

dream, so to speak, lies in the fact that it conveys to the dreamer something which the divine personage wishes him to know, whether it be the will of this being in the shape of a command or a prohibition, or some fact as yet unknown (past or future), the knowledge of which will be of practical utility to the recipient. We may distinguish three stages in this conception of dreams:—(1) The deity sends a messenger or angel who is vaguely conceived as a spiritual being clothed in a thin material vestment; (2) the divine communicator, dispensing with the medium of a material appearance, lets his message be heard by the dreamer as the utterance of an external voice; (3) he discloses his purpose by causing to pass before the soul a vision which is not distinctly conceived as objective, but rather as something mysteriously imprinted on the mind.

The divine communication which thus makes use of the medium of a dream will, it is plain, vary considerably in the degree of its intelligibility. Sometimes the meaning of the message is obvious and unmistakable. The actions to be performed and the facts to be known are revealed plainly and directly. This will be the case for the most part with the first and second forms of dream-communication. At times, too, the divinely created vision may distinctly picture some coming event in the individual or national life. On the other hand, the communication may be disguised and only partially divulged by symbol, in which case there arises the necessity of an art of interpretation. Thus at times the oral utterance may assume the form of a dim oracular declaration which calls for careful attention and a certain skill in the application of verbal figures. It is, however, in the last form of dream-revelation that we find the greatest demands made on the interpreter's art. It follows from what has been said respecting the novelty of dream-combinations that many of the visual images which make up so large a bulk of our dreams cannot easily be fitted to any actual order of events. Hence, if such dreams are to be interpreted as having a bearing on actual events, they must be regarded as figurative or symbolic. Accordingly we find that the symbolic function of dreams has been fully recognized in all the theories of dreaming now dealt with. It seems to have been assumed that the normal mode of divine communication to man during sleep was that of such a figurative dream. And agreeably with this supposition the task of deciphering dream-symbols gradually grew into a skilled art, which became the prerogative of a certain class of experts,—as prophets, diviners, or magicians.

A very brief historical review of this religious theory of dreams must here suffice. Among the Oriental peoples this view of dreams was the prevailing one. We find, however, great differences in the mode of interpretation adopted. Among the ancient Hebrews, for example, we find all the three forms of dream-communication mentioned above. As to interpretation there seem to have been no definite rules, and the procedure followed resolves itself into an attempt to discover the most natural or least forced application of the persons, objects, and relations of the dream to some existing persons, social circumstances, and events. This mode of interpretation clearly left wide scope for individual skill. In the Persian scheme of interpretation, on the other hand, so far as we can judge of it from the compilations of a later age, the art of dream-interpretation, oneirocritics, or oneiromancy, was defined and fixed in a number of rules. Thus in the work known under the name of the *Sifat-i-Sirozah*, minute and elaborate prescriptions are given for interpreting various classes of dreams according to the particular day of the month on which they occur. A similar systematization of the rules of dream-interpretation is to be met with among the Arabs (see *L'Onirocritie Mussulman*, par Gabdorrhachaman, traduction de Pierre Vattier.) In

