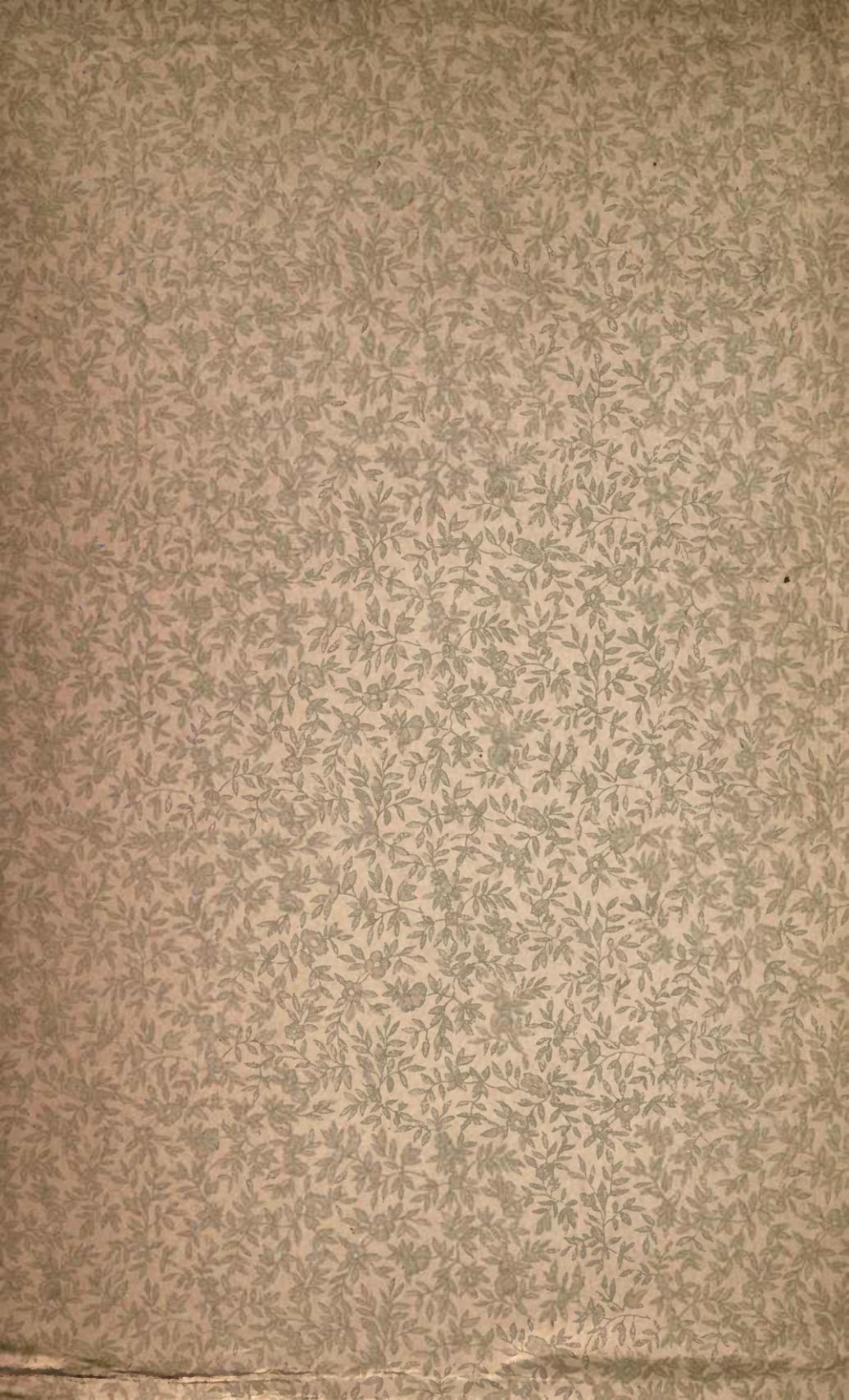
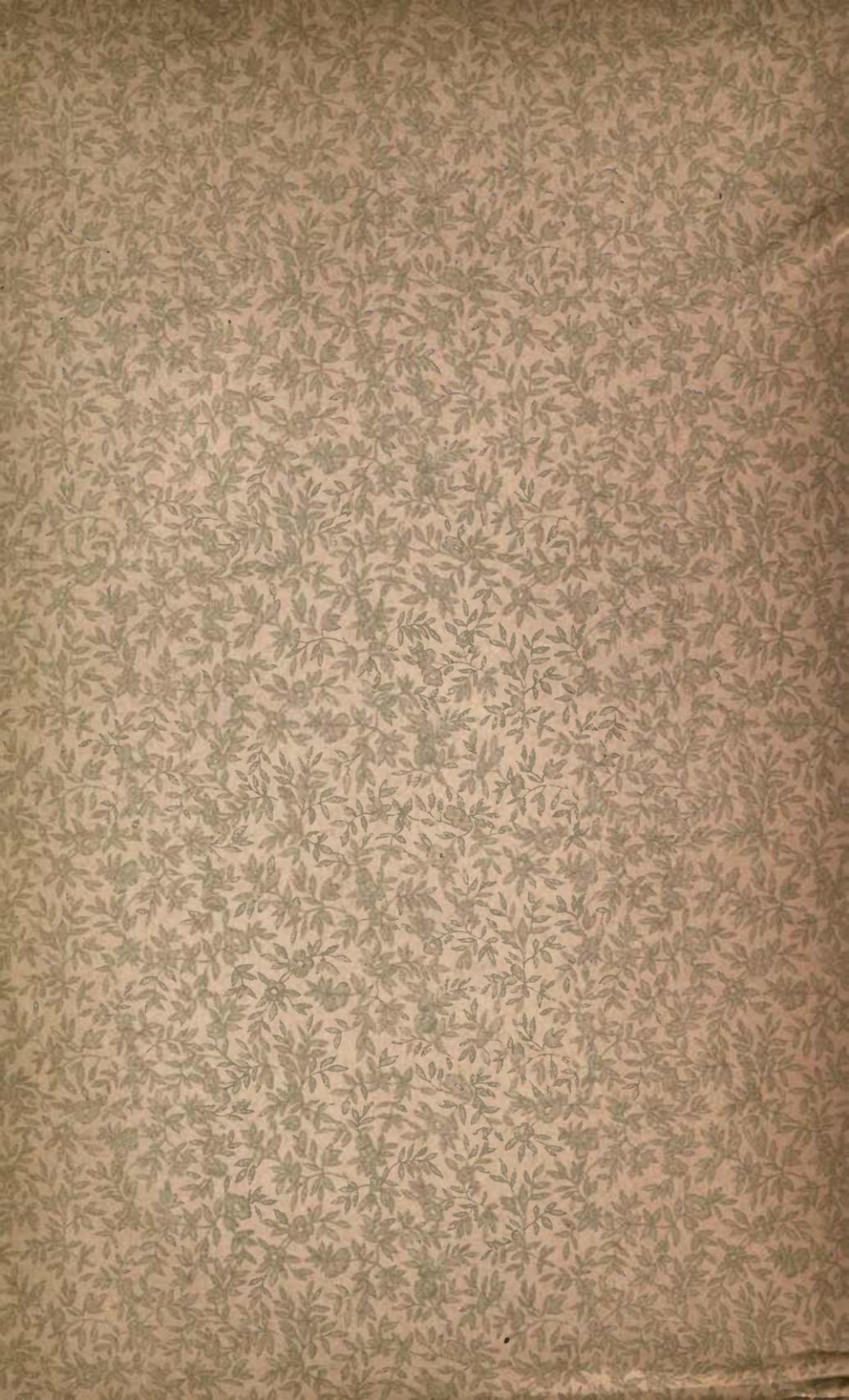


