Hungarians and Jews. The tables show interesting variations in the frequency of the different types of mental disease. Especially striking are the differences in the diseases due to alcoholism. These are by far the more numerous in the north Slavs, followed by Germans and Hungarians. Among the Jews they occur scarcely at all. On the other hand *dementia præcox* is most frequent among the Jews, and the paralytic dementia is nearly as frequent among the Jews as with the Hungarians, who lead in this list. This is true of both men and women. In the cases of paranoia, on the other hand, the Jews lead among the men, but have the smallest percentage among the women. An explanation for the latter the author thinks may possibly be found in the fact that in Jewish women an unusually rapid transition occurs from paranoia to dementia. As to the type of hallucinations, the author ventures only the comparison that the predominantly combining forms seem to be more frequent with the Germans, while the fantastic types with very abundant sense illusions, especially of the ‘common feeling,’ are more common among the Slavs and Hungarians. Under the head of mania and melancholy the conditions characterized by depression prevail among the Germans of both sexes, as contrasted with those of exaltation; among the Jews and north Slavs this is reversed. The Germans of both sexes lead in cases of depression, while in those of mania they are below the North Slavs and Jews.

In addition to the above, the following general statements are made, based upon the reports of other cases as well as upon the author's own observations:

1. The Scandinavian-Germanic stocks show the greatest tendency toward conditions of depression; suicide is observed most frequently among them.
2. The Jews furnish the greatest contingent for those cases of mental disturbance due to hereditary degeneration.
3. Alcoholism and its attendant mental diseases occur conspicuously among the European peoples. North Slavs and Germans have the preëminence, the Romanic races show more moderation.

Among races outside of Europe alcoholism does not seem to have the same results in psychoses as with Europeans; notably the typical delirium is much less frequent.

4. There are now scarcely any mental disturbances of the hysteric type which appear endemically and epidemically. Such as were formerly known in Europe we now find among the lower races, which seem in general more disposed to hysteria and epilepsy.

5. Progressive paralysis in its frightful frequency is a melancholy specialty of Europe. Outside of Europe it is very infrequent, in spite of the enormous spread of syphilis in many places. That civilization, however, when added as a second factor, is not in itself adequate to account for the European frequency, is shown by the fact that the Japanese have very little paralysis.

Grundzüge des modernen Seelenlebens in Deutschland. KARL LAMPRECHT. *Annalen der Naturphilosophie*, December, 1905.

The past century and a half may be characterized as a subjectivistic period, as the preceding three centuries may be called the age of individualism. Freedom of the emotional and volitional, as well as of the intellectual life; recognition of individual differences, and of the variety in the individual; reversal of æsthetic standpoint, so that the individual regards himself as subject, not object of æsthetic contemplation, and hence simplifies dress and mode; self-observation and expression in literature, as feeling for nature; interest in man and in psychology and sociology as human sciences; — these are some of the subjectivistic tendencies. The negative or even pathological phases of subjectivism show themselves in discontent and *Weltschmerz*, which are only overcome by a greater self-control, and especially by stronger development of the common social feelings. The subjectivistic personality was the basal element of the new world, but this world must be socially formed if it was to be spiritually free, and open for the mind to traverse. A new friendship, cosmopolitanism, political, social and economic equality of all were some of these new common feelings. Democracy in social spheres has indeed suffered a seeming check in the cry for giant-natures, and a weariness of the *Vielzuvielen*, but this signifies only a transition to a new subjectivism, a new democracy. Nationalism no longer appears in so great a degree the highest thinkable channel of social evolution.

J. H. T.

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- Proceedings of Aristotelian Society, N. S., Vol. VI (1905-6).* London, Williams & Norgate, 1906. Pp. 399.
- Le Divin, expériences et hypothèses.* M. HÉBERT. Paris, Alcan, 1907 (for 1906). Pp. 316.
- La vie sociale et l'éducation.* J. DELVAILLE. Paris, Alcan, 1907 (for 1906). Pp. viii + 199.
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- Le langage musical et ses troubles hystériques.* Paris, Alcan, 1907 (for 1906). Pp. vi + 208.
- Idealistic Construction of Experience.* J. B. BAILLIE. London and New York, Macmillans, 1906. Pp. xx + 344.
- Savage Childhood, a Study of Kafir Children.* D. KIDD. Profusely illustrated. London, Black, 1906. Pp. 314.

NOTES AND NEWS.

THE American Psychological Association will meet, in affiliation with the American Association for the Advancement of Science and the American Society of Naturalists, at Columbia University, New York City, on December 27 to 29. The American Philosophical Association will meet at the same time and place and participate in the same affiliation.

THE second meeting of the Southern Society for Philosophy and Psychology will be held in Montgomery, Alabama, in connection with the Southern Educational Association, on December 27 to 29. Those expecting to be present are requested to communicate with the Secretary, Professor E. F. Buchner, University, Ala.

WE have received the announcement of a new journal, *Revue des Sciences Philosophiques et Théologiques*, to be edited by a 'group of Dominican professors,' and published quarterly by the *Revue*, Le Saulchoir, à Kain, Belgium (fr. 12; postal union fr. 14).

THE Science Press announces that hereafter the series known as *Archives of Philosophy, Psychology and Scientific Methods* will be conducted as two series, to be known as *Archives of Philosophy* and *Archives of Psychology*. The latter will be under the editorial direction of Professor R. S. Woodworth, of Columbia University.