such cases, it is plain, the interpretation of dreams involved less of individual genius or inspiration, and became a more mechanical process, involving only careful knowledge of formulae, and one which could be easily communicated. Such a state of things points to the transition of dream-lore from the stage of an esoteric mystery to that of a communicable science. Among the Greeks and Romans the religious view of dreams is to be found in popular literature as well as in philosophic writings. In Homer, dreams are distinctly said to be sent by the gods and goddesses, as in the expression *θεῖος ὄνειρος*, and it is implied that they may be intended to deceive the subject of them (e.g., Agamemnon's dream, *Iliad*, book ii.). Similarly the dramatists frequently speak of foreknowledge divinely communicated by dreams (e.g., Clytemnestra's prescience as to the fall of Troy in the *Agamemnon* of Æschylus is ascribed to a dream). The popular view was countenanced to a certain extent by philosophers. Thus Plato found room in his mystic scheme of knowledge for the idea of a divine manifestation to the soul in sleep. In the *Timæus* (chaps. xlv. and xlvii.) a prophetic character is distinctly assigned to the images of dreams. These divine inspirations (divinations) are not, however, given to the rational soul, but to the lower appetitive soul through the medium of the sensible images of rational truths which are reflected on the liver, an organ contiguous with the bodily seat of the appetitive soul. These prophetic visions are received only when the reasoning faculty is fettered by sleep or alienated by disease and enthusiasm. In this way the divine artificer has given to the inferior regions of the soul a certain substitute for rational knowledge. At the same time the interpretation of the visions requires intelligence, and hence the business of receiving them and of interpreting them does not properly belong to the same persons. Even Aristotle treats the supposition of divine revelation in dreams very considerably when he writes, in the treatise *περὶ μαντικῆς τῆς ἐν τοῖς ὕπνοις*, "that there is a divination concerning some things in dreams is not incredible." The Stoics, again, to judge from Cicero's account of their views in his *De Divinatione*, reasoned *a priori* that the gods, if they love men and are omniscient as well as all-powerful, will certainly disclose their purposes to man in sleep. Chrysippus is, on the same authority, said to have written a volume on the interpretation of dreams as divine portents. Cicero's brother Quintus, who here defends the orthodox theory of dreams, speaks of a skilled interpretation of dreams which is a true divination, even though, like all other arts in which men have to proceed on conjecture and on artificial rules, it is not infallible. The current views of dreams of classic antiquity are supposed to be to some extent embodied in the *Ὀνειροκριτικά* of Daldianus Artemidorus of Ephesus (written about the year 170). Here the interpretation of dreams is reduced to a body of elaborate rules. To dream of a particular element, as fire, air, &c., of a particular plant, part of the body, and so on, always signifies the same kind of event for the same kind of person. It is the over-looking of the age, social condition, &c., of the dreamer which, in the view of Artemidorus, leads to the abuse of dream-interpretation. He attempts to draw a distinction between *ὄνειρος*, a vision having a real bearing on events, and *ἐνύπνιον*, a mere dream having no actual significance; but this does not, according to Liddell and Scott, correspond with classical usage. The divine origin of dreams became a doctrine of the Christian church. It appears in the writings of the fathers, being defended partly on biblical, partly on classic, authority. Synesius of Cyrene (born 375) has left a treatise on dreams (*περὶ ἐνύπνιων*). He puts forward certain psychological hypotheses drawn largely from Plato and Plotinus and ascribes to the imagination

(which is intermediate between the soul and the animal part) the power of accompanying the soul in its flights to the celestial regions, and so of sharing in the contemplation of divine truths. Synesius exalts the rank of dreaming among the arts of divination, setting it far above other modes of prophecy as being most simple and sure, open to all, unencumbered with expensive and laborious preparations, and so on. He affirms that he has repeatedly found dreams of service in arranging his ideas, and in improving his style of composition. Mediæval and modern Christian theologians have continued to attribute dreams, or, more accurately, certain orders of dream, to the intermediate agency of the divine Being. The popular theory of dreams to be met with among the later European peoples bears the impress of that folk-lore which developed itself in the Middle Ages under influences partly Christian, partly pagan. Dreams were referred to a variety of supernatural agencies, including not only God and the devil, but also subordinate beings, as fairy, fiend (incubus), &c. Further, the art of interpreting dreams according to definite rules (oneiromancy) was developed to a very high point. (See Brand, *Popular Antiquities*, vol. iii. *Dictionary of Dreams*.) In our own times certain restricted classes of dreams are customarily associated with the action of benevolent or malignant beings. On the other hand, people are now wont to interpret dreams as omens or signs without distinctly attributing them to any supernatural agent. This view of dreams forms the transition-point between the religious and the scientific theories.

(c) *The Dream as a Subjective Phenomenon Dependent on Natural Causes.*—While the theory of the divine or supernatural origin of dreams has thus held its ground so long, there has been gradually growing up from an early period of human history a more scientific conception of the phenomenon as dependent on natural laws (of mind and body). Psychologists and physiologists alike have approached the subject from their respective points of view, and sought to explain the phenomena of dreaming as natural events. The first germs of a scientific theory of dreams are to be found in antiquity. Thus Democritus, from whom the Epicureans derived their theory, held that dreams are the product of the simulacra or phantasms of corporeal objects which are constantly floating in the atmosphere, and which attack the soul during repose. Again, Plato speaks in the *Republic* of dreaming as illustrating the dominant mental impulses and habits of the individual (unchecked appetite, and temperance with intellectual pursuits), and thus connects it with the normal waking operations of feeling and thought. Aristotle in his short treatise on dreams (*περὶ ἐνύπνιων*) refers dreaming to the action of objects of outward sense which leave behind impressions on the soul and bodily frame. Dreaming is said to be the function of the sensitive part of the mind, but of this so far as phantastic; and a dream is defined as "the phantasm arising from the motion of sensible perceptions when it presents itself to him who is asleep." Aristotle further has some correct observations on the immediate bodily conditions of dreaming, and on the exaggeration of sensation in this condition of mind. Thus, he says, we fancy it thunders and lightens when a small sound is produced in our ears; we imagine that we are eating honey in consequence of a defluxion of the least quantity of phlegm. In the *De Divinatione* of Cicero we have almost a unique instance among classic writings of a complete rejection of the doctrine of the supernatural origin of dreams, and of a full and consistent adoption of the natural method of explaining the phenomena. Cicero's position stands in marked contrast to that of partial sceptics, as, for example, Pliny, who seems content to exclude from the supernatural method of explanation certain

of the more obviously natural dreams, such as those occurring immediately after food and wine, or when one has just fallen asleep after waking (*Nat. Hist.*)