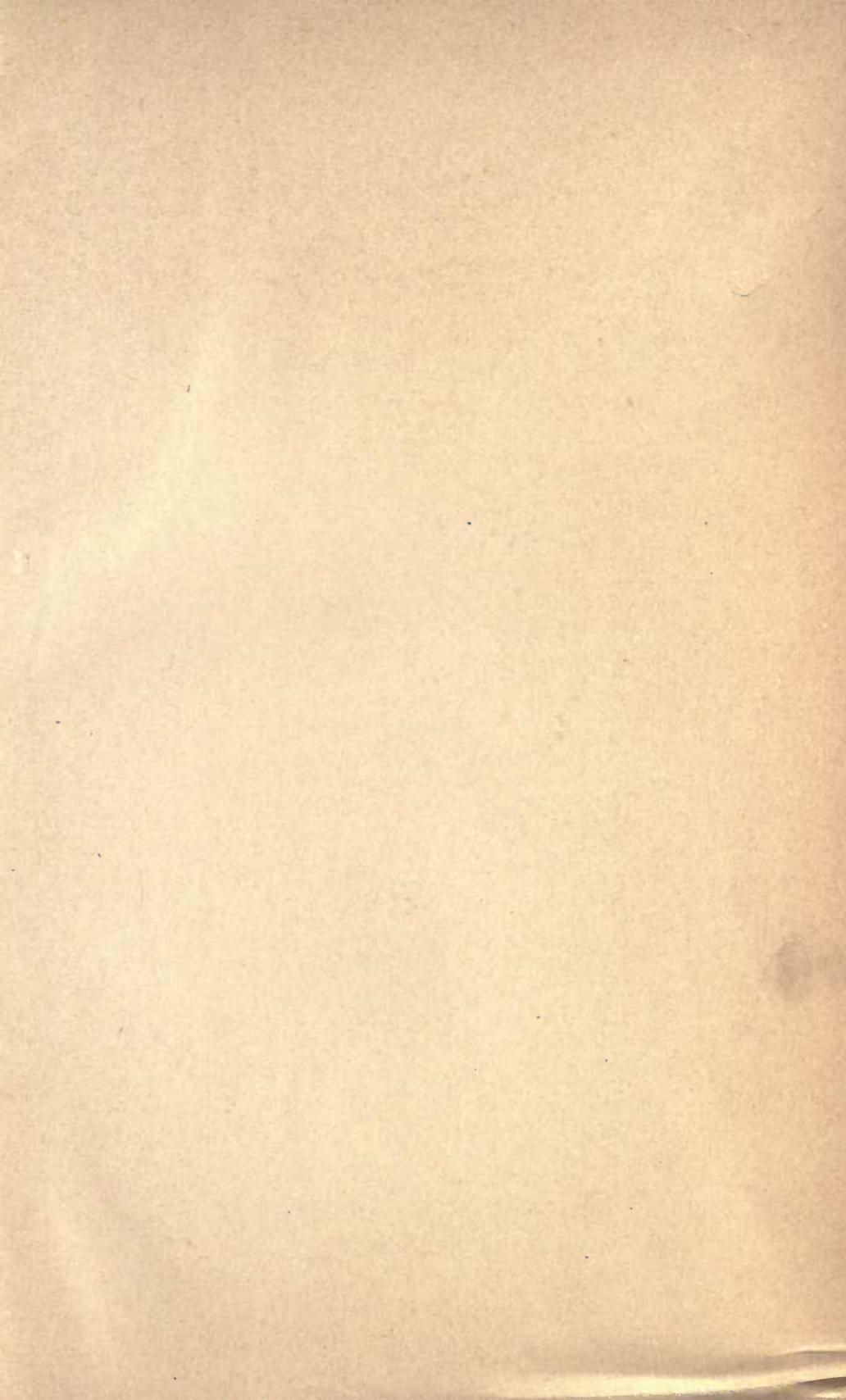
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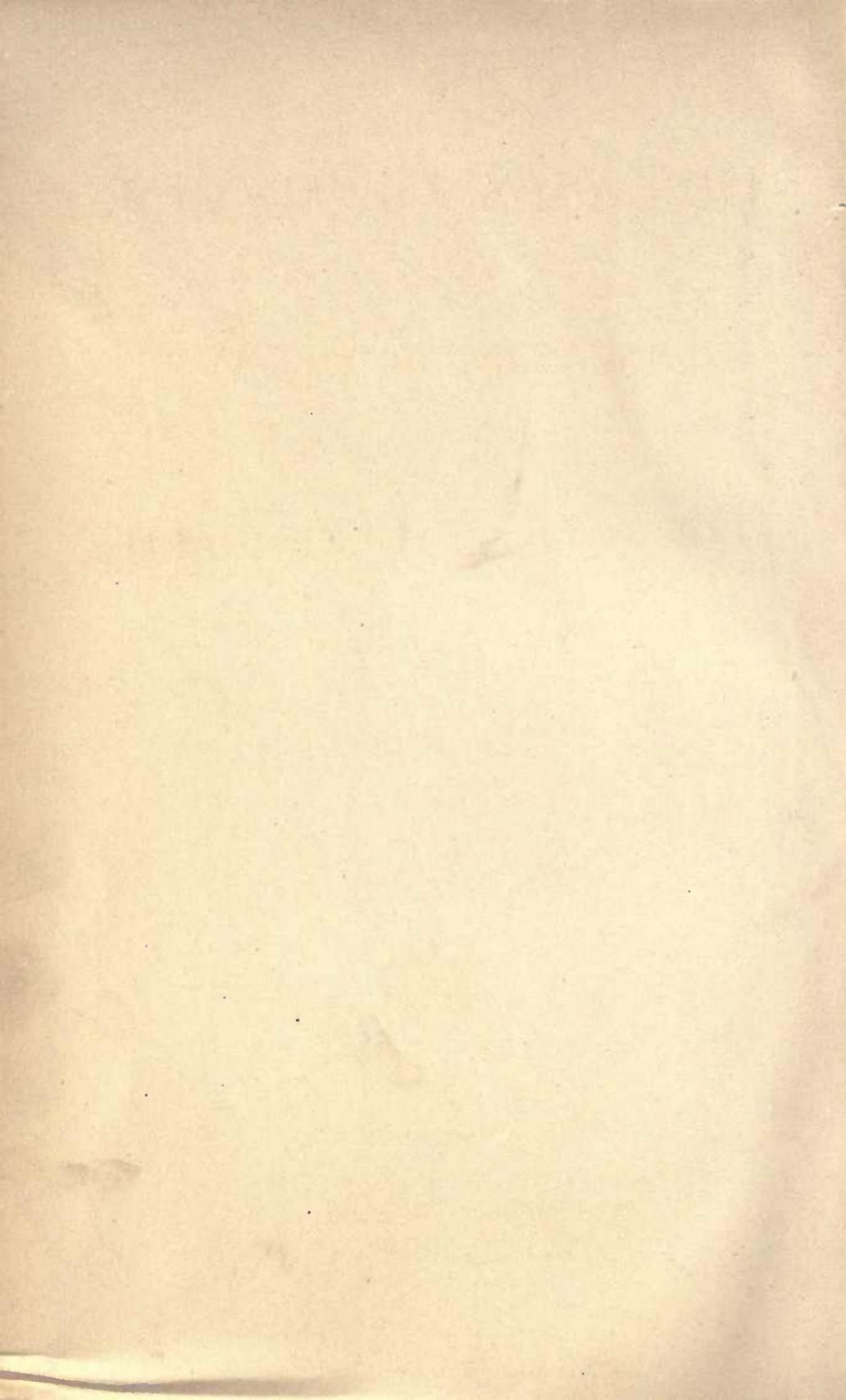






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DISEASES OF MEMORY

DISEASES OF THE WILL

AND

DISEASES OF PERSONALITY

BY

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THE DISEASES OF MEMORY.

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TRANSLATED FROM THE FRENCH BY J. FITZGERALD, A. M.

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PREFACE.

My purpose in this work has been to present a psychological monograph of the diseases of memory, and, so far as the state of our knowledge permits, to deduce therefrom a few conclusions. The memory has often been studied, but hardly on its pathological side; and it has seemed to me that it might be profitable to view the subject under that aspect. I have endeavored to restrict myself to that, and have spoken of normal memory only so far as was necessary for clearness.

I have cited many facts, and in this respect my method is not the literary one; but I hold it to be the only one for conveying instruction. To describe in general terms the disordered states of the memory, without giving instances of each, appears to me to be labor thrown away, because it is important that the author's conclusions be capable of verification at every step. I beg the reader to note that what is offered to him here is an essay in descriptive psychology, *i. e.*, a chapter in natural history, and nothing more; and that, if it possesses no other merit, this little volume will acquaint him with a mass of curious observations and cases scattered through all sorts of compilations, and now for the first time collected together.

January, 1881.

T. R

CHAPTER I.

MEMORY AS A BIOLOGICAL FACT.

Memory essentially a biological fact, incidentally a psychic fact—Organic memory—Modifications of nerve-elements; dynamic associations between these elements—Conscious memory—Conditions of consciousness: intensity; duration—Unconscious cerebration—Nerve action is the fundamental condition of memory; consciousness is only an accessory—Localization in the past, or recollection—Mechanism of this operation—It is not a simple and instantaneous act; it consists of the addition of secondary states of consciousness to the principal state of consciousness—Memory is a vision in time—Localization, theoretical and practical—Reference points—Resemblance and difference between localization in the future and in the past—All memory an illusion—Forgetfulness a condition of memory—Return to the starting point: conscious memory tends little by little to become automatic.

The descriptive study of memory has been very well performed by divers authors, especially by the Scotch, and hence it is not designed to revert to it. I propose to inquire what we may learn from the new method in psychology as to the nature of memory; to

show that the teachings of psychology combined with those of consciousness lead us to state this problem much more broadly; to prove that memory, as popularly understood, and as usually described by psychologists, so far from being memory in its entirety, is only one particular phase of it, though the highest and most complex, and that this, taken by itself and studied apart, cannot be fully understood; that it is the final term of a long evolution and, as it were, an efflorescence, whose root is found far back in organic life: in short, that memory is essentially a biological fact, and only by accident a fact of psychology.

Thus understood, our study involves a general physiology and psychology of memory, and at the same time its pathology. The disorders and diseases of this faculty, when classified and interpreted, are no longer an assemblage of curious facts and amusing anecdotes to be mentioned only incidentally: on the contrary, they are seen to be subject to certain laws which constitute the very groundwork of memory and which reveal its mechanism.

I.

In the common acceptance of the word, memory includes three things, viz.: the retention of certain states; their reproduction; their localization in the past. This, however, is only one kind of memory, and it may be designated *perfect*. These three elements are of unequal value: the first two are necessary, indispensable; the third, that which, in the language of the schools, is called "recollection," gives completeness to memory, but does not constitute it. Do away with the first two, and memory is abolished: suppress the third, and memory ceases to exist for itself, without ceasing to exist in itself. Hence this third element, which is purely psychological, appears as superadded to the others: they are permanent; it is instable, appearing and disappearing; it represents what consciousness may claim as its own in the fact of memory, and nothing more.

