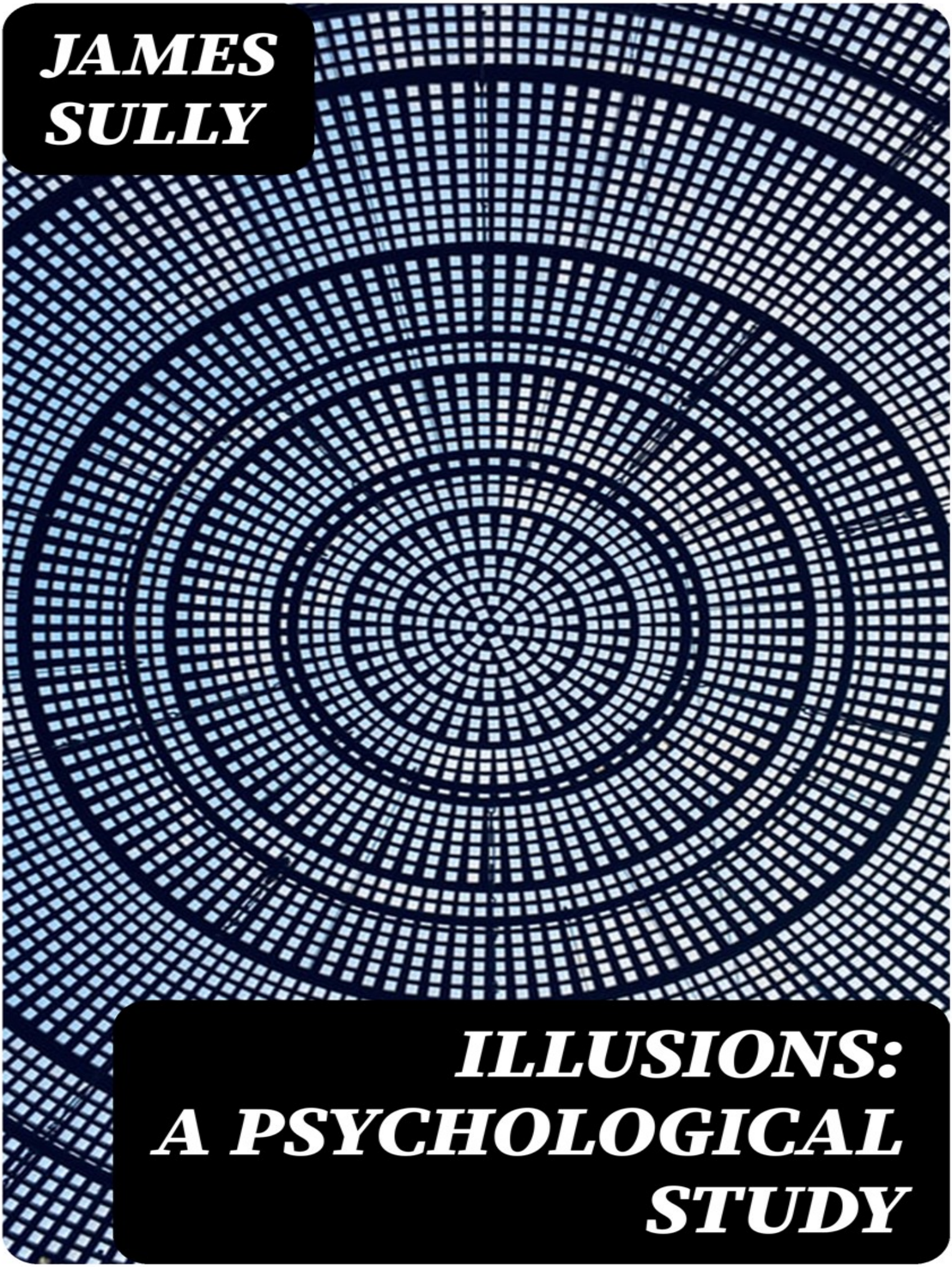
JAMES SULLY
ILLUSIONS: A PSYCHOLOGICAL STUDY

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PREFACE.

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The present volume takes a wide survey of the field of error, embracing in its view not only the illusions of sense dealt with in treatises on physiological optics, etc., but also other errors familiarly known as illusions, and resembling the former in their structure and mode of origin. I have throughout endeavoured to keep to a strictly scientific treatment, that is to say, the description and classification of acknowledged errors, and the explanation of these by a reference to their psychical and physical conditions. At the same time, I was not able, at the close of my exposition, to avoid pointing out how the psychology leads on to the philosophy of the subject. Some of the chapters were first roughly sketched out in articles published in magazines and reviews; but these have been not only greatly enlarged, but, to a considerable extent, rewritten.

J. S.

Hampstead, April, 1881.