While philosophers were thus learning to regard dreams as natural processes, physicians, on the other side, had their attention called to dreaming in its relation to pathological bodily conditions. It seems probable, indeed, that men occupied in studying bodily diseases were among the first to suspect the true nature and origin of dreaming. Thus Hippocrates, while inclined to admit that some dreams may be divine, distinctly says that others arise from the action of the mind and the body. Hippocrates, too, appears to have been the first to supply a scientific basis for the premonitory character of certain kinds of dreams. There are dreams, he says, which announce beforehand the affections of the body. This idea has, as we shall see presently, been confirmed by modern pathological observations. It is easy to understand that this prognostic side of dreams was in the early stages of knowledge greatly exaggerated. This appears to be true of the speculations of Galen, who held that to dream one's thigh was turned into stone signified the approaching loss of this member. This belief in the premonitory character of dreams was only one side of a general doctrine of dreams according to which they arise from bodily disturbances, and so may serve as symptoms which the physician has to include in the complete diagnosis of a disease. This idea, which is recognized by modern physiologists as true within certain limits, led in the first crude stages of scientific investigation to exaggerated and fanciful conclusions. Thus a new system of dream-interpretation came into vogue according to which to dream of a certain thing always means a disturbance in one particular organ. In the doctrines of Oriental physicians (the Hindus and Chinese) dreams are thus referred to pathological states of the five organs—heart, lungs, kidneys, spleen, and liver. Thus to dream of war and fighting signifies a bad state of the lungs; of fire, smoke, &c., a bad state of the heart, and so on.

*Modern Theory of Dreams.*—Under this head we shall give an account of the principal results of modern investigations, psychological and physiological, on the nature and conditions of dreams. Respecting many points there is still considerable diversity of view. Certain questions of fact yet remain unanswered, the reason of this being the inaccessibility of dream-phenomena to accurate and adequate observation. Further, owing to the divided condition of psychological principles, the explanation of dreaming assumes very different forms with different writers. On the one hand there are those who conceive the mind as an independent spiritual substance, which employs the body as its instrument, but is not dependent on this. With these, dreams will naturally wear the aspect of products of some spiritual faculty or faculties which are not involved in the sleep of the body and the senses. At the other extreme are those who regard mental phenomena as an outcome of bodily changes, as a refined result of physical processes. By these, dreams will be regarded as given off, so to speak, by the various organs of the body during sleep. Midway between the spiritualist and materialist hypotheses is the scientific view in its narrower sense, namely, the doctrine that the mental and the bodily are perfectly dissimilar regions of phenomena, which are yet connected in such a way that bodily events appear as the conditions of mental events. In the following account of modern dream theory we shall confine ourselves for the most part to the last stand-point, though indicating here and there how the other theories of the relation of mind to body lead to divergent conclusions.

On the very threshold of our inquiry we are met by a much disputed question—What is the relation of dreaming

to sleep? Is dreaming an indication of imperfect sleep which must cease as soon as the higher nervous centres reach a complete repose? Is it, on the other hand, something wholly spiritual and independent of sleep as a bodily condition? Here we have two different views arising from different theories of the relation of mind and body. These distinct views of the subject have commonly appeared as answers to the question of fact—Are we when asleep always dreaming? This question was first raised by philosophers in connection with certain conceptions of the soul and its activity. Descartes, who regarded thought as of the essence of personal existence, was naturally led to maintain that the mind is always thinking. "I am," he says, "I exist, that is certain; but for how long? as long as I think; for perhaps even it might happen that if I ceased wholly to think I should cease at the same time wholly to exist" (*Meditation ii.*). Among the Cartesians the proposition, the mind is always thinking, became a leading tenet. Locke argues against this supposition. He contends that in sleep men do not always think, or they would be conscious of it. If it is asserted that they dream but they forget it, he replies it is "hard to be conceived" that "the soul in a sleeping man should be this moment busy a-thinking, and the next moment in a waking man not remember nor be able to recollect one jot of all those thoughts." To suppose that in sleep the soul thinks apart from the body involves the absurdity of a double mind, and is further contradicted by the irrationality of dreams (*Essay*, book ii. ch. i.). Locke was answered by Leibnitz in the *Nouveaux Essais*, who upheld the Cartesian affirmation, and maintained that during sleep the mind has always some "little perceptions" or "confused sentiments," though, according to his doctrine of unconscious perceptions, these need not become objects of conscious attention. That we never sleep without dreaming is further maintained by Kant in his *Anthropologie*, by Jouffroy and others. In his *Lectures on Metaphysics*, Sir W. Hamilton argues fully for the same idea. He says that during sleep the mind "is never either inactive or wholly unconscious." He seeks to refute the argument of Locke, that we ought to remember our dreams, by calling attention to the fact that the somnambulist has no recollection of his dream, and that persons who betray in their expression and utterance the fact of dreaming retain no recollection of the state. He further holds that the continuity of dreaming is proved by the fact that whenever we are suddenly roused from sleep we find ourselves dreaming.

