

exist only as products of the psychic syntheses, and imply a pre-existing consciousness capable of forming such syntheses? But is not this falling back into that idealistic denial of 'objects' from which we were told psychology (like the other sciences) must provisionally make abstraction? And does it not require for its explanation a complete statement of the idealistic philosophy of Wundt? And as I said in the beginning, can we be sure that it means anything very different from Münsterberg's admission that the fact of consciousness, as a whole, has no counterpart in the physical world? Thus while we all agree in deprecating the contamination of psychology with metaphysics, psychological literature is largely occupied with controversy over metaphysical conceptions introduced by the back door.

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ATTENTION AS INTENSIFYING SENSATION.

Dr. Münsterberg begins a paper on this subject (*PSYCHOLOGICAL REVIEW*, vol. 1, p. 39) by stating that the popular and generally received view is that attention does intensify our sensations. Common introspection certainly avers that attention as sensing effort generally, and within certain limits, is rewarded by increase of sensation. If I wish to hear better I listen harder; that is, I raise the sensation to stronger intensity by attending. I look for a dim star, I find it, and, increasing my cognitive effort, it appears brighter up to a certain maximum dependent on my state of health, training, etc. The keenest, most effortful glance gets the strongest sensation of a given light stimulus.

Fechner's observation that gray paper does not appear lighter the harder we look at it, does not destroy the fact that the more intensely we sense gray, the stronger is our sensation of it. And it must also be said that a dark object may with greater attention be discerned as gray, and dark gray as light gray; that is, where attention means not closeness of scrutiny, which often tends to close the eyes, but a wide open-eyed attempt to get full impression.

Further, the general theory of evolution leads us to suppose that only by attention has sensing and perceiving arisen and been developed in the struggle of life. It is by trying hard that the animal sees, and the harder it tries the more intensely it sees. Originally, then, a sensation becomes intense by attention as intensifying act, the sensing act is achieved and developed to various intensities only by and as cognitive effort. How is it, then, that an intense sound

gives us involuntarily, without the least effort, an intense sensation? This, we answer, is due to the efforts of ancestors for ages who at first were unable to hear the loudest sounds, but gradually achieved the hearing them, and hearing them intensely, and this tendency, perfected and integrated as useful in the struggle of existence, has been transmitted to us, in whom it acts automatically.

We believe, then, that if struggle or *nisus* is the fundamental power in the evolution of consciousness, then consciousness intensities of all kinds must be traced to attention; and so in the evolution of sense, attention is practically synonymous with sensation intensity. This does not deny that in certain cases of thoroughly integrated and automatic sensation cognitive volition when applied may be a hindrance, may reduce intensity and effectiveness of the sensation which always appear merely as a *given*. But this is of minor moment in a general discussion of attention. That we hear, and hear intensely, without listening, is because our innumerable ancestors listened, and listened hard. And so if future generations are to have certain forms and intensities of sensation *come* to them, it will be by our attention.

It may be evident, but it deserves emphasis, that we do not mean by sensation-attention, attending *to* a sensation. It is sufficient to know that where we now have intense sensations without intense attention, and without attention at all, this is not original and natural method, and that even now in general, when we wish to intensify our sensations, we exert cognitive effort, and with success. Expressed physiologically, it is the doctrine that function determines organ; that we see, not because we have eyes, but we have eyes because we see. The sensing effort has developed the eye, and by visual effort we now open the eyes wide and accommodate them, etc., thus securing intensity of sensation. Attending to a sensation is weakening to the sensation attended to. Thus, when absorbed in listening to music, some one asks me, 'Do you hear that false note?' the attention to the sensation as such weakens or destroys the sensation. Sensation-attention is not for us a consciousness outside of and directed to sensation, but sensing activity itself as cognitive effort. Nor is attention, as Mr. Shand implies, (*Mind*, Oct., 1894) a 'letting alone,' an isolating to see if a psychosis will strengthen, or will weaken and disappear. This hereditary spontaneous force of a cognition is the integrated result of past attentions, but is itself very different from attention as cognitive effort.

Believing, then, that sensation intensities are bound up with attention intensities as a general fact of mind, we were interested to

see how Dr. Münsterberg's experiments would bear on this law, to which he alludes in his opening remarks as the scope of his inquiry. However, we discover that it is only a certain kind of attention, expectant, and a certain kind of this, too much expectancy, that is really treated, with the result that sensations of light, sound, etc., are rendered less intense when we set our attention at too high a notch. The familiar experience of lifting falsely estimated weights is appealed to in a general way, but let us particularize. I see a two-pound wooden ball, which I take to be a ten-pound iron ball, and making muscular pre-adjustment, according to my misjudgment, it lifts 'as light as a feather;' I do not get the impression of a two-pound ball lifted with more just preparation or in a mere casual way. Thus sensations of weight may in intensity be inversely relative to the effort put forth. So if I am bid to look for a bright light or listen for a loud sound, and only slight stimuli actually occur, the sensations will be actually slighter in intensity than they would otherwise have been; the light does not seem so bright nor the sound so loud as when no pre-adjustment has been made. Now this result is not really 'unexpected,' but is quite the 'popular view.' We all know the answer which is commonly returned to those who realize certain sensations rather feebly, 'you set your hopes too high.'