CHAPTER I.

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THE STUDY OF ILLUSION.

Common sense, knowing nothing of fine distinctions, is wont to draw a sharp line between the region of illusion and that of sane intelligence. To be the victim of an illusion is, in the popular judgment, to be excluded from the category of rational men. The term at once calls up images of stunted figures with ill-developed brains, half-witted creatures, hardly distinguishable from the admittedly insane. And this way of thinking of illusion and its subjects is strengthened by one of the characteristic sentiments of our age. The nineteenth century intelligence plumes itself on having got at the bottom of mediæval visions and church miracles, and it is wont to commiserate the feeble minds that are still subject to these self-deceptions.

According to this view, illusion is something essentially abnormal and allied to insanity. And it would seem to follow that its nature and origin can be best studied by those whose speciality it is to observe the phenomena of abnormal life. Scientific procedure has in the main conformed to this distinction of common sense. The phenomena of illusion have ordinarily been investigated by alienists, that is to say, physicians who are brought face to face with their most striking forms in the mentally deranged.

While there are very good reasons for this treatment of illusion as a branch of mental pathology, it is by no means certain that it can be a complete and exhaustive one.

Notwithstanding the flattering supposition of common sense, that illusion is essentially an incident in abnormal life, the careful observer knows well enough that the case is far otherwise.

There is, indeed, a view of our race diametrically opposed to the flattering opinion referred to above, namely, the humiliating judgment that all men habitually err, or that illusion is to be regarded as the natural condition of mortals. This idea has found expression, not only in the cynical exclamation of the misanthropist that most men are fools, but also in the cry of despair that sometimes breaks from the weary searcher after absolute truth, and from the poet when impressed with the unreality of his early ideals.

Without adopting this very disparaging opinion of the intellectual condition of mankind, we must recognize the fact that most men are sometimes liable to illusion. Hardly anybody is always consistently sober and rational in his perceptions and beliefs. A momentary fatigue of the nerves, a little mental excitement, a relaxation of the effort of attention by which we continually take our bearings with respect to the real world about us, will produce just the same kind of confusion of reality and phantasm, which we observe in the insane. To give but an example: the play of fancy which leads to a detection of animal and other forms in clouds, is known to be an occupation of the insane, and is rightly made use of by Shakespeare as a mark of incipient mental aberration in Hamlet; and yet this very same occupation is quite natural to children, and to imaginative adults when they choose to throw the reins on the neck of their phantasy. Our luminous circle of rational perception is surrounded by a misty penumbra of illusion. Common sense itself may be said to admit this, since the greatest stickler for the enlightenment of our age will be found in practice to

accuse most of his acquaintance at some time or another of falling into illusion.

If illusion thus has its roots in ordinary mental life, the study of it would seem to belong to the physiology as much as to the pathology of mind. We may even go further, and say that in the analysis and explanation of illusion the psychologist may be expected to do more than the physician. If, on the one hand, the latter has the great privilege of observing the phenomena in their highest intensity, on the other hand, the former has the advantage of being familiar with the normal intellectual process which all illusion simulates or caricatures. To this it must be added that the physician is naturally disposed to look at illusion mainly, if not exclusively, on its practical side, that is, as a concomitant and symptom of cerebral disease, which it is needful to be able to recognize. The psychologist has a different interest in the subject, being specially concerned to understand the mental antecedents of illusion and its relation to accurate perception and belief. It is pretty evident, indeed, that the phenomena of illusion form a region common to the psychologist and the mental pathologist, and that the complete elucidation of the subject will need the co-operation of the two classes of investigator.

In the present volume an attempt will be made to work out the psychological side of the subject; that is to say, illusions will be viewed in their relation to the process of just and accurate perception. In the carrying out of this plan our principal attention will be given to the manifestations of the illusory impulse in normal life. At the same time, though no special acquaintance with the pathology of the subject will be laid claim to, frequent references will be made to the illusions of the insane. Indeed, it will be found that the two groups of phenomena—the illusions of the normal and of the abnormal condition—are so similar, and pass into one

another by such insensible gradations, that it is impossible to discuss the one apart from the other. The view of illusion which will be adopted in this work is that it constitutes a kind of border-land between perfectly sane and vigorous mental life and dementia.

And here at once there forces itself on our attention the question, What exactly is to be understood by the term "illusion"? In scientific works treating of the pathology of the subject, the word is confined to what are specially known as illusions of the senses, that is to say, to false or illusory perceptions. And there is very good reason for this limitation, since such illusions of the senses are the most palpable and striking symptoms of mental disease. In addition to this, it must be allowed that, to the ordinary reader, the term first of all calls up this same idea of a deception of the senses.