While metaphysicians have thus in the main affirmed the continuity of dreams, those who regard mental phenomena as invariably connected with bodily conditions have for the most part viewed dreaming as only an occasional accompaniment of sleep. By some, indeed, dreaming is viewed as confined to the transition state from sleeping to waking, though this view is now rejected by physiologists no less than by metaphysicians. It is true that the great rapidity of dream-thought has been proved, e.g., by the experience of Lord Holland, who fell asleep when listening to somebody reading, had a long dream, and yet awoke in time to hear the conclusion of the sentence of which he remembered the beginning. And this takes off from the value of Hamilton's argument that we always find ourselves dreaming when awakened, for such dreaming may clearly be an incident of the transition state. Yet the other facts emphasized by Hamilton, as well as the results of Maury's experiments, to be spoken of presently, show that we may dream when soundly sleeping. On the other hand, we cannot, it is certain, directly prove that we are always dreaming during sleep. Many physiologists are disposed to regard dreaming as the accompaniment of some slight disturbance, whether arising from the lower organs or from

an undue excitability of the brain and its nervous connections; and according to this view the continuity of dreaming would seem to be an improbable supposition. To the physiologist the idea of perfectly unconscious sleep presents no difficulties. The results of experiment show him that the lower bodily (vegetative) functions are independent of cerebral activity; and the phenomena of swooning, the effects of anaesthetics, &c., familiarize him with the temporary suspension of the conscious activity of the brain. Hence the view commonly adopted by physiologists seems to be that dreaming is only an occasional incident of sleep. (See the article on "Sleep and Dreams" by Dr Carpenter in Todd's *Encyc. of Anat. and Physiol.*) At the same time certain physiologists, as Sir H. Holland (*Chapters on Ment. Physiol.*) and Sir Benj. Brodie (*Psychological Inquiries*), are disposed to think that dreaming is the rule and not the exception.

The question whether we are always dreaming during sleep leads up naturally to the inquiry into the causes or conditions of dreams. This question has been approached from different sides. On the one side, metaphysicians have sought to account for dreaming by some simple theory of a suspension of certain mental faculties. On the other side, writers have tried to explain dreaming as a result of simple bodily operations. We will just glance at one or two of these simple hypotheses. A common view among metaphysicians is that the nature of dreaming is amply explained by the absence or suspension of the will. The importance of the cessation of the will's action has been emphasized by Dugald Stewart (*Elements of the Phil. of the Human Mind*, vol. i. chap. v. sect. 5). Stewart does not mean that the will is wholly dormant in sleep, but that it loses its hold on the faculties. By this supposition he seeks to account not only for the incoherence but also for the apparent reality of dream-images. That the absence of the normal processes of volition, especially as involved in attention, constitutes one important factor in the explanation of dreaming seems to be admitted by all writers,—for example, Dr Darwin (*Zoonomia*), Sir Benj. Brodie, Dr Carpenter, and M. Alf. Maury (*Le Sommeil et les Rêves*). It is doubtful, however, whether this simple hypothesis explains all that Stewart refers to it. Maury objects to Stewart's theory that the will does not wholly lose its command of the bodily organs, &c., in dreams.

While great stress has thus been laid by some writers on this negative condition, the suspension of will, others have sought to construct a simple theory of dreaming by supposing the unimpeded action of some special mental faculty. Thus Cudworth (*Treatise concerning Eternal and Immutable Morality*) reasons, from the orderly coherence of dream-imaginings and the novelty of their combinations, that this state of mind arises from the action of "the phantastical power of the soul," and not from "any fortuitous dancings of the spirits." A very curious theory of dreaming as depending on a particular circumscribed faculty of the soul is to be found in Scherner's *Das Leben des Traumes*. Dreaming is a decentralization of the movement of life. In waking consciousness the central force, the ego spontaneity, is supreme,—in dreaming the activity of the ego becomes purely receptive. The central ego is now merely the point about which the peripheral life plays in perfect freedom. Thus the will (the spontaneous ego) is suspended, and thought loses its categories. On the other hand, the imagination now freed from the ego reaches its perfect unrestrained function. And this function is seen in the symbolic representation both of the bodily parts and of the mental stimuli which influence consciousness in sleep. A similar conception of the action of the creative fancy in dreaming is adopted by Dr Johannea Volkelt (*Die Traumphantasie*.)