WE regret to note the death of Professor Carlo Cantoni, of the University of Pavia, founder and editor of the *Rivista Filosofica*. It is announced that Professor E. Juvalta will conduct the *Rivista* till the completion of the current volume.

MR. C. F. SANDERS has been appointed instructor in psychology at Pennsylvania College, Gettysburg, Pa.

The following are taken from the press:

PROFESSOR E. H. SNEATH has been granted a second year's leave of absence from Yale University. Dr. Paul Monroe, professor of the history of education at Teachers College, Columbia University, will have charge of one of his courses.

CHAS. HUGHES JOHNSON, Ph.D. (Harvard), last year professor of psychology at East Stroudsburg State Normal School, is now instructor in philosophy and psychology at Dartmouth College. Some psychological apparatus is being secured for the college, which, it is hoped, may form the nucleus for a psychological laboratory in the near future.

DR. JOHN FREDERICK SHEPARD, formerly assistant in psychology at the University of Michigan, has been promoted to be an instructor.

DR. SHEPHERD IVORY FRANZ, pathological physiologist at the McLean Hospital, Waverly, Mass., has been appointed professor of physiology at George Washington University.

IN the early part of October the Yale Association of Japan gave a reception in honor of Professor G. T. Ladd, who is now in Tokyo.

THE fiftieth anniversary of the induction of Emeritus Professor Campbell Fraser to the chair of logic and metaphysics in the University of Edinburgh was celebrated on November 6. Addresses were presented to Professor Fraser, who is now in his 88th year, by the Senatus and by his former honors graduates.

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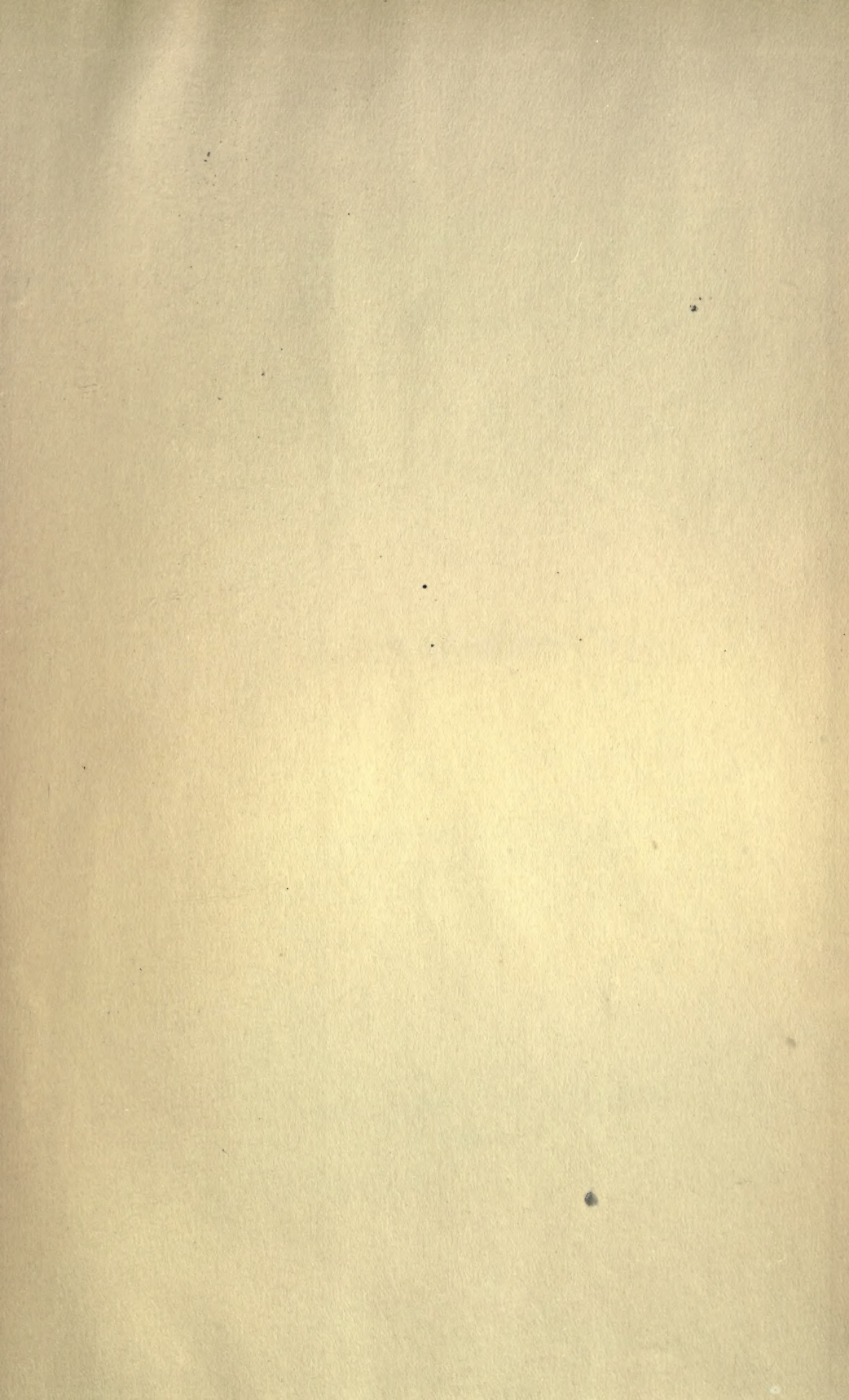
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