At the same time, popular usage has long since extended the term so as to include under it errors which do not counterfeit actual perceptions. We commonly speak of a man being under an illusion respecting himself when he has a ridiculously exaggerated view of his own importance, and in a similar way of a person being in a state of illusion with respect to the past when, through frailty of memory, he pictures it quite otherwise than it is certainly known to have been.

It will be found, I think, that there is a very good reason for this popular extension of the term. The errors just alluded to have this in common with illusions of sense, that they simulate the form of immediate or self-evident cognition. An idea held respecting ourselves or respecting our past history does not depend on any other piece of knowledge; in other words, is not adopted as the result of a process of reasoning. What I believe with reference to my past history, so far as I can myself recall it, I believe instantaneously and

immediately, without the intervention of any premise or reason. Similarly, our notions of ourselves are, for the most part, obtained apart from any process of inference. The view which a man takes of his own character or claims on society he is popularly supposed to receive intuitively by a mere act of internal observation. Such beliefs may not, indeed, have all the overpowering force which belongs to illusory perceptions, for the intuition of something by the senses is commonly looked on as the most immediate and irresistible kind of knowledge. Still, they must be said to come very near illusions of sense in the degree of their self-evident certainty.

Taking this view of illusion, we may provisionally define it as any species of error which counterfeits the form of immediate, self-evident, or intuitive knowledge, whether as sense-perception or otherwise. Whenever a thing is believed on its own evidence and not as a conclusion from something else, and the thing then believed is demonstrably wrong, there is an illusion. The term would thus appear to cover all varieties of error which are not recognized as fallacies or false inferences. If for the present we roughly divide all our knowledge into the two regions of primary or intuitive, and secondary or inferential knowledge, we see that illusion is false or spurious knowledge of the first kind, fallacy false or spurious knowledge of the second kind. At the same time, it is to be remembered that this division is only a very rough one. As will appear in the course of our investigation, the same error may be called either a fallacy or an illusion, according as we are thinking of its original mode of production or of the form which it finally assumes; and a thorough-going psychological analysis of error may discover that these two classes are at bottom very similar.

As we proceed, we shall, I think, find an ample justification for our definition. We shall see that such illusions as those

respecting ourselves or the past arise by very much the same mental processes as those which are discoverable in the production of illusory perceptions; and thus a complete psychology of the one class will, at the same time, contain the explanation of the other classes.

The reader is doubtless aware that philosophers have still further extended the idea of illusion by seeking to bring under it beliefs which the common sense of mankind has always adopted and never begun to suspect. Thus, according to the idealist, the popular notion (the existence of which Berkeley, however, denied) of an external world, existing in itself and in no wise dependent on our perceptions of it, resolves itself into a grand illusion of sense.

At the close of our study of illusions we shall return to this point. We shall there inquire into the connection between those illusions which are popularly recognized as such, and those which first come into view or appear to do so (for we must not yet assume that there are such) after a certain kind of philosophic reflection. And some attempt will be made to determine roughly how far the process of dissolving these substantial beliefs of mankind into airy phantasms may venture to go.

For the present, however, these so-called illusions in philosophy will be ignored. It is plain that illusion exists only in antithesis to real knowledge. This last must be assumed as something above all question. And a rough and provisional, though for our purpose sufficiently accurate, demarcation of the regions of the real and the illusory seems to coincide with the line which common sense draws between what all normal men agree in holding and what the individual holds, whether temporarily or permanently, in contradiction to this. For our present purpose the real is that which is true for all. Thus, though physical science may tell

us that there is nothing corresponding to our sensations of colour in the world of matter and motion which it conceives as surrounding us; yet, inasmuch as to all men endowed with the normal colour-sense the same material objects appear to have the same colour, we may speak of any such perception as practically true, marking it off from those plainly illusory perceptions which are due to some subjective cause, as, for example, fatigue of the retina.

To sum up: in treating of illusions we shall assume, what science as distinguished from philosophy is bound to assume, namely, that human experience is consistent; that men's perceptions and beliefs fall into a consensus. From this point of view illusion is seen to arise through some exceptional feature in the situation or condition of the individual, which, for the time, breaks the chain of intellectual solidarity which under ordinary circumstances binds the single member to the collective body. Whether the common experience which men thus obtain is rightly interpreted is a question which does not concern us here. For our present purpose, which is the determination and explanation of illusion as popularly understood, it is sufficient that there is this general consensus of belief, and this may provisionally be regarded as at least practically true.

CHAPTER II.

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THE CLASSIFICATION OF ILLUSIONS.

If illusion is the simulation of immediate knowledge, the most obvious mode of classifying illusions would appear to be according to the variety of the knowledge which they simulate.