But pre-adjustment may be too little as well as too much—a fact which Dr. Münsterberg does not notice—and the consequence is an undue increasing of intensity of sensation. When coming down stairs, and inadvertently taking two steps at a time, you have a peculiar abnormal increase of intensity of sensation, seeming to drop a very long distance, altogether disproportional to the actual distance, and this result is plainly owing to the wrong degree of pre-adjustment. Similarly for sensations of light, sound, etc., it is a common experience that under-adjustment means over-intensifying sensation. It is only when pre-conception and pre-adjustment are in a certain exact relation to stimuli that sensation occurs without abnormal heightening or lowering. It is well known that reaction-time is lessened by correct expectant attention.

The conditions and methods of the experiments call for some criticism. The agents were directed to have their attention 'fully' occupied with adding numbers. Now, adding is a process which is with most educated persons more or less automatic unless at top speed. But what is 'full' attention? Is it a scientifically determinable state, and one which can be induced as readily as securing air full of moisture at what we term saturation point? How can the experimenter be sure of attention at a certain degree? The inexact-

ness of experimental psychics as compared with physics is certainly great. The intensity of cognitive effort is neither easily discernible or measurable. However, we may say this, that attention at its strongest, is complete absorption of psychic capacity, and an agent in this state as regards adding effort would be entirely insensible to any stimuli. Further, full attention can only be reached by the full interest. When life for a wrecked sailor hangs on his seeing a certain beacon, then the intense interest is secured which assures intensest attention. But having, if possible, secured the highest attentions of several individuals, these attentions cannot be lumped together as identical in value. The tensile strength of iron bars of a given quality may be determined as equal, and the results used as a general value; but attention, as all mentality, has an individual equation. Again, it may be that the method of measuring intensity of sensation employed is the only feasible one, namely, judging intensity by the estimation the subject puts upon intensity of stimulus, still its inexactness is obvious. If a man says after lifting two rocks, one is twice as heavy as the other, are we thereby certain that one sensation was twice the intensity of the other, or may not the man judge also from other methods? At least the method ought not to be assumed without criticism and validation.

Further, Dr. Münsterberg finally explains attention as reducing intensity of sensation by feeling of strain. A tenseness of attention introduces a feeling of strain, which decreases the sensation felt. Sense of strain is undoubtedly divisive of consciousness, if with Dr. Münsterberg we interpret it as feeling of intensity. However, we do not gain anything by considering intensity of feeling as feeling of intensity. I have an intenser light sensation from the sun than from a candle, but if I say the intenser sensation is such by virtue of the greater feelings of tension, this means no more than that intensity of the sensation depends upon a sensation of an intense sensation, which latter intensity has to be explained, and so on. However, as I have pointed out, (*Mind*, XIV., p. 538) it is desirable to understand intensity not as a consciousness, but, like duration, as a quality. Every consciousness, including consciousness of intensity, has its intensity, which may or may not be felt or attended to. Strictly speaking, the intensity of my sensation—a feeling intensely—is never feeling of intensity, consciousness of intensity.

Still further, the 'chosen graduation of the stimuli' must be justified in the light of Weber's law, and the time intervals must also have their justification. The relation of change in time in attention and inattention and unattention to the problem of sensation inten-

sity must also be investigated if any satisfactory result is to be obtained. To get exact results in experimental psychology in general is then, I am persuaded, an enormously difficult task. The complexity of adult human consciousness is so great that it seems well nigh impossible to isolate the factors we are studying, and to secure identical reactions in a sufficiently large number of cases to prove a psychic law. Physical conditions are far more under our control than psychical, and are far easier to observe, and hence physical science has arrived at a *consensus* which is notably lacking in psychical. Essential preliminaries must first be settled before experimental psychology can really be fruitful, and the relation of attention to intensity of sensation requires far closer definition of subject and method than has yet been given it, if results of large scientific value are to be obtained.

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PLEASURE-PAIN AND EMOTION.

Serious and courteous criticism from the pen of a thinker, skilled in the subject of discussion, is certainly in all cases to be welcomed by an author, and I feel much gratification in reading Dr. Santayana's remarks upon my lately-published book¹ in the July number of this REVIEW.

There are one or two points raised in the review which I think it worth while to discuss.

In the first place, in the interest of psychological advance I must deprecate the implication of the opening paragraphs; viz.: that the writer of what aims to be a scientific discussion of psychological doctrine is no great sinner if he consider the claims of literary æsthetics in his exposition, where there is the slightest chance that the clearness and definiteness of his meaning may thereby suffer.

I regret much more than my critic can do that the book is so unattractive in its literary quality, but on the whole I do not feel confident that I could have made it more pleasing had I not deemed it of the utmost importance to aim at accuracy and to waive verbal preferences in favor of precision.

I am free to confess that the reading over and over again of my proofs has produced within me a deep-seated disgust with many phrases in the book, notably with the compound word *pleasure-pain*; but what authorized substitute could I have used in this case save the word

¹ Pain, Pleasure and Æsthetics.