If we study memory as it has been studied down to our time, as a "faculty of the soul," with the aid of the *sensus intimus* (consciousness) alone, we must of necessity recognize in this perfect and conscious phase all that there is in memory; nevertheless that were, under the influence of a faulty method, to take a part for the whole, or rather the species for the genus. Some authors of our day—Huxley, Clifford, Maudsley, and others,—by maintaining that consciousness is only the accompaniment of some nervous processes, and that it is as incapable of reacting upon them as is a shadow of reacting on the footsteps of the wayfarer that it accompanies, have opened the way for the new theory which is here essayed. Let us set aside for the moment the psychic element, which will

be considered later; let us reduce the problem to its simplest terms, and see how, quite apart from consciousness, a new state is implanted in the organism, how it is retained, and how reproduced: in other words, how, apart from consciousness, a fact of memory has its rise.

Before we come to organic memory itself, we must note certain phenomena that have sometimes been compared to it. Authors have found analogues of memory in the inorganic world, and particularly "in the property possessed by light-vibrations, whereby they may be stored up on a sheet of paper, and there persist, for a longer or shorter time, in the state of latent vibrations, ready to reappear at the summons of a developing agent. Engravings exposed to the sun's rays and then kept in a dark place, can months afterward, by the aid of appropriate reagents, reveal persistent traces of the photographic action of the sun upon their surface."* Lay a key upon a sheet of white paper, and expose the two to the direct rays of the sun; then lay the paper away in a drawer, and years afterward the spectral image of the key will be visible.† In our opinion these and other like facts bear too remote an analogy to memory to merit being cited. In them we find the first condition of all recollection, namely, the retention of the impression, but that is all we find, for here the reproduction of the impression is in such a degree passive, and dependent on the intervention of an outside agency, that it bears no resemblance to the natural reproduction of memory. Furthermore, with regard to the matter before us, we must never forget that we have to do with the laws of life, not with physical laws, and that the foundations of memory must be sought in the properties of organized matter and not elsewhere. It will be seen later that they who overlook this fall into errors.

Neither will I dwell upon certain habits of plants, that have been compared to memory: I hasten to deal with facts of a more decisive character.‡

In the animal kingdom muscle tissue roughly illustrates the acquisition of new properties, their retention and their automatic reproduction. "Daily experience," says Hering, "shows that a muscle becomes stronger the

* Luys, "The Brain and its Functions."

† G. H. Lewes, "Problems of Life and Mind," Third Series, p. 57.

‡ Two facts observed by the Translator may, perhaps, serve to illustrate the persistence of impressions through diversified physical changes. A mass of beeswax that had been employed again and again, melted and re-melted, in an electrolyte toudry; which was all blackened with graphite, and had, apparently, lost forever the cell-structure of the honeycomb, was found to present on its surface, with great distinctness, the outlines of the polygonal cells. Again, a jar of raspberry conserve—the juice of the raspberry boiled, with the addition of sugar, presented the forms of the berries so distinctly that, with care, it was possible to separate one from the mass.

oftener it works. The muscle fiber which at first makes feeble response to the excitation transmitted by the motor nerve, responds more energetically the more frequently it is excited, pauses and rests being of course presupposed. After each action it is more fitted for action again, better prepared for the repetition of the same work, better adjusted for the reproduction of the organic process. It wins more by activity than by long repose. Here we have, in its simplest form,—in that which comes nearest to purely physical conditions—that faculty of reproduction which is found under so complex a form in nerve substance. And what we see in muscular tissue we see in greater or less degree in the substance of the other organs. We everywhere observe that an enhanced functional power of organs accompanies an increase of activity, with sufficient intervals of rest.*

The most highly developed tissue of the organism, nerve tissue, presents in the highest degree this two-fold property of retention and reproduction. Still, we will not seek in the most simple form of its activity, reflex action, the type of organic memory. Reflex action, indeed, whether it consists of an excitation followed by one contraction or by many, is a result of an anatomical arrangement. And it might be asserted, not without probability, that this anatomical arrangement, now innate in animals, is the product of heredity, that is to say, of a specific memory; that some time it was acquired, and then became fixed and organic through innumerable repetitions. We will not employ this argument in favor of our thesis, for there are many others far less open to question.

The true type of organic memory—and here we come to the very core of our subject—must be sought in that group of phenomena which Hartley so well named *secondary automatic actions*, as opposed to primary or innate automatic acts. These secondary automatic actions, or acquired movements, are the very groundwork of our daily life. Thus, locomotion, which in many lower species is an innate property, in Man has to be acquired—especially that power of coördination which maintains the body's equilibrium at each step we take, by combining tactual impressions with visual. It may be generally affirmed that in an adult the members and the sensorial organs act so freely as they do, only because of the sum of acquired and coördinated movements which constitute for each separate part of the body its special memory—the accumulated capital on which it lives, and by which it acts, just as the mind lives and acts by reason of its past experiences. To the same class belong those groups of movements of a more artificial character, which consti-

tute the apprenticeship of all manual trades, games of skill, various bodily exercises, etc.

If we inquire how these primary automatic movements are acquired, fixed and reproduced, we see that the first step consists in forming associations. The raw material, so to speak, is supplied by the primary reflex actions; these are to be grouped in a certain way, and some combined together, to the exclusion of others. Sometimes this period of formation is simply a long continued experimentation. Acts which now seem to us to be entirely natural, were originally acquired by most laborious effort. When the babe's eyes for the first time see the light, we notice an incoherent fluctuation of movements; a few weeks later coördination of the movements is effected, and the eyes can adjust themselves, can locate a luminous point, and follow its every movement. When a child is learning to write, observes Lewes, he cannot move the hand by itself, but must also move the tongue, the muscles of the face and even those of the feet.* But in time he learns to suppress these useless movements. Any one, on essaying for the first time any muscular act, expends a large amount of superfluous energy, which he afterward by degrees learns to restrict to what is simply necessary. The appropriate motions become fixed by exercise, to the exclusion of the others. There are formed in the nerve elements corresponding to the motor organs, secondary dynamic associations more or less stable (that is to say, a memory), and these are added to the primary and permanent anatomical associations.

If the reader will observe for a moment these secondary automatic actions, which are very numerous and fall under the cognizance of every one, he will see that this organic memory is like psychological memory in all respects, save one, viz., the absence of consciousness. If we sum up the characteristics of organic memory, the perfect resemblance between the two memories will clearly appear:

Acquisition, now instantaneous; again slow. Repetition of the act in some cases necessary, in others of no use. Inequality of organic memory in different persons: in some quick, in others slow or altogether refractory: awkwardness is the result of defective organic memory. In some persons there is permanence of associations that have once been formed: in others these are readily lost, forgotten. Arrangement of these acts in simultaneous or in successive series, just as in the case of conscious memory. A fact worthy of note in this connection is that each member of a series suggests the next following: this is what occurs when we walk without reflecting on the act. Soldiers on foot, and even horsemen in the saddle, overcome by sleep, have been able to keep on the march,

* Hering, "Ueber das Gedächtniss als allgemeine Function der organisirten Materie." 2c. Auflage. Wien: Gerold's Sohn, 1876, p. 13.

* Op. Cit. p. 51.

though the latter have continually to preserve their equilibrium. This organic suggestion is exhibited more strikingly still in the case mentioned by Dr. Carpenter* of an accomplished pianist, who executed a piece of music while asleep—a feat which we must credit less to the sense of hearing than to the muscular sense which suggested the succession of movements. But not to go in search of extraordinary cases, we find in our daily actions organic series, both complex and well-defined, that is, wherein the beginning and the end are fixed, and wherein the terms, all differing from one another, follow in a constant order, as in going up or down a stairway with which we are familiar. Our psychological memory takes no note of the number of steps; our organic memory notes it after its own fashion, as also the division by landings, the arrangement of the banisters and other details; it makes no mistake. May we not say that, for the organic memory, these well-defined series are strictly the analogues of a phrase, a couplet of verses, or an air in music for the psychological memory.

Thus, then, in its mode of acquiring, preserving and reproducing impressions we find organic memory identical with psychological. Consciousness alone is wanting. At first consciousness accompanied the motor activity, then it gradually disappeared. Sometimes—and such cases are the most instructive—the disappearance of consciousness is abrupt. A certain man subject to temporary suspense of consciousness would continue, while this condition lasted, any movement he might have begun. One day he walked straight into a body of water. Often—for he was a shoemaker—he would prick his fingers with his awl and go on with the movements of stabbing the awl through the leather.† In the epileptic vertigo called the “petit mal” such occurrences are of every day observation. A certain musician while playing the violin in an orchestra, was often seized with epileptic vertigo (momentary loss of consciousness) during the performance of a piece—“nevertheless he would keep on playing, and though absolutely unconscious of all around him, neither seeing nor hearing the musicians who accompanied him, he followed the measure.”‡ It is as though consciousness were teaching us just what part it plays, and showing its real value, and by disappearing suddenly, were proving that in the mechanism of memory it is a superadded element.

We have now in logical sequence to advance further, and to inquire what modifications of the organism are required for the establishment of memory, what changes the nervous system undergoes when a group of

movements is definitively organized. Here we come upon the last question that can be raised, without going beyond the region of facts, as to the organic bases of memory; and if organic memory is a property of animal life, whereof psychological memory is only a particular phase, whatever we shall discover or conjecture as to its ultimate conditions, will be applicable to memory in general.