Now, the popular psychology that floats about in the ordinary forms of language has long since distinguished certain kinds of unreasoned or uninferred knowledge. Of these the two best known are perception and memory. When I see an object before me, or when I recall an event in my past experience, I am supposed to grasp a piece of knowledge directly, to know something immediately, and not through the medium of something else. Yet I know differently in the two cases. In the first I know by what is called a presentative process, namely, that of sense-perception; in the second I know by a representative process, namely, that of reproduction, or on the evidence of memory. In the one case the object of cognition is present to my perceptive faculties; in the other it is recalled by the power of memory.

Scientific psychology tends, no doubt, to break down some of these popular distinctions. Just as the zoologist sometimes groups together varieties of animals which the unscientific eye would never think of connecting, so the psychologist may analyze mental operations which appear widely dissimilar to the popular mind, and reduce them to one fundamental process. Thus recent psychology draws no

sharp distinction between perception and recollection. It finds in both very much the same elements, though combined in a different way. Strictly speaking, indeed, perception must be defined as a presentative-representative operation. To the psychologist it comes to very much the same thing whether, for example, on a visit to Switzerland, our minds are occupied in *perceiving* the distance of a mountain or in *remembering* some pleasant excursion which we made to it on a former visit. In both cases there is a reinstatement of the past, a reproduction of earlier experience, a process of adding to a present impression a product of imagination—taking this word in its widest sense. In both cases the same laws of reproduction or association are illustrated.

Just as a deep and exhaustive analysis of the intellectual operations thus tends to identify their various forms as they are distinguished by the popular mind, so a thorough investigation of the flaws in these operations, that is to say, the counterfeits of knowledge, will probably lead to an identification of the essential mental process which underlies them. It is apparent, for example, that, whether a man *projects* some figment of his imagination into the external world, giving it, present material reality, or whether (if I may be allowed the term) he *retrojects* it into the dim region of the past, and takes it for a reality that has been he is committing substantially the same blunder. The source of the illusion in both cases is one and the same.

It might seem to follow from this that a scientific discussion of the subject would overlook the obvious distinction between illusions of perception and those of memory; that it would attend simply to differences in the mode of origination of the illusion, whatever its external form. Our next step, then, would appear to be to determine these differences in the mode of production.

That there are differences in the origin and source of illusion is a fact which has been fully recognized by those writers who have made a special study of sense-illusions. By these the term illusion is commonly employed in a narrow, technical sense, and opposed to hallucination. An illusion, it is said, must always have its starting-point in some actual impression, whereas a hallucination has no such basis. Thus it is an illusion when a man, under the action of terror, takes a stump of a tree, whitened by the moon's rays, for a ghost. It is a hallucination when an imaginative person so vividly pictures to himself the form of some absent friend that, for the moment, he fancies himself actually beholding him. Illusion is thus a partial displacement of external fact by a fiction of the imagination, while hallucination is a total displacement.

This distinction, which has been adopted by the majority of recent alienists[1], is a valuable one, and must not be lost sight of here. It would seem, from a psychological point of view, to be an important circumstance in the genesis of a false perception whether the intellectual process sets out from within or from without. And it will be found, moreover, that this distinction may be applied to all the varieties of error which I propose to consider. Thus, for example, it will be seen further on that a false recollection may set out either from the idea of some actual past occurrence or from a present product of the imagination.

It is to be observed, however, that the line of separation between illusion and hallucination, as thus defined, is a very narrow one. In by far the largest number of hallucinations it is impossible to prove that there is no modicum of external agency co-operating in the production of the effect. It is presumable, indeed, that many, if not all, hallucinations have such a basis of fact. Thus, the madman who projects his internal thoughts outwards in the shape of external

voices may, for aught we know, be prompted to do so in part by faint impressions coming from the ear, the result of those slight stimulations to which the organ is always exposed, even in profound silence, and which in his case assume an exaggerated intensity. And even if it is clearly made out that there are hallucinations in the strict sense, that is to say, false perceptions which are wholly due to internal causes, it must be conceded that illusion shades off into hallucination by steps which it is impossible for science to mark. In many cases it must be left an open question whether the error is to be classed as an illusion or as a hallucination.[2]

For these reasons, I think it best not to make the distinction between illusion and hallucination the leading principle of my classification. However important psychologically, it does not lend itself to this purpose. The distinction must be kept in view and illustrated as far as possible. Accordingly, while in general following popular usage and employing the term illusion as the generic name, I shall, when convenient, recognize the narrow and technical sense of the term as answering to a species co-ordinate with hallucination.

Departing, then, from what might seem the ideally best order of exposition, I propose, after all, to set out with the simple popular scheme of faculties already referred to. Even if they are, psychologically considered, identical operations, perception and memory are in general sufficiently marked off by a speciality in the form of the operation. Thus, while memory is the reproduction of something with a special reference of consciousness to its past existence, perception is the reproduction of something with a special reference to its present existence as a part of the presented object. In other words, though largely *representative* when viewed as to its origin, perception is *presentative* in relation to the object which is supposed to be immediately present to the

mind at the moment.[3] Hence the convenience of recognizing the popular classification, and of making it our starting-point in the present case.