In addition to these simple metaphysical and psychological theories of dreaming, there are to be found no less simple physiological hypotheses. Among these we may take the opinion of Hobbes (*Leviathan*), that the imaginings of dreams all proceed from "the agitation of the inward parts of a man's body," the disturbance of which parts, owing to their connections with the brain, serves to keep the latter in motion. Another simple physiological hypothesis for explaining dreams is offered by Schopenhauer. According to this writer, the exciting causes of dreams are impressions received from the internal regions of the organism through the sympathetic nervous system. These impressions are afterwards worked up by the mind into quasi-realities by means of its "forms" of space, time, &c.

This simple and "geometric" method of explaining dreams, though it may be valuable up to a certain point, must necessarily fail to account for all the phenomena concerned. As we have shown in our preliminary description of dreams, their contents vary within very wide limits, and cannot therefore all be referred to one or two simple principles whether mental faculties or bodily stimuli; also, it is by no means safe to affirm of any mental function that it is universally absent in dreams, since the second mental processes, as Sir H. Holland and M. Maury point out, enter in very unequal degrees into different dreams.

A full and exhaustive theory of dreaming would seem to include several distinct lines of inquiry. Among these there are three which have already been well defined by recent writers on the subject. The first relates to the sources of dream-imaginings, or the stimulations which are the immediate causes of these. The second question has to do with the order or form of dream-combinations, and seeks to determine the conditions of the peculiar arrangements, simultaneous and successive, which are observable in dreams. The last problem is that of accounting for the objective reality and generally for the intensity and impressiveness of dream-fancies.

In briefly opening up each of these lines of inquiry we shall seek to keep in mind the variable as well as the constant features of dreaming; also we shall proceed, as far as possible, according to that double method of study, the psychological and the physiological (subjective and objective), which offers itself to those who accept the idea of a perfect parallelism between mental and bodily events.

(A) *The Sources of Dream Materials.*—The numerous images which make up the ever-renewed current of a dream appear sometimes to come from the internal depths of the mind itself. In other cases, as even the ancients recognized, they depend on a stimulation of the brain arising from varying conditions of the bodily organs. According to the view that all mental events have their physical accompaniments, the first class of imaginings must also be referred to certain conditions of the brain and nervous system. These various sources of dream-activity are roughly classified by Hartley in his *Observations on Man*. Dream-images, he tells us, are deducible from three causes:—(1) impressions and ideas lately received; (2) present state of the body (especially the stomach and the brain); (3) association. The large part played by bodily states in our dream-life is recognized not only by physiologists, as Maury, but also by those who ascribe dreams in part to occult spiritual faculties, as Scherner. By help of the results of recent researches we are able to improve a little on Hartley's classification. The exciting causes of dream-images fall into two main classes:—(I.) peripheral, and (II.) central stimulations. The latter arise in the outlying parts of the nervous system, namely, the organs of sense, the muscular apparatus, the internal bodily organs, together with the external portions of the nerves connected with these.

Central stimulations are such as arise mainly, if not entirely, within the encephalic region. These again are either (a) direct, or (β) indirect. The first depend on the condition of the nerve-elements acted upon, and the unknown influences (possibly connected with the condition of the circulation) brought to bear on these at the moment. The indirect stimulations arise as a result of some preceding excitation in a connected region of the brain. The former underlie the apparently spontaneous imaginings of dreaming, as well as those which are the echo of a recent waking experience. The latter are the physical counterpart of images or ideas called up by association with preceding images or thoughts.

(1.) Among peripheral stimulations are to be noticed (a) those which arise from the action of external objects on the organs of sensation. Recent researches show that these may play an important part in dreams. Dr Beattie speaks of a man who could be made to dream about a subject by whispering into his ear. Experiments were made by M. Giron de Buzareingnes (*Journal de Physiol.* tom. viii.) as to the effects of external impressions on dreaming. Thus, by leaving his knee uncovered during sleep, he dreamt he was travelling in a diligence (where knees are apt to get cold). The most elaborate experiments bearing on this point have been carried on by Alf. Maury, with the help of an assistant. The latter produces some external stimulation while the experimenter sleeps; he is then awakened up so as to record, the dream immediately resulting. By this means important results were reached. When, for example, his lips were tickled, he dreamt that he was subjected to horrible tortures, that pitch plaster was applied to his face and then torn off. Sensations of hearing, smell, and taste were also followed by appropriate though greatly exaggerated images. Wundt (*Physiologische Psychologie*) thinks that cutaneous sensations, arising from the varying pressure and temperature of the bodily surface, are frequent excitants of dream-images.