It is impossible for us, in this inquiry, to forego resort to hypothesis. Still, by avoiding all *a priori* conceptions, by keeping close to facts, and taking our stand upon what is known in regard to nerve action, we escape all risk of serious error. Besides, the hypothesis we offer is capable of all sorts of modification. Finally, in lieu of a vague phrase touching the retention and reproduction of memory, it will substitute in our minds a distinct representation of the extremely complex process which produces and sustains it.

The first point to be established is that regarding the seat of memory. This question cannot now-a-days give occasion for any serious controversy. “We must regard it as well nigh demonstrated,” says Bain, “that the renewed feeling occupies the very same parts and in the same manner, as the original feeling.” To cite a striking example of this, experience shows that the persistent idea of a bright color fatigues the optic nerve. We know that the perception of a colored object is often followed by a consecutive sensation which presents the object with the same contours, but in a color complementary to the real color. The same may occur in regard to the idea (the recollection). That, too, leaves, though with a less degree of intensity, a consecutive image. If, with closed eyes, we keep for a length of time an image of very lively colors before the imagination, and then opening the eyes suddenly we fix them upon a white surface, we see thereon for an instant the image contemplated in imagination, but in the complementary color. This fact, as is observed by Wundt, from whom we borrow it, proves that the nerve action is the same in the two cases—in the sense-perception and in the memory.*

The number of facts and inductions that go to confirm this thesis is so great as to make it almost a certitude; and it would require weighty reasons indeed to refute it. In truth there is no such thing as memory but only memories; there is no one seat of memory, but special seats for each memory in particular. Memory is not, as the vague phrase of common speech has it, “in the soul;” it is fixed in its birth-place, in a part of the nervous system.

This premised, we begin to see our way more clearly through the problem of the physiological conditions of memory. These conditions we conceive to be as follows:

* For further details upon this point, see Bain, “The Senses and the Intellect.”

* “Mental Physiology,” § 75.

† Carpenter, “Mental Physiology,” p. 75.

‡ Trousseau, “Leçons Cliniques,” vol. ii, xli, § 2.

In the same passage are found many other facts of this kind. We will return to this subject when we come to treat of the pathology of memory.

1. A special modification impressed upon the nerve-elements.

2. An association, a special connection established between a certain number of these elements.

Authors have not given to this second condition the importance it deserves, as we shall endeavor to show.

To confine ourselves for a moment to organic memory, let us take one of those secondary automatic movements which have served us as types, and consider what takes place during the period of organization—for instance, the movements of the legs in walking.

Each movement requires the play of a certain number of muscles, superficial or deep-seated; of tendons, joints, ligaments, etc. These modifications—at least most of them—are transmitted to the sensorium. Whatever opinion one may hold upon the anatomical conditions of muscular sensibility, certain it is that it exists; that it tells us what part of the body is concerned in a movement, and that it enables us to regulate this movement.

Now what does this imply? It implies modifications received and retained by a determinate group of nerve-elements. "The movements that are instigated or actuated by a particular nervous center do, like the idea, leave behind them residua, which, after several repetitions, become so completely organized into the nature of the nervous center that the movements may henceforth be automatic."* "The residua of volitions, like the residua of sensations or ideas, remain in the mind and render future volitions of a like kind, more easy and more definite."† It is this organization of the "residua" which, after the period of experimentation already mentioned, enables us to perform movements with more and more ease and precision, till at last they become automatic.

In subjecting to analysis this very familiar instance of organic memory, we see that it implies the two conditions mentioned above.

The first condition is a special modification impressed upon the nerve-elements. As this has oftentimes been explained before, we shall not dwell long upon it. In the first place, the nerve-filament being *ex hypothesi* impressionless, does it, upon receiving an entirely new impression, retain a permanent modification? This is a moot point. Some authors see in the nerves a simple conductor the constituent material of which, being for a moment disturbed by an impression, returns again to its original state of equilibrium. Whether we explain the transmission by vibrations propagated along the axis-cylinder, or by a chemical decomposition of its protoplasm, it is difficult to believe that nothing of it remains. But however that may be, we find at least in the nerve cell the element

which, by general consent, receives, stores up and reacts. Now, an impression, once received, marks it with an imprint. Thereby, according to Maudsley, there is produced an aptitude and with it *differentiation* of the element, though we have no reason to suppose that originally that element differed from homologous nerve cells. "Every impression leaves a certain ineffaceable trace; that is to say, the molecules, once they are arranged otherwise and forced to vibrate in a different way, will not return exactly to their original state. If I brush the surface of still water with a feather, the liquid will not resume the form which it had before: it may again present a smooth surface, but molecules will have changed places, and a sufficiently penetrating eye would certainly discover therein evidence of the passage of the feather. Animal molecules that have been disarranged have thereby gained, in a greater or less degree, aptitude for undergoing disarrangement. Doubtless, if this same external agency does not again act anew upon the same molecules, they will tend to resume their own natural movement; but the case will be very different if they are again and again subjected to the same action. Then they will little by little lose the power of returning to their natural movement, and will become more and more identified with that which is impressed upon them, till at last it becomes natural to them in its turn, and they obey the slightest cause that will set them in vibration."*

It is impossible to define wherein this modification consists. Neither microscope nor reagents, neither histology nor histochemistry can throw light upon it; but facts and reason assure us that it exists.

The second condition, which consists in the establishment of stable associations between different groups of nerve-elements, has not hitherto attracted attention. I am not aware even that contemporary authors have recognized its importance; and yet it is a necessary consequence of their thesis upon the seat of memory.

Some of them appear to hold, implicitly at least, that a memory, either organic or conscious, is impressed upon a single cell which, with its nerve filaments, would seem to possess a sort of monopoly of retaining and reproducing it. What has contributed to keep up this illusion is, I conceive, the fashion of speech which requires us to look on a movement, a perception, a thought, an image, a sentiment, as *one* thing, as a *unit*. But reflection soon shows each of these supposed units to be made up of many and heterogeneous elements; that it is an association, a group, a fusion, a complex, a *multiplicity*. Take the example already cited—a locomotory movement. This may be regarded as a reflex action of great complexity, the initial

* Maudsley, "Physiology and Pathology of the Mind," p. 167.

† *Ibid.*, p. 157.

* Delbœuf, "Théorie Générale de la Sensibilité," p. 60.

impression of which is the contact of the foot with the ground each moment.

Let us consider this movement at first in its complete form. Is the starting point a voluntary act? Then, according to Ferrier, the impulsion that has its rise in a particular region of the cortex of the brain, traverses the white substance, passes into the corpora striata, through the crura cerebri, the protuberance, the complex structure of the medulla; thence going over to the other side of the body, where it descends along the antero-lateral columns of the spinal cord to the lumbar region, and thence along the motor nerves to the muscles. This transmission is accompanied or followed by a return to the centers through the posterior columns of the cord and the gray matter, the medulla, the pons Varolii, the optic tract and the white matter to the cortex of the brain. Let us consider this movement in its abridged and most ordinary form—when it is automatic. In that case, according to the commonly received hypothesis, the transit proceeds only from the periphery to the cerebral ganglia and back again to the periphery, the superior brain not being involved in the movement.

This movement, the principal stages of which we have roughly indicated, and all the details of which are not yet thoroughly known, even to the most learned anatomists, implies the calling into action of nerve-elements very numerous, and very diverse. Thus, the motor and the sensory nerves differ in their histological structure from the nerves of the brain and the spinal cord. The cells differ in volume, in form (there being fusiform cells, giant cells, pyramidal cells, etc.), in the directions in which they lie, in the number of their filaments, in their position in the several parts of the cerebro spinal axis, for they are distributed from the inferior extremity of the spinal cord to the cortical layers. All these elements play their respective parts in the concert of action. If the reader will glance at an anatomical chart, or at a few histological preparations, he will obtain an approximate idea of the enormous number of nerve-elements necessary to produce a movement, and consequently to retain and reproduce it.

We therefore hold it to be of the utmost importance to call attention to this point, viz., that organic memory supposes not only a modification of the nerve elements, but also the *establishment between them of associations adapted to each special action*—of certain *dynamic associations* which, by repetition become as stable as the primary anatomical connections. In our opinion the thing that is of importance, as supplying a basis for memory, is not only the modification impressed upon each element, but the way in which sundry elements are grouped together to form a complex.

As this point is for us of the first importance, we shall have no hesitation in dwelling

upon it. First, it will be observed, that our hypothesis, which is a necessary corollary of admitted facts regarding the seat of memory, simplifies certain difficulties, though at first view it may appear to complicate them. The question is asked, can each nerve cell preserve many different modifications; or, once modified, is it polarized forever after? Of course we are reduced here to conjecture; yet we may without rashness suppose that though it may be capable of many modifications, the number of these must be limited. So, too, we may suppose that it preserves only one. The number of the brain cells being 600,000,000, according to the calculation made by Meynert (and Dr. Lionel Beale gives a very much higher number), the hypothesis of a single impression is in no wise inadmissible. But this question is of secondary interest for us, for even though we accept the latter hypothesis—the most unfavorable one for explaining the number and complexity of acts of organic memory—we should find that this single modification, being capable of entering into different combinations, may produce different results. We are to note not only each factor individually, but the relations of all the factors to one another, and the combinations thence resulting. The modified cell may be compared to a letter of the alphabet. This letter, while it continues to be the same, has concurred in forming millions of words in the living and dead languages. Combinations innumerable and of the highest complexity may result, through grouping, from a small number of elements.