All knowledge which has any appearance of being directly reached, immediate, or self-evident, that is to say, of not being inferred from other knowledge, may be divided into four principal varieties: Internal Perception or Introspection of the mind's own feelings; External Perception; Memory; and Belief, in so far as it simulates the form of direct knowledge. The first is illustrated in a man's consciousness of a present feeling of pain or pleasure. The second and the third kinds have already been spoken of, and are too familiar to require illustration. It is only needful to remark here that, under perception, or rather in close conjunction with it, I purpose dealing with the knowledge of other's feelings, in so far as this assumes the aspect of immediate knowledge. The term belief is here used to include expectations and any other kinds of conviction that do not fall under one of the other heads. An instance of a seemingly immediate belief would be a prophetic prevision of a coming disaster, or a man's unreasoned persuasion as to his own powers of performing a difficult task.

It is, indeed, said by many thinkers that there are no legitimate immediate beliefs; that all our expectations and other convictions about things, in so far as they are sound, must repose on other genuinely immediate knowledge, more particularly sense-perception and memory. This difficult question need not be discussed here. It is allowed by all that there is a multitude of beliefs which we hold tenaciously and on which we are ready to act, which, to the mature mind, wear the appearance of intuitive truths, owing their cogency to nothing beyond themselves. A man's belief in his own merits, however it may have been first obtained, is as immediately assured to him as his recognition of a real

object in the act of sense-perception. It may be added that many of our every-day working beliefs about the world in which we live, though presumably derived from memory and perception, tend to lose all traces of their origin, and to simulate the aspect of intuitions. Thus the proposition that logicians are in the habit of pressing on our attention, that "Men are mortal," seems, on the face of it, to common sense to be something very like a self-evident truth, not depending on any particular facts of experience.

In calling these four forms of cognition immediate, I must not, however, be supposed to be placing them on the same logical level. It is plain, indeed, to a reflective mind that, though each may be called immediate in this superficial sense, there are perceptible differences in the degree of their immediacy. Thus it is manifest, after a moment's reflection, that expectation, so far as it is just, is not primarily immediate in the sense in which purely presentative knowledge is so, since it can be shown to follow from something else. So a general proposition, though through familiarity and innumerable illustrations it has acquired a self-evident character, is seen with a very little inspection to be less fundamentally and essentially so than the proposition, "I am now feeling pain;" and it will be found that even with respect to memory, when the remembered event is at all remote, the process of cognition approximates to a mediate operation, namely, one of inference. What the relative values of these different kinds of immediate knowledge are is a point which will have to be touched on at the end of our study. Here it must suffice to warn the reader against the supposition that this value is assumed to be identical.

It might seem at a first glance to follow from this four-fold scheme of immediate or quasi-immediate knowledge that there are four varieties of illusion. And this is true in the

sense that these four heads cover all the main varieties of illusion. If there are only four varieties of knowledge which can lay any claim to be considered immediate, it must be that every illusion will simulate the form of one of these varieties, and so be referable to the corresponding division.

But though there are conceivably these four species of illusion, it does not follow that there are any actual instances of each class forthcoming. This we cannot determine till we have investigated the nature and origin of illusory error. For example, it might be found that introspection, or the immediate inspection of our own feelings or mental states, does not supply the conditions necessary to the production of such error. And, indeed, it is probable that most persons, antecedently to inquiry, would be disposed to say that to fall into error in the observation of what is actually going on in our own minds is impossible.

With the exception of this first division, however, this scheme may easily be seen to answer to actual phenomena. That there are illusions of perception is obvious, since it is to the errors of sense that the term illusion has most frequently been confined. It is hardly less evident that there are illusions of memory. The peculiar difficulty of distinguishing between a past real event and a mere phantom of the imagination, illustrated in the exclamation, "I either saw it or dreamt it," sufficiently shows that memory is liable to be imposed on. Finally, it is agreed on by all that the beliefs we are wont to regard as self-evident are sometimes erroneous. When, for example, an imaginative woman says she knows, by mere intuition, that something interesting is going to happen, say the arrival of a favourite friend, she is plainly running the risk of being self-deluded. So, too, a man's estimate of himself, however valid for him, may turn out to be flagrantly false.