(β) Along with such objective sensations must be reckoned subjective sensations which arise in the absence of external stimuli, and which have as their physical basis certain actions in the peripheral as well as the central regions of the nerves. Of such are the visual images (*Schlumberbilder*) seen by J. Müller, Goethe, Purkinje, and others, when the body is disposed to sleep. These are called the dream-chaos by Gruithuisen, since they are supposed to form the raw material of dreams. Maury gives a full account of these phenomena, which he terms "hypnagogic hallucinations," and which appear to include not only visual images but also subjective sensations of sound, touch, &c. He attaches great importance to the action of these subjective sensations in dreams. The predominance of visual imagery in dreaming appears to be connected with the great activity of the organ of sight and its consequent excitability. It is to be added that one can only roughly distinguish these subjective sensations, which involve the peripheral regions of the nervous system, from images supposed to be confined to the central regions. (γ) The conditions of our muscles during sleep, which somehow convey impressions to the brain, affect consciousness, and so influence dreaming. To this source we must refer the active phenomena of dreams, as running, flying, resisting, struggling, &c. It is probable, as Wundt remarks, that the movements of the body during sleep, as those of breathing and the extensions and contractions of the limbs, give rise to dream fancies, and painful conditions of the muscles due to an awkward position of the limbs may also serve to excite images. (δ) Among the most frequent excitants of dreams are organic or systemic sensations connected with the varying states of the internal bodily organs. The prominence given to this source of dreaming

in ancient and modern systems of medicine has already been referred to. States of the stomach, lungs, heart, secretory organs, teeth and gums, &c., are, as we all know, powerful provocatives of dreams. Owing to the close connection of dreams with these organic conditions they may serve as important elements in the diagnosis of bodily disease. Thus M. Macario (*Du Sommeil, des Rêves, et du Somnambulisme*) recognizes among the morbid class of dreams those which are "prodromic," or premonitory (e.g., a dream of sanguinary conflict before hemorrhage), as well as those which are symptomatic of existing bodily and mental disorders.

(II.) We pass to internal or cerebral excitations. Under (a), the direct excitations, are to be included all dream-ideas which do not arise from bodily stimuli, or through association with preceding feelings and ideas. It seems fairly certain that many of our dream-images are thus occasioned by a kind of "automatic excitation" of the cerebral regions. The dreams which clearly arise from an after-effect in the brain of recent perceptions, especially those of the previous day, appear to illustrate this process. Also, many of the images which correspond to persons and scenes supposed to be long since forgotten may be due to some such local automatic cerebral "sub-excitation." Maury distinctly recognizes this factor in dream-stimulation. It appears from experiences recorded by him that by means of these automatic central excitations images may sometimes be called up of objects which have never been distinctly perceived, and which yet have left a trace of their action on the cerebral substance. (β) The indirect central stimulations include, no doubt, a large number of our dream-fancies. When once a starting-point is reached, whether through a peripheral or a central automatic (direct) excitation, the nervous connections which answer to mental associations provide a vast range of new cerebration. It is to be added that the very same causes which excite particular cerebral regions to automatic action must affect other and connected parts in a less degree, producing a powerful predisposition to activity. Hence it is to be supposed that links of association which are insufficient to restore an idea to consciousness in the waking state may suffice to do so in sleep.

(B) *The Order of Dream-Combinations.*—Dreams are commonly said to be incoherent, and this is no doubt frequently the case. On the other hand many dreams appear to simulate orderly arrangements of objects and successions of events. It must follow that on simple theory, such as that the mind has lost the forms of thought—as space, time, and causation (which, as we have seen, is contradicted by Schopenhauer)—will cover all the facts. The absence of volition and voluntary attention goes far to throw light on dream-combinations. In dreaming, as Maury observes, attention, instead of dominating the images which present themselves, is itself dominated by these. At the same time, as we shall see presently, the action of attention, though no longer controlled by the will and directed to some practical end, plays an important part in dream-construction. In order, if possible, to get at the laws of dream-structure, we may roughly divide dreams into two classes:—(a) the disconnected and incoherent, and (β) the coherent.