To return to our instance of locomotion: The organic memory that serves as its basis consists of a special modification of a multitude of nerve elements. But several of these elements, thus modified, may subserve another purpose, may enter into other combinations, may take a part in other memories. The secondary automatic movements that constitute swimming or dancing presupposes certain modifications of the muscles, certain articulations already employed for locomotion, already registered in certain nerve elements; in short, they find a memory already organized, sundry elements of which they turn to their own advantage, causing them to enter into a new combination and to concur in forming another memory.

Further, we would observe, that the necessity of a great number of cells and nerve filaments for the retention and reproduction of a movement, though the same be a comparatively simple one, implies a greater possibility of permanence and reviviscence; in consequence of the number of the elements and of the solidarity established between them, the chances of reviviscence are increased, each one tending to call forth the others.

Finally, our hypothesis is in agreement with two facts of daily observation, viz.:

- I. An acquired movement that is well fixed

in the organism, firmly *retained*, is displaced only with great difficulty by another, having nearly the same seat, but involving a different mechanism. In fact, one association has to be broken up to form another; established relations have to be annulled to set up new ones.

2. It sometimes happens that, in lieu of one accustomed movement, we involuntarily perform another; this is accounted for by the fact that as the same elements enter into different combinations capable of producing nerve-discharges in different directions, a trifling circumstance may suffice to call into activity one group instead of another, so producing different effects. Thus at least do we explain the following fact, reported by Lewes (Op. Cit., p. 128): "I was one day relating a visit to the Epileptic Hospital, and, intending to name the friend, Dr. Bastian, who accompanied me, I said, 'Dr. Brinton,' then immediately corrected this with 'Dr. Bridges;' this also was rejected, and 'Dr. Bastian' was pronounced. I was under no confusion whatever as to the persons, but, having imperfectly adjusted the group of muscles necessary for the articulation of the one name, the one element which was common to that group and to the others, namely, B, served to recall all three." The explanation seems entirely correct, and we may note with the author another familiar fact which favors our theory: "Who does not know," says Lewes, "how, in trying to recollect a name, we are tormented with the sense of its beginning with a certain letter, and how, by keeping this letter constantly before the mind, at last the whole group emerges." A like observation may be made with regard to the acquired movements that constitute the act of writing. It is a mistake I have often found myself falling into, especially when writing rapidly and with a wearied brain; it is so trifling, so quickly corrected and so quickly forgotten, that I have had to make a note of it at the moment. Here are some instances: Intending to write the words "*doit de bonnes*," I wrote "*donne*." Intending to write "*ne pas faire une part*," I wrote "*ne part faire*," etc. Evidently, in the first case the letter D, and in the second the letter P (and by letter I mean the psycho-physiological state which serves as the basis for their conception and graphic representation), called forth one group instead of another; and this confusion was all the easier as the remainder of the groups, "*onne*" and "*art*," were already in the consciousness. Doubtless any one who will take the trouble of observing his own practice in these respects will admit that such errors are of frequent occurrence.

What has been said is hypothetical, but the hypothesis appears to be in agreement with scientific data, and to account for the facts. It enables us to contemplate in pretty definite shape the bases of organic memory,

of those acquired movements which constitute the memory of our several organs—our eyes, our hands, our members. These bases do not, in our opinion, consist in a purely mechanical registration, nor, as the usual comparison would have it, in an impress preserved we know not where, like the image of the key already mentioned. These are similes borrowed from the world of physics and are out of place here. Memory is a biological fact. A rich and well-stored memory is not a collection of impressions, but an assemblage of dynamic associations, very stable and very readily called forth.

II.

We are now to study a more complex form of memory, that which is accompanied by consciousness, and which in ordinary language, and even in the language of psychologists is regarded as the sum total of memory. We have to inquire how far what has just been said of organic memory applies to this, and what is added by consciousness.

In passing from the simple to the complex, from the lower to the higher, from a stable form of memory to an instable one, we must not overlook the preliminary question of the relation between the unconscious and consciousness. So involved is this problem in its native obscurity and in artificial mysticism, that it seems difficult to say anything clear and decisive about it; but we shall try.

Of course we have nothing to do with the metaphysics of the unconscious, as understood by Hartmann and others; we shall even begin by confessing that we know not how to explain the transition from the unconscious to consciousness. One may offer ingenious, plausible hypotheses upon the subject, but nothing more. However, psychology, as a science of facts does not need to concern itself with these points; it takes consciousness for granted, without caring for its genesis; all that it can do is to determine a few of its conditions of existence.

The first of these is the mode of action of the nervous system, called by physiologists nervous discharge. But most nerve states do not awaken consciousness at all, or but rarely, and in an indirect way: for instance, the excitations and discharges whose seat is the great sympathetic; the normal action of the vaso-motor nerves; a great many reflex actions, etc. Others are accompanied by consciousness intermittently; or, though they are conscious in the early period of life, they cease to be so in the adult; instance the secondary automatic actions already mentioned. Nerve action is far more widely distributed than psychic activity: all psychic acts involve nerve action, but the proposition is not reciprocally true. Between the nerve activity that is never, or hardly ever, accompanied by consciousness, and the nerve activity that is always, or nearly always, so accompanied, stands that which sometimes

has for its concomitant consciousness. It is in this group of facts that the unconscious must be studied.

Before we arrive at clearer and better-grounded conclusions on this subject, we would note two other conditions of consciousness, viz., intensity and duration.

1. Intensity is a condition of highly variable character. Our states of consciousness are ever striving to supplant one another, but victory may result equally either from the superior strength of the victor or from the weakness of the other contestants. We know—and this point has been very well elucidated by the school of Herbart—that the most vivid state of consciousness may grow steadily fainter till at last it falls below the level of consciousness, in other words, till one of its conditions of existence fails. We are justified in affirming for consciousness all possible degrees down to the lowest, to the state called by Maudsley sub-conscious; but there is no warrant for maintaining that this descending scale has no end, though we may not discern it.

2. Duration, as a necessary condition of consciousness, has not received much attention; yet it is of the first importance. On this point we can reason from definite data. The researches of the last thirty years have determined the time that is required for the different sense-perceptions, (hearing 0.16 to 0.14 sec., touch, 0.21 to 0.18 sec., sight, 0.20 to 0.22 sec., and for the simplest act of discernment, that nearest to reflex action 0.02 to 0.04 sec.). Though the results vary according to the experimenter, the person under experiment, the circumstances and the nature of the psychical acts that are being investigated, so much is at least established, viz., that every psychical act requires an appreciable duration, and that the supposed infinite rapidity of thought is only a figure of speech. From this it follows that no nervous action, the duration of which is less than that required by psychic action, can awaken consciousness. An instructive comparison may be made between the nervous act accompanied by consciousness, and simple reflex action. According to Exner* the time necessary for a reflex action is 0.0662 to 0.0578 sec., which is much less than that stated above for the different sense-perceptions. If, as Herbert Spencer observes, the wing of a gnat makes from ten to fifteen thousand beats in a second, each involving a separate nervous act, we have nerve action of astounding rapidity, compared with which nervous acts accompanied by consciousness occupy an enormous length of time. From all this it follows that since every act of consciousness necessarily requires

a certain duration, one essential condition of consciousness is wanting whenever the duration of a nervous process falls short of that minimum.*

The question of the unconscious is obscure and beset with contradictory opinions, simply because it is incorrectly stated. If we look on consciousness as an entity, as a fundamental attribute of the soul, all becomes obscure; if we consider it as a phenomenon having its own conditions of existence, all becomes clear, and the unconscious is no longer a mystery. We must never forget that a state of consciousness is a complex fact which supposes a special state of the nervous system; that this nervous action is not a mere accessory but an integral part of the fact; that it is its base, its fundamental condition; that given the nervous action the fact exists in itself; that, consciousness being added, the fact exists for itself; that consciousness completes it, perfects it, but does not constitute it. If one of the conditions of consciousness be wanting, as intensity, or duration, or any other unknown to us, then a part of the complex whole—consciousness—disappears; but another part—the nervous process—remains. All that is left of the fact is its purely organic phase. It is not surprising, therefore, if later the results of this cerebral activity turn up; such activity there was, though it was not noted.

Regarded from this point of view, the whole subject of unconscious action loses its mysterious character, and is readily explained, for example, the sudden in-rush of recollections, apparently called up by no association, that occurs daily to every one; the lessons read by a schoolboy at night, known by heart in the morning; problems long studied, the solution of which bursts suddenly on the consciousness; poetical, scientific, and mechanical inventions; secret sympathies, etc. Unconscious cerebration does its work noiselessly, and reduces obscure ideas to order. In a curious case mentioned by Carpenter,† a

* The researches as to the duration of psychic acts may throw new light upon certain facts of our mental life. Thus they help, I think, to explain the transition from the conscious to the unconscious in habits. An act is at first performed slowly, consciously; by repetition it becomes easier and is executed more rapidly, *i. e.*, the nervous process which is its basis, finding its course fully traced for it, takes place rapidly and by degrees falls below the minimum duration required for consciousness.