In the following discussion of the subject I shall depart from the above order in so far as to set out with illusions of sense-perception. These are well ascertained, forming, indeed, the best-marked variety. And the explanation of these has been carried much further than that of the others. Hence, according to the rule to proceed from the known to the unknown, there will be an obvious convenience in examining these first of all. After having done this, we shall be in a position to inquire whether there is anything analogous in the region of introspection or internal perception. Our study of the errors of sense-perception will, moreover, prove the best preparation for an inquiry into the nature and mode of production of the remaining two varieties.[4]

I would add that, in close connection with the first division, illusions of perception, I shall treat the subtle and complicated phenomena of dreams. Although containing elements which ought, according to strictness, to be brought under one of the other heads, they are, as their common appellation, "visions," shows, largely simulations of external, and more especially visual, perception.

Dreams are no doubt sharply marked off from illusions of sense-perception by a number of special circumstances. Indeed, it may be thought that they cannot be adequately treated in a work that aims primarily at investigating the illusions of normal life, and should rather be left to those who make the pathological side of the subject their special study. Yet it may, perhaps, be said that in a wide sense dreams are a feature of normal life. And, however this be, they have quite enough in common with other illusions of perception to justify us in dealing with them in close connection with these.

CHAPTER III.

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ILLUSIONS OF PERCEPTION: GENERAL.

The errors with which we shall be concerned in this chapter are those which are commonly denoted by the term illusion, that is to say, those of sense. They are sometimes called deceptions of the senses; but this is a somewhat loose expression, suggesting that we can be deceived as to sensation itself, though, as we shall see later on, this is only true in a very restricted meaning of the phrase. To speak correctly, sense-illusions must be said to arise by a simulation of the form of just and accurate perceptions. Accordingly, we shall most frequently speak of them as illusions of perception.

In order to investigate the nature of any kind of error, it is needful to understand the kind of knowledge it imitates, and so we must begin our inquiry into the nature of illusions of sense by a brief account of the psychology of perception; and, in doing this, we shall proceed best by regarding this operation in its most complete form, namely, that of visual perception.

I may observe that in this analysis of perception I shall endeavour to keep to known facts, namely, the psychical phenomena or events which can be seen by the methods of scientific psychology to enter into the mental content called the percept. I do not now inquire whether such an analysis can help us to understand all that is meant by perception. This point will have to be touched later on. Here it is enough to say that, whatever our philosophy of perception may be,

we must accept the psychological fact that the concrete mental state in the act of perception is built up out of elements, the history of which can be traced by the methods of mental science.

Psychology of Perception.

Confining ourselves for the present to the mental, as distinguished from the physical, side of the operation, we soon find that perception is not so simple a matter as it might at first seem to be. When a man on a hot day looks at a running stream and "sees" the delicious coolness, it is not difficult to show that he is really performing an act of mental synthesis, or imaginative construction. To the sense-impression[5] which his eye now gives him, he adds something which past experience has bequeathed to his mind. In perception, the material of sensation is acted on by the mind, which embodies in its present attitude all the results of its past growth. Let us look at this process of synthesis a little more closely.

When a sensation arises in the mind, it may, under certain circumstances, go unattended to. In that case there is no perception. The sensation floats in the dim outer regions of consciousness as a vague feeling, the real nature and history of which are unknown. This remark applies not only to the undefined bodily sensations that are always oscillating about the threshold of obscure consciousness, but to the higher sensations connected with the special organs of perception. The student in optics soon makes the startling discovery that his field of vision has all through his life been haunted with weird shapes which have never troubled the serenity of his mind just because they have never been distinctly attended to.

The immediate result of this process of directing the keen glance of attention to a sensation is to give it greater force

and distinctness. By attending to it we discriminate it from other feelings present and past, and classify it with like sensations previously received. Thus, if I receive a visual impression of the colour orange, the first consequence of attending to it is to mark it off from other colour-impressions, including those of red and yellow. And in recognizing the peculiar quality of the impression by applying to it the term orange, I obviously connect it with other similar sensations called by the same name. If a sensation is perfectly new, there cannot, of course, be this process of classifying, and in this case the closely related operation of discriminating it from other sensations is less exactly performed. But it is hardly necessary to remark that, in the mind of the adult, under ordinary circumstances, no perfectly new sensation ever occurs.

When the sensation, or complex sensation, is thus defined and recognized, there follows the process of interpretation, by which I mean the taking up of the impression as an element into the complex mental state known as a percept. Without going into the philosophical question of what this process of synthesis exactly means, I may observe that, by common consent, it takes place to a large extent by help of a reproduction of sensations of various kinds experienced in the past. That is to say, the details in this act of combination are drawn from the store of mental recollections to which the growing mind is ever adding. In other words, the percept arises through a fusion of an actual sensation with mental representations or "images" of sensation.[6] Every element of the object that we thus take up in the act of perception, or put into the percept, as its actual size, distance, and so on, will be found to make itself known to us through mental images or revivals of past experiences, such as those we have in handling the object, moving to and from it, etc. It follows that if this is an essential ingredient in the act of perception, the process closely resembles an act of

inference; and, indeed, Helmholtz distinctly calls the perception of distance an unconscious inference or a mechanically performed act of judgment.