(a) The want of coherence in disorderly dreams appears to arise from the play of association acting on all the heterogeneous and disconnected elements supplied by peripheral and central (direct) stimulation at the time, there being no volitional control (dominating attention) to interfere with the process. Supposing that these two primary sources are continually sending forth new and disconnected images to the dream-consciousness, and that owing to the extreme excitability of the brain during sleep numerous

paths of association open themselves up in connection with every such image, we may see how it is that objects group themselves, and events succeed one another in such a chaotic manner. It is not correct to say that we here dispense with the "forms" of space and time; objects are viewed in space, and events "intuited" in time, it is only that the particular positions of things in space and time are overlooked. On the other hand, it is true that there is in these loosely-threaded dreams, if not in all dreams, a suspension of the reasoning process by which objects are intuited in a causal relation. In these dreams, then, the mind is passive, and consciousness is made up of a flux of images and feelings which is not analyzed and rationalized as it is in the normal processes of waking perception.

(β) Let us now consider the more coherent class of dreams. These, as we have seen, have by some been accounted for as the products of some occult power of the soul, as the "phantastical power" of Cudworth and the symbolic plastic phantasy of Scherner. There is no doubt that in many of the more elaborate and pictorial of our dreams a result is reached very similar to the products of the waking imagination. Can this operation be analyzed into simple processes? First of all, the images, however disconnected their corresponding objects may be, group themselves in a certain arrangement. This process would be described by psychologists of the Kantian school as the superposition on the dream-materials of certain mental forms. On the other hand, it may perhaps be explained as a result of association. When two orders of impression—for example, the sight of the human form and the sound of a human voice—have been habitually associated, there arises what may be called a general associative disposition to connect some variety of one order of impression with any particular variety of the order which happens to present itself to the mind; and so, when dreaming, the mind is disposed to add to images of colour certain relations of space, position, magnitude, &c., to images of human beings some forms of the appropriate human actions, relations, &c. By this means the intuitive clearness and completeness of our dream-imaginings may largely be accounted for. It is to be added that these general associative tendencies do not determine what particular relations or actions are to be attributed to the images of sleep. These latter depend on the particular circumstances of the moment, as, for example, the locality of the optic fibres involved, the varying excitability of the central regions, &c.

In this factor of our dream-constructions the mind seems to be wholly passive. We have now to turn to a second influence, which involves to some extent the active side of the mind, namely, the play of attention under the influence, not of the will, but of certain vague emotional impulses. The chief of these are the feeling for unity, and the instinct of emotional harmony. First of all, there seems to be a tendency in the more orderly dreams to bring new images into some intelligible connection or relation of unity with the pre-existing ones. This vague impulse, acting through the processes of expectation and attention, becomes selective, leading to a detention of those members of the ever-renewed flux of images which are fitted to enter into the dream-scene as consistent factors. In certain cases, indeed, this process seems to rise to something like a conscious voluntary exertion. We occasionally remember that we strove in our dream to discover a consistency in the variegated and confused scene presented to consciousness. Secondly, the unity of dream-structure is largely determined by the need of emotional harmony. A large part, if not all, of our dream-fancies are attended with a feeling of pleasure or of pain. Now, when a certain state of emotion has been excited in the mind, there is a tendency to reject all ideas

which conflict with this feeling, and to accept any which harmonize with it. The emotion controls the movements of anticipation and of intellectual attention, so that suitable ideas are at once recognized and detained. The unity of our most complex dreams appears to arise very largely from this source. In dreams described by Scherner, Volkelt, and Wundt the successions of imaginary events are clearly strung together by a thread of emotion, as joy, terror, and so on. The commonest example of such a dominating emotional tone in dreaming occurs when there is a current of pleasurable or painful feeling contributed by the condition of some of the internal organs of the body. These bodily sensations become the basis of complex groups of images, each new scene being connected with some analogous shade of feeling, "bodily" or "mental."