† "Mental Physiology," p. 533. The whole chapter xiii contains interesting facts about unconscious cerebration. A mathematician, a friend of the author, had been occupied with a geometrical problem, and had had a glimpse of the solution. He reverted to it again and again without success. Many years afterward the solution occurred to him so suddenly that he "trembled as if in the presence of another being who had communicated the secret." If any one would witness the spectacle of a powerful and penetrating mind hampered by a faulty method, he must read Sir William Hamilton's remarkable study of "Latency," ("Metaphysics," vol. i, lect. xviii). With his theory of the faculties of the soul, and his willful disregard of all physiology, he is unable to escape from any difficulty.

* Pflüger's "Archiv," viii (1874), p. 526. The duration of reflex actions varies according to the force of the stimulus, and the direction of the transmission, whether longitudinal or transverse, in the spinal cord. But this question is by no means cleared up.

man was vaguely cognizant of the work going on in his brain, without having distinct consciousness. "A business man in Boston having an important question under consideration, had given it up for the time as too much for him. But he was conscious of an action going on in his brain which was so unusual and painful as to excite his apprehensions that he was threatened with palsy, or something of that sort. After some hours of this uneasiness, his perplexity was all at once cleared up by the natural solution of his doubts coming to him—worked out, as he believed, in that obscure and troubled interval."

To sum up, we may regard the nervous system as being traversed by continuous discharges. Of these nervous actions some answer to the incessant rhythm of the vital activities; others, much fewer in number, to the succession of states of consciousness; still others, and these are by far more numerous, constitute unconscious cerebration. The six hundred (or the twelve hundred) million cells, and the four thousand or five thousand millions of fibers, even allowing for those which are inactive or remain during the whole period of life without occupation, offer a considerable contingent of active elements. The brain is a sort of busy workshop where ten thousand different operations are going on at once. Unconscious cerebration not being subject to the conditions of time, and taking place so to speak only in space, may act in different places simultaneously. Consciousness is the narrow wicket through which a very small portion of all this work becomes visible to us.

We now see wherein consists the relation of consciousness to the unconscious, and by that very fact we have a definite idea of the relation of psychic to organic memory: the former is only one phase of the latter. In a general sense, what has been said of physiological memory applies to conscious memory: there is simply the addition of one factor. Still it will be of advantage to consider the question anew, and in detail. Here again we have to examine two things, namely the residua and the groups they form.

I. The old theories of memory, as they contemplated only its psychological aspects, assigned for its only basis "vestiges," "traces," "residua," and often erred in employing these terms in an ambiguous sense, signifying now material impressions on the brain, again latent modifications retained in the "soul." Those who adopted the latter opinion were logical. But this theory, though it numbers many partisans among those who stand aloof from physiology, is untenable. A state of consciousness that is not conscious, a representation that is not represented, is simply a form of speech, and nothing more. To eliminate from a thing that which constitutes it what it is, is to reduce it to a simple possibility; that is to say, when the conditions

in which it exists reappear, the thing will reappear too. And this brings us back to what was said above with regard to the unconscious.

For us, the question of "psychological residua" is settled beforehand; for if every state of consciousness implies as an integral part of itself nerve action, and if this nerve action modifies the nerve centers in a permanent way then the state of consciousness too is recorded in those centers. True, it may be objected that a state of consciousness implies nerve action and *something more*. That makes little difference. If the original nervous state—perception—sufficed to call up this something more, the secondary nervous state—recollection—equally suffices. The conditions are the same in the two cases; and the solution of this difficulty, if solution there be, is incumbent on a theory of perception, not on a theory of memory.

We may with Wundt call this psychophysiological residuum an arrangement, and with him point out wherein it differs from an impress. "Certain analogies taken from the domain of physiology bring out this difference clearly. In the eye that has been exposed to intense light the impression received persists in the shape of a consecutive image. The eye which daily compares and measures distances and relative positions in space becomes more and more exact. The consecutive image is an impress: the accommodation of the eye, its power of measuring distances, is a functional arrangement. The retina and the muscles may be formed in the unpracticed eye just as they are in the practiced, but there is in the latter a far more marked anatomical arrangement than in the former. No doubt we may say that physiological use and want of organs depends less upon their changes properly so-called than on the impresses that persist in their nervous centers; but all physiological researches into the phenomena of habit, of adaptation to conditions, etc., show that here too impresses consist essentially of functional arrangements."

II. These considerations bring us to the point upon which we desire to lay stress. The dynamic associations of the nerve elements play a still more important part in conscious memory than in organic memory. We might repeat what has been said above; but this side of the question has been so little studied that it is best to consider it again under another form.

Every one finds in his consciousness a number of recollections: of men, animals, cities, landscapes; facts of science, of history, of language, etc. These recollections recur to us in the shape of series, longer or shorter. The formation of these series has been very well explained by the laws of association between states of consciousness, and to that

* "Grundzüge der Philosophischen Psychologie," p. 791.

explanation we have nothing to add. What interests us is, not the series but the terms of which they are composed. We want to get at the simple state of consciousness, in order to show what complexity it involves.

Let us take then one of these terms—the recollection of an apple, for instance. If we are to believe the dictum of consciousness, this is a very simple fact, but physiology shows this to be an error. The recollection of an apple is necessarily the weakened form of the perception of an apple. What does this perception imply? A modification of the retina, which is the nerve terminus of a highly complex structure; transmission through the optic nerve, and the corpora geniculata to the tubercula quadrigemina; thence to the cerebral ganglia (optic tract?); through the white matter to the cortex. This involves the calling into action of many different elements, lying along an extended route. Yet this is not all. It is not a question of a mere color-sensation. We see, or think we see the apple as a solid object of spherical form. These judgments result from the exquisite muscular sensibility of our visual organ and from its movements. But the movements of the eye are governed by sundry nerves, as the sympathetic, the oculomotor communis and the oculomotor externus. Each of these nerves terminates at a particular point in the medulla, which is itself connected with the cortex of the brain where originate what Maudsley calls the motor intuitions. We give only the outlines; for details the reader may consult anatomical and physiological treatises. Thus an idea may be formed of the enormous number of nerve filaments and nerve cells scattered in groups through the different parts of the cerebro-spinal axis, that serve as a basis for the psychic state—the recollection of an apple—which by the twofold illusion of language and consciousness we are led to regard as so simple.

It will, perhaps, be objected that a visual perception is highly complex, and proves too much in favor of our thesis. Take, then, the recollection of a word. If it be a written word, the recollection is visual, and the case is analogous to the preceding. But if it be a spoken word, the complexity is equally great. Articulate language presupposes the cooperation of the larynx, the pharynx, the mouth, the nasal passages, and consequently of several nerves having their centers in divers parts of the medulla, viz.: the spinal, facial and hypoglossal nerves. And if you assign to auditive impressions a place in the recollection of words, the complexity is still greater. Finally, the medullary center must itself be connected with Broca's convolution and the region of the insula, both of which are universally regarded as the psychic center of speech. It is seen that this case differs neither in kind nor in the degree of its complexity from the preceding, and that the re-

collection of each separate word must have for its basis a definite association of nerve elements.*

There is no need to dwell upon this point: from what has been said we see the importance of those associations which I shall call the *dynamic bases* of memory, the modifications impressed upon the elements being the static bases. It will, perhaps, be said that our examples suppose cases simpler still: true, but we need not concern ourselves with them. What memory preserves and reproduces, is concrete actual states of consciousness; we had, therefore, to regard them as such, and to select instances from that order of facts. Physiological analysis and ideological analysis, descending, each from its own side, to the ultimate elements, are of service in explaining the genesis of states of consciousness: but here we consider them as formed. When we are learning to talk, we employ a few simple words: later, we make use of a few phrases. For a long time we know not that these words imply elements simpler still: many men never know it. Now consciousness, which is an inner speech, acts in the same way: that which for it is simple, analysis shows to be complex. But no doubt the simple states that are the alphabet of consciousness, themselves presuppose, for their retention and their reproduction, certain complexes of nerves. The examples already cited with regard to letters and syllables prove this. A still more curious one is cited by Dr. Forbes Winslow: A well-educated man, after an attack of fever and ague, lost all the knowledge of the letter F.†

Hence if we would portray to ourselves a good memory and translate that expression into the language of physiology, we should have to picture to ourselves a great many nerve elements, each modified in its own way, each taking part in an association, and, perhaps, adapted to enter into many associations, each association comprising the conditions of states of consciousness. The memory thus has static bases and dynamic bases. Its power is in proportion to the number of these and their stability.

III.

We are now to study the special character of the psychic memory, that which is peculiarly its own, and which, while making no change in its nature or its organic conditions, constitutes it the highest, the most complex, and the most instable form of memory. This character is, in the language

* Forbes Winslow, "On the Obscure Diseases of the Brain," 4th edition, p. 257, mentions the case of a soldier who, having undergone the operation of trephining, lost a portion of his brain. Some time afterward it was noticed that he had forgotten the numbers *five* and *seven*, and those only. After a time he recovered his memory of these two numbers.

† *Op. cit.* p. 258. The author does not tell us whether it was the articulation or the graphic sign, or both, nor whether the patient recovered.

of the schools, called recollection. I shall call it Localization in Time, that term implying no hypothesis and being simply the expression of the facts.

There are few questions that the method of "mental faculties" has so perplexed with difficulties and with far-fetched explanations as this. It will, therefore, be well at the outset briefly to indicate how, from our point of view, the question is stated and how it is settled.