I have hinted that these recovered sensations include the feelings we experience in connection with muscular activity, as in moving our limbs, resisting or lifting heavy bodies, and walking to a distant object. Modern psychology refers the eye's instantaneous recognition of the most important elements of an object (its essential or "primary" qualities) to a reinstatement of such simple experiences as these. It is, indeed, these reproductions which are supposed to constitute the substantial background of our percepts.

Another thing worth noting with respect to this process of filling up a sense-impression is that it draws on past sensations of the eye itself. Thus, when I look at the figure of an acquaintance from behind, my reproductive visual imagination supplies a representation of the impressions I am wont to receive when the more interesting aspect of the object, the front view, is present to my visual sense.[7]

We may distinguish between different steps in the full act of visual recognition. First of all comes the construction of a material object of a particular figure and size, and at a particular distance; that is to say, the recognition of a tangible thing having certain simple space-properties, and holding a certain relation to other objects, and more especially our own body, in space. This is the bare perception of an object, which always takes place even in the case of perfectly new objects, provided they are seen with any degree of distinctness. It is to be added that the reference of a sensation of light or colour to such an object involves the inclusion of a quality answering to the sensation, as brightness, or blue colour, in the thing thus intuited.

This part of the process of filling in, which is the most instantaneous, automatic, and unconscious, may be supposed to answer to the most constant and therefore the most deeply organized connections of experience; for, speaking generally, we never have an impression of colour, except when there are circumstances present which are fitted to yield us those simple muscular and tactual experiences through which the ideas of a particular form, size, etc., are pretty certainly obtained.

The second step in this process of presentative construction is the recognition of an object as one of a class of things, for example, oranges, having certain special qualities, as a particular taste. In this step the connections of experience are less deeply organized, and so we are able to some extent, by reflection, to recognize it as a kind of intellectual working up of the materials supplied us by the past. It is to be noted that this process of recognition involves a compound operation of classifying impressions as distinguished from that simple operation by which a single impression, such as a particular colour, is known. Thus the recognition of such an object as an orange takes place by a rapid classing of a multitude of passive sensations of colour, light, and shade, and those active or muscular sensations which are supposed to enter into the visual perception of form.

A still less automatic step in the process of visual recognition is that of identifying individual objects, as Westminster Abbey, or a friend, John Smith. The amount of experience that is here reproduced may be very large, as in the case of recognizing a person with whom we have had a long and intimate acquaintance.

If the recognition of an object as one of a class, for example, an orange, involves a compound process of classing impressions, that of an individual object involves a still more

complicated process. The identification of a friend, simple as this operation may at first appear, really takes place by a rapid classing of all the salient characteristic features which serve as the visible marks of that particular person.

It is to be noted that each kind of recognition, specific and individual, takes place by a consciousness of likeness amid unlikeness. It is obvious that a new individual object has characters not shared in by other objects previously inspected. Thus, we at once class a man with a dark-brown skin, wearing a particular garb, as a Hindoo, though he may differ in a host of particulars from the other Hindoos that we have observed. In thus instantly recognizing him as a Hindoo, we must, it is plain, attend to the points of similarity, and overlook for the instant the points of dissimilarity. In the case of individual identification, the same thing happens. Strictly speaking, no object ever appears exactly the same to us on two occasions. Apart from changes in the object itself, especially in the case of living beings, there are varying effects of illumination, of position in relation to the eye, of distance, and so on, which very distinctly affect the visual impression at different times. Yet the fact of our instantly recognizing a familiar object in spite of these fluctuations of appearance, proves that we are able to overlook a very considerable amount of diversity when a certain amount of likeness is present.

It is further to be observed that in these last stages of perception we approach the boundary line between perception and inference. To recognize an object as one of a class is often a matter of conscious reflection and judgment, even when the class is constituted by obvious material qualities which the senses may be supposed to apprehend immediately. Still more clearly does perception pass into inference when the class is constituted by less obvious qualities, which require a careful and prolonged process of

recollection, discrimination, and comparison, for their recognition. Thus, to recognize a man by certain marks of gesture and manner as a military man or a Frenchman, though popularly called a perception, is much more of an unfolded process of conscious inference. And what applies to specific recognition applies still more forcibly to individual recognition, which is often a matter of very delicate conscious comparison and judgment. To say where the line should be drawn here between perception and observation on the one hand, and inference on the other, is clearly impossible. Our whole study of the illusions of perception will serve to show that the one shades off into the other too gradually to allow of our drawing a hard and fast line between them.