(C) *The Objective Reality and Intensity of Dream-Imaginations.*—These are explained by Hartley by two circumstances,—first, the absence of any other reality to oppose to the ideas which offer themselves; and secondly, the greater vividness of the visible ideas which occur in dreams as measured by the corresponding waking ideas. This last fact may, he thinks, be partly accounted for by an increased heat of the brain. As already remarked, Dugald Stewart explains the reality of dreams through the suspension of the ordinary action of volition. In waking life, he says, we distinguish objective impressions from ideas by finding that the former are independent of volition, while the latter are dependent on the same. Hence, in dreaming, when the will no longer controls ideas, these are mistaken for realities. The chief influences here concerned appear to be included in Hartley's theory, though the circumstances emphasized by Stewart may be a secondary element in the case. That the reality of dream-images depends in large part on the absence of external impressions has been recognized by most recent writers. Among others M. Taine (*De l'Intelligence*) dwells on the function of external sensation as a corrective to internal imaginings, keeping these below the illusory stage. External impressions are distinguished from ideas in the waking state, in part at least, by their greater intensity. When this relation is no longer recognized by reason either of the ideas acquiring preternatural vividness or of the sensations being withdrawn, illusion follows. Waking hallucinations depend on the first circumstance, dream-illusions on the second, perhaps also on the first as well. This leads us to the reflection that during sleep the ideas arising in consciousness undergo an increase of absolute as well as of relative vividness. That is to say, they are in themselves more intense states of consciousness than waking ideas. This seems to point, as Maury observes, to an increased excitability of the nervous substance in sleep. This same circumstance, too, helps to account for the preternatural impressiveness and the exaggeration which meet us in dream-life. If the brain is during sleep peculiarly excitable it will follow that all sensational stimuli, external and internal alike, will produce an exaggerated result. Thus the intensity of sensations will be augmented, and their volume, and so the apparent magnitude of dream-images be increased. Again, if in dreaming the stream of fancies be a rapid one, if images simultaneously and successively crowd in on consciousness, we may understand how space and time may appear to swell to unusual proportions. Once more, the peculiar excitability of the brain will manifest itself in an exaggeration of all feeling. Slight bodily discomforts, for example, will be transformed, as in Maury's experiments, into huge sufferings, and so locally circumscribed bodily sensations of pleasure may expand into preternatural forms of emotional delight.

We are now perhaps in a position to explain the symbolic function of dreams so much emphasized by

Scherner. He considers that our dream-phantasy habitually represents the seat of bodily sensations under the symbol of a house and its parts, and the silent processes of thought as the audible conversation of living persons. The latter remark is probably correct, and its truth follows from a consideration of the close association between thought and audible speech. The former observation is surely an exaggerated statement, as has been shown by his friendly critic Volkelt. Yet though bodily sensations do not as a rule reveal themselves under the symbol of a building or mass of buildings, they undoubtedly do appear in consciousness disguised and transformed; and the reasons of this are plain. Even in the waking condition we have but a vague consciousness of the seat of the bodily sensations, and in sleep this can hardly be present at all. In addition to this, the exaggerating influences just referred to must tend to disguise the real nature of bodily sensations, and so to remove all consciousness of their locality. Hence bodily sensations do as a rule clothe themselves in a disguise appearing under the form of emotional experiences. And the particular pleasurable or painful images selected, which will vary with the individual's emotional nature and experience, will be apt to recur as a "symbolic expression" of this variety of bodily feeling. It will follow, too, from the predominance of visual ideas in dreams, that these emotional fancies will commonly take the shape of alluring or alarming visual perceptions.

Dreaming is a subject of great interest by reason of its points of contact with other mental conditions. Thus the common suspension of many of the higher processes of emotion, thought, and volition suggests an analogy between the dreaming state and the instinctive stage of mental growth as observable in children, primitive men, and the lower animals. This aspect of dreams has been treated by Maury.

Again, dreaming has many curious resemblances to the mental states of the insane. The differences which mark off dreaming from these states have already been given. The resemblances between them are no less important. In the illusory intensity of its internal images, in the rapidity of its flux of ideas, and in the wildness and incoherence of its combinations, the dream stands very close to the whole class of hallucinations and illusions of waking life. In truth, a systematic psychological treatment of dreams must connect them with other forms of illusion. This is done, for example, by Wundt, who refers all these groups of phenomena to an increased excitability of the sensory regions of the brain. Maury seems disposed to regard dreaming as the incipient stage of a pathological mental condition, of which somnambulism, insanity, &c., are more fully developed forms. Among other writers who have discussed dreams in relation to these other abnormal states of mind are Macario (*op. cit.*), Bierre de Boismont (*Les Hallucinations*), J. Moreau (*Du Haschisch et d'Aliénation Mentale*), also Sir H. Holland, and Dr Carpenter (*Mental Physiology*).

A good deal of random and undigested information respecting dreams and dream-theories is to be found in Mr Frank Scafield's *Literature and Curiosities of Dreams*. A curious account of the ancients' views of dreams is to be met with in a work entitled *Histoire du Somnambulisme*, par Austin Gauthier. For the best statement of the modern theory of dreams, the student is referred to the works of Maury, Wundt, Carpenter, and Volkelt, already named. Dreams have been roughly classified according to the source of their images and the relative activity of association and imagination involved, by Scherner, Volkelt, and others. The view of the processes involved in the imaginative construction of dreams here adopted has been more fully developed by the present writer in an article in the *Cornhill Magazine* of November 1876. (J. S.)

DREDGE, THE NATURALIST'S, an implement constructed on the general plan of the common oyster-dredge, and used by naturalists for obtaining specimens of the