Localization in time (for example the recollection that such or such an accident befell us at such a time and in such a place) is not a primary act. It supposes, in addition to the principal state of consciousness, secondary ones varying in number and degree which, being grouped around it, determine it. Perhaps the mechanism of "recollection" is best explained by the mechanism of vision.

The distinction between primary and acquired visual perceptions has been recognized ever since Berkeley's time. We know that the primary datum of the sensation of sight is a colored surface; that the secondary data are direction, distance, form, etc.; that the former is dependent above all on the sensibility of the retina, while the latter depend mainly on the muscular sensibility of the eye; that by force of habit the primary and acquired have become so blended together that they seem to constitute one simple ultimate act, though the opposite is proved by analysis, by experiment and by divers pathological cases. So with regard to memory. The primary state of consciousness is originally given as simply existent: the secondary states of consciousness superadded to it, and which consist of relations and judgments, localize it at a certain distance in time, so that memory may be defined *seeing in time*.

This operation which, for clearness' sake we have thus roughly described, must now be studied* more closely and in detail.

The theoretical explanation of localization in time starts from the law formulated by Dugald Stewart, and so well explained by Taine,* that the acts of the imagination are always accompanied by a belief, at least momentary, in the actual existence of the object to which they relate. This belief, which is most pronounced in hallucination, in vertigo and in dreaming (because there are no actual perceptions to correct it) exists, though in a less degree, with respect to all states of consciousness whatever. I say nothing here of the mechanism by which the state of consciousness is stripped of its objective reality and reduced to a simple conception of the mind. On this point I refer the reader to the explanations offered by Taine.†

Still this is not a recollection. So long as an image, whatever it may stand for—a house,

a mechanical invention, or a feeling—remains isolated, and, as it were, suspended in the consciousness, having no relation to other states that for us have a fixed place, and not being localizable by us—we see therein only an actual state of consciousness. But among such images there are some that possess the property, so soon as they enter the consciousness, of ramifying in different directions, of reawakening states of consciousness that connect them with the present, and thus they occur to us as forming a part of a longer or shorter series terminating in the present. In other words, they are localized in time.

I shall not inquire whether it is memory that makes the idea of time possible, or whether it is the idea of time that makes memory possible; neither shall I discuss the question whether time be an *a priori* form of the mind, nor whether memory be explicable by an empiric genesis. These questions have a place in a critique of knowledge, not in an empiric psychology, which has nothing to do with these critical or ontological discussions; it ascertains as a fact that time implies memory, and that memory implies time, and is content. This conceded, how do we localize in time?

Theoretically, only one course is open to us. We determine positions in time, as we do positions in space, by referring to a fixed point, and as regards time, this fixed point is the present moment. We may observe that this present moment is a real state, having its duration-quantity. Brief as it is, it is not, as the metaphors of ordinary language would have it, a flash, a nothing, an abstraction, like a mathematical point: it has a beginning and an ending. Further, its beginning does not appear to us as an absolute beginning: it is in contact with something with which it is continuous. When we read or hear a sentence, there remains at the utterance of the fifth word, for example, something of the fourth. Each state of consciousness is effaced only by degrees; it leaves a trail like what, in physiological optics, is called the consecutive image (after-sensation, *Nachempfindung*). Thus, then, the fourth and the fifth words are continuous—the end of one being in contact with the beginning of the other. This is the main point. There is a contiguity, not indefinite, meaning that any two ends are in contact, but such a contiguity that the beginning of the actual state of consciousness is in contact with the ending of the state that preceded it. This simple fact once clearly apprehended, we have the *theoretical* mechanism of localization in time, for it is plain that the retrograde movement may also be made from the fourth word to the third, and so on; and that each state of consciousness having its own duration-quantity, the number of states of consciousness thus traversed regressively, and their duration-quantities give the position of any given state relatively to the present

* "On Intelligence." In this work will be found a collection of facts which leave no doubt on this point.
† Op. Cit., particularly Part II, Book 1, ch. ii.

moment—its distance in time. Such is the theoretical mechanism of localization; a retrogression which, starting from the present, traverses a longer or shorter series of terms.

Practically, we have recourse to simpler and more expeditious processes. We very rarely perform this retrogression through all of the intermediate terms of the series, seldom even through the greater part of them. We simplify the operation by the employment of reference points.

I take a familiar example to illustrate: On the 30th of November I am expecting a book I greatly need. It comes from a distance, and cannot arrive in less than twenty days from the time of ordering it. Did I order it early enough? After trying in many ways to fix the date, I remember that I ordered the book on the day before I set out on a little journey, and the date of that I can determine precisely as Sunday, November 9th. The recollection is now perfect. If we analyze this case, we shall see that the principal state of consciousness—ordering the book—was at first something referred indefinitely to the past. It calls up secondary states, and compared with these, it is seen to precede some, to be subsequent to others. "The image," says Taine, "glides to and fro on the line of the past; each of the phrases pronounced mentally has given it a new oscillation."* At last it finds its place; it is now fixed, known. In this illustration the recollection of the journey is what I call a reference point. By reference point I mean any occurrence, any state of consciousness whose position in time we know, *i. e.*, its distance with respect to the present moment, and which serves as a measure of other distances in time. These reference points are states of consciousness which, from their intensity, withstand oblivion better than others, or which from their complexity are adapted to call up many associations and to increase the chances of reviviscence. They are not selected arbitrarily, but force themselves upon us. Their value is purely relative. They retain this character for a day, a week, a month; but then, not coming into use, they are forgotten. As a rule they are purely individual in character, though some of them are common to a family, to a small community, to a nation. If I am not mistaken, they constitute for each individual different series answering pretty closely to the different occurrences that make up his life—his daily occupations, family events, professional occupations, scientific researches, etc., these series being more numerous in proportion as the life of the individual is more diversified. These reference points are like milestones set up on highways which, starting from one point diverge in various directions. But they possess this peculiarity,

that these series may, as it were, come into juxtaposition so as to be compared.

We have now to show how these reference points enable us to simplify the mechanism of localization. The event which we call a reference point, since, according to the hypothesis, it comes very often into consciousness, is very often compared to the present as regards its position in time—in other words, the states intermediate between the two and separating them, are called up with greater or less distinctness. The result is that the position of the reference point is, or seems to be (and we shall later see that every recollection implies an illusion) better and better known. By repetition this localization becomes immediate, instantaneous, automatic. It is like the forming of a habit. The intermediate points disappear, being of no use: the series is reduced to two terms, and these two terms suffice, because their distance from each other in time is known. Were it not for this *short cut*, the vast number of intermediate terms being disregarded, localization in time would be a very lengthy and difficult process, restricted within narrow limits. But by the aid of this, so soon as an image appears, its primary localization is instantaneous: it stands between two fixed points, namely, the present moment and some reference point. The operation is completed after a few trials, and is often laborious, and fruitless, and perhaps never precise.

If the reader will examine his own recollections, he will, I think, raise no serious objection to what has just been said. Further, he will observe how close is the resemblance between the process here employed, and that whereby we localize objects in space. In the latter case also we have reference points, short cuts, and distances fully ascertained, which we employ as units of measurement.

A few words may also be devoted, not without profit, to showing that localization in the future is effected by a similar process. Our knowledge of the future cannot be anything but a repetition of the past. Here I find only two categories of facts. They are either a mere reproduction of what has already occurred at similar epochs in the same places, under the same circumstances; or they consist of inductions, deductions and conclusions drawn from the past, but produced by the logical working of the mind. Outside of these two categories everything is possible, but everything is unknown.

Plainly the first of these classes of facts is the one that most closely resembles memory, for it involves simply the reproduction of what has been. Suppose a man has been wont every year to pass the month of September in a country house. In the depth of winter he sees it with its surroundings, its inmates, its daily routine. The image is at first indeterminate: it belongs equally to the past and to the future. First, it separates

*Taine, "On Intelligence," Part II, Book 1, ch. II, § vi. A good analysis of this mental operation is given by Taine.

itself from the present; then it glides past winter, spring and summer; at last it becomes localized. The course of the year, with its succession of seasons, holidays, changes of occupation, supplies reference points. This process differs from memory only in one respect, namely, that here we pass from the *terminal* limit of the present, to the *initial* limit of the following state: we do not proceed, as in recollecting, from the beginning of one state of consciousness to the ending of another, but from an ending to a beginning. In this unchanging order we traverse, theoretically, all the intermediate states of consciousness, but practically we traverse only a few landmarks. The process is accordingly the same as in memory, only it works in the reverse direction.

In short, setting aside verbal explanations, we find that "recollection" is no "faculty" at all but a fact, and that this fact is the result of a sum of conditions. Hence, "recollection"—localization in time—varies with these conditions through all possible grades. In the highest grade are the reference points; next below these are vivid, well defined recollections, referred to their place in time past almost as quickly; then those that involve some hesitation, and require an appreciable time; lower still, labored recollections that take definite shape only after effort and resort to stratagem; last of all come those cases where all effort fails, and our indecision is expressed in such phrases as, "It seems to me that I have seen this form;" "have I seen this in a dream?" One step further, and localization fails altogether: the image, stripped of its defining circumstances possesses nothing by which it can be definitely referred to any fixed time. There are many examples of this last case and they are to be found where we should least expect them. From the effects of disease or of old age, celebrated authors sometimes forget their own writings. Linné, toward the close of his life, took pleasure in reading his own works, and would exclaim, as he read, forgetting that he was himself the author: "Beautiful! I wish I had written that." The like is told of Newton and the discovery of the differential calculus. Walter Scott as he grew old was subject to this kind of forgetfulness. One day a poem was read to him which gave him pleasure, and he asked who was the author. It was a canto from his "Pirate." Ballantyne, who was his secretary and who wrote his life, relates in minute detail how the greater part of "Ivanhoe" was dictated during a painful illness. It was completed and published before its author had quit his bed. He had no recollections of it beyond the central idea of the story, which had antedated his illness.