Finally, it is to be noted that these last stages of perception bring us near the boundary line which separates objective experience as common and universal, and subjective or variable experience as confined to one or to a few. In the bringing of the object under a certain class of objects there is clearly room for greater variety of individual perception. For example, the ability to recognize a man as a Frenchman turns on a special kind of previous experience. And this transition from the common or universal to the individual experience is seen yet more plainly in the case of individual recognition. To identify an object, say a particular person, commonly presupposes some previous experience or knowledge of this object, and the existence in the past of some special relation of the recognizer to the recognized, if only that of an observer. In fact, it is evident that in this mode of recognition we have the transition from common perception to individual recollection.[8]

While we may thus distinguish different steps in the process of visual recognition, we may make a further distinction, marking off a passive and an active stage in the process.

The one may be called the stage of preperception, the other that of perception proper.[9] In the first the mind holds itself in a passive attitude, except in so far as the energies of external attention are involved. The impression here awakens the mental images which answer to past experiences according to the well-known laws of association. The interpretative image which is to transform the impression into a percept is now being formed by a mere process of suggestion.

When the image is thus formed, the mind may be said to enter upon a more active stage, in which it now views the impression through the image, or applies this as a kind of mould or framework to the impression. This appears to involve an intensification of the mental image, transforming it from a representative to a presentative mental state, making it approximate somewhat to the full intensity of the sensation. In many of our instantaneous perceptions these two stages are indistinguishable to consciousness. Thus, in most cases, the recognition of size, distance, etc., takes place so rapidly that it is impossible to detect the two phases here separated. But in the classification of an object, or the identification of an individual thing, there is often an appreciable interval between the first reception of the impression and the final stage of complete recognition. And here it is easy to distinguish the two stages of preperception and perception. The interpretative image is slowly built up by the operation of suggestion, at the close of which the impression is suddenly illumined as by a flash of light, and takes a definite, precise shape.

Now, it is to be noted that the process of preperception will be greatly aided by any circumstance that facilitates the construction of the particular interpretative image required. Thus, the more frequently a similar process of perception has been performed in the past, the more ready will the

mind be to fall into the particular way of interpreting the impression. As G.H. Lewes well remarks, "The artist sees details where to other eyes there is a vague or confused mass; the naturalist sees an animal where the ordinary eye only sees a form." This is but one illustration of the seemingly universal mental law, that what is repeatedly done will be done more and more easily.

The process of preperception may be shortened, not only by means of a *permanent* disposition to frame the required interpretative scheme, the residuum of past like processes, but also by means of any *temporary* disposition pointing in the same direction. If, for example, the mind of a naturalist has just been occupied about a certain class of bird, that is to say, if he has been dwelling on the *mental image* of this bird, he will recognize one at a distance more quickly than he would otherwise have done. Such a simple mental operation as the recognition of one of the less common flowers, say a particular orchid, will vary in duration according as we have or have not been recently forming an image of this flower. The obvious explanation of this is that the mental image of an object bears a very close resemblance to the corresponding percept, differing from it, indeed, in degree only, that is to say, through the fact that it involves no actual sensation. Here again we see illustrated a general psychological law, namely, that what the mind has recently done, it tends (within certain limits) to go on doing.

It is to be noticed, further, that the perception of a single object or event is rarely an isolated act of the mind. We recognize and understand the things that surround us through their relations one to another. Sometimes the adjacent circumstances and events suggest a definite expectation of the new impression. Thus, for example, the sound of a gun heard during a walk in the country is instantly interpreted by help of suggestions due to the

previous appearance of the sportsman, and the act of raising the gun to his shoulder. It may be added that the verbal suggestions of others act very much like the suggestions of external circumstances. If I am told that a gun is going to be fired, my mind is prepared for it just as though I saw the sportsman.[10]

More frequently the effect of such surrounding circumstances is to give an air of familiarity to the new impression, to shorten the interval in which the required interpretative image is forthcoming. Thus, when travelling in Italy, the visual impression answering to a ruined temple or a bareheaded friar is construed much more rapidly than it would be elsewhere, because of the attitude of mind due to the surrounding circumstances. In all such cases the process of preperception connected with a given impression is effected more or less completely by the suggestions of other and related impressions.

It follows from all that has been just said that our minds are never in exactly the same state of readiness with respect to a particular process of perceptional interpretation. Sometimes the meaning of an impression flashes on us at once, and the stage of preperception becomes evanescent. At other times the same impression will fail for an appreciable interval to divulge its meaning. These differences are, no doubt, due in part to variations in the state of attention at the moment; but they depend as well on fluctuations in the degree of the mind's readiness to look at the impression in the required way.

In order to complete this slight analysis of perception, we must look for a moment at its physical side, that is to say, at the nervous actions which are known or supposed with some degree of probability to accompany it.