In a case cited by Forbes Winslow, the image seems to be just on the point of being recognized, localized, but it falls short: "The poet Rogers, when ninety years of

age, was out driving with a lady. She inquired of him about another lady whom he could not recollect. He pulled the check-string and appealed to his servant. 'Do I know Lady M.?' The reply was 'Yes sir.' This was a painful moment to us both. Taking my hand, he said: 'Never mind, my dear. I am not yet compelled to stop the carriage and ask if I know you.'"⁺

A much more instructive instance is recorded by Macaulay in his essay on Wycherley. Wycherley's memory, says he, was, toward the end of his life, at once exceedingly strong and exceedingly weak. If anything was read to him in the evening he would awake the next morning, his mind full of the ideas and the expressions heard the night before. He would write them out in perfect good faith, not doubting that they were his own. Here the mechanism of memory is plainly cut in twain, and pathology gives us its analysis. Interpreting this case according to the principles stated above, we should say: the modification impressed upon the brain-cells persisted; the dynamic associations of the nervous elements remained stable; the state of consciousness attaching to each was awakened; these several states of consciousness were again associated and again formed into series (sentences or verses). But there the mental operations suddenly stopped. These series did not awaken any secondary state; they remained isolated, without any relation to the present, without anything to fix their place in time. They remained as mental images, and they appeared new, because no concomitant state impressed on them the stamp of the past.

So far is localization in time from being a simple, primary, instantaneous act, that very often it requires a measurable interval even for consciousness. Where it appears to be instantaneous its rapidity is a result of habit. The eye, too, judges of the distance of objects, and it is probable that for nascent memory, as for nascent vision, localization is never instantaneous.†

Thus then we have discovered in the highest form of memory only one new operation—localization in time. We have now in conclusion to show the relatively illusory character of this operation.

* Laycock, "Personal and Organic Memory;" Carpenter, op. cit., p. 444; Ballantyne, "Life of Walter Scott;" Spring, "Symptomatology," vol. 11, p. 530; Forbes Winslow, op. cit., p. 247.

† Note also what happens when events are many times repeated. I have made the journey from Paris to Brest a hundred times. The impressions of all these journeys overlap each other in my mind, forming a confused mass; properly speaking they constitute one vague image. Among them all, the journeys that are associated with some important event, whether fortunate or unfortunate, alone occur to me as recollections; only those which awaken secondary states of consciousness are localized in the mind, are recognized. The reader will observe that our explanation of the mechanism of "recollections" agrees with that given in Taine's "Intelligence," Part 2, Book 1, chap 11, § 6.

As I write I have a very vivid recollection of a visit I made a year ago to an old castle in Bohemia. The visit lasted two hours. To-day I easily make it over again in imagination: I enter at the great doorway, I pass in due order through the courts, corridors, halls and chapels as they rise story above story: I see again their frescoes and their decorations just as they are; I make my way fairly through this labyrinth of an old castle down to the moment of leaving, but I am unable to fancy the duration of this imaginary visit as equal in length to the two hours this moment just elapsed. It seems much shorter, and the difference would be much greater if the two hours just past had been spent in another visit of the same kind, or in some agreeable company. If we declare the two periods to be of equal length we do so on the evidence of time-pieces and in disregard of the evidence of our consciousness.

Every recollection, however distinct, suffers an enormous amount of abridgement: this fact is indisputable and has no exceptions. Scientific experiments in very simple cases, where the chances of error are inconsiderable, confirm this law. Vierordt has proved that if we try to imagine fractions of a second of time, our idea of any given fraction is always too large: the reverse holds when there is question of several minutes or several hours. In order to study the duration of these small intervals, he had the beats of a metronome noted for some time by a person who was required afterward to repeat the beats with the same rapidity. In the repetition the interval between the beats was too long when the original interval was short, and too short when the original interval was long.*

In proportion to the complexity of the states of consciousness the error increases. And what adds to the difficulty is the fact that this does not take place according to any appreciable law. It cannot be said to be in proportion to the length of time that may have elapsed; indeed we may assert the contrary. If I were to represent the last ten years of my life by a line one meter in length, the year just past would occupy three or four tenths of that line; the fifth, which was crowded with events, would take two-tenths; the other eight would be compressed within the remainder.

The same illusion is seen in history. Some centuries appear longer than others, and if I am not mistaken, the period from our day back to the taking of Constantinople seems longer than the period from that event back to the first crusade, though the two periods are very nearly equal in length of time. This probably results from the fact that the former

period is better known to us, and that in it our own recollections are involved.

As the present merges into the past, our states of consciousness disappear and are obliterated. Reviewed after the lapse of a few days, little or nothing of these remains; most of them have vanished into nothingness, never to be recalled, and they have taken with them the quantity of duration inherent in them; consequently an effacement of states of consciousness is an effacement of time. Now the "short cuts" processes already spoken of presuppose this effacement. If, in order to recollect something in the distant past we had to go over the whole series of terms between now and then, memory were impossible, owing to the length of time the operation would require.*

Thus we reach the paradoxical result that forgetfulness is a condition of memory. Were it not for our totally forgetting a vast number of states of consciousness and momentarily forgetting a great many, we could not recollect anything. Forgetfulness therefore is not, except in certain cases, a disease of memory, but rather one condition of its healthful action and of its life. In this we find a striking analogy with the two great vital processes. To live is to gain and to lose; life consists as much in the work that eliminates as in that which assimilates. Forgetfulness is elimination.

A second result (and this brings us back again to the functions of vision) is that our knowledge of the past is like a painting with perspective reaching far into the distance, at once deceptive and true, for its truth is based on illusion. If on a hypothesis that never will be realized we could compare our actual past as it was, set objectively before us, with the subjective representation of the same furnished to us by memory, we should see that this copy is constructed on a particular system of projection; each of us readily finds his bearings in this system, for it is of his own making.

IV.

Thus we have reached, step by step, the highest development of memory; we will now follow the inverse order and come again back to our starting-point. This return is necessary, in order to show a second time that memory is a process of organization in

*Vierordt, "Der Zeitsinn nach Versuchen," 36—111. H. Weber, "Tastsinn und Gemeingefühl," 87, has made analogous experiments on visual perceptions. See also "Handbuch der Physiologie" (1879), edited by Hermann, vol. II. part 2, p. 282.

*Abercrombie, in his "Intellectual Powers," mentions a circumstance which confirms what is here said: "The late Dr. Leyden was remarkable for his memory. I am informed, through a gentleman who was intimately acquainted with him, that he could repeat correctly a long Act of Parliament, or any similar document, after having once read it. When he was, on one occasion, congratulated by a friend for his remarkable power in this respect, he replied that, instead of an advantage, it was often a source of great inconvenience. This he explained by saying that, when he wished to recollect any particular point, in anything which he had read, he could do it only by repeating to himself the whole from the commencement till he reached the point which he wished to recall."

varying degrees between two extreme limits, namely, a new state and organic registration.

There is no form of mental activity that bears witness more effectively in favor of the theory of evolution: from that point of view, and from that alone, can we understand the nature of memory; and it is seen that the study of memory must be not only a study in physiology, but also in morphology, *i. e.* a history of its transformations.

Let us then take up the question where we left it. A new mental acquisition more or less complex is revived for the first or for the second time. Such recollections are the most instable of the elements of memory—so instable that many of them vanish for good; such are most of the occurrences that happen to us daily and hourly. However clear, however intense, they have a minimum of organization. But every time they return to the mind, whether voluntarily or involuntarily, they gain in stability—their tendency to become organized grows stronger.

Below this group of fully conscious and unorganized recollections stands the group of conscious and semi-organized recollections; for example a language we are by degrees learning, a scientific theory or a handicraft that we have only half mastered. Here the strongly individual character of the first group disappears, and the recollection becomes more and more impersonal—becomes objective. The localization in time disappears, being useless. Here and there a few isolated terms carry with them personal impressions which localize them. I remember having learned such a German or English word in such a town, or under such circumstances. It is a *survival*, a *mark* of a prior state, an original impress. Little by little it is effaced, and the term assumes the same commonplace and impersonal character as all other terms.

This knowledge of a science, a language, a handicraft becomes more and more rooted. It retreats by degrees from the psychic sphere, and becomes more and more like an organic memory. Such, in the case of an adult person, is his memory of his mother tongue.

One step lower, and we come to memory completely organized and nearly unconscious, as seen in the clever musician, the skilled mechanic, the accomplished danseuse. Nevertheless, all this was once memory in the strict and ordinary sense of the word—fully conscious memory.

We may go lower still. The exercise of every one of our senses (of sight, of touch; in walking, etc.), presupposes a completely organized memory; but so incorporated is it in our nature that most persons never suspect it to be acquired. The same can be said of many of our habitual judgments. No one *remembers* that the object at which he is looking has an opposite side; or that a certain modification of the visual impression implies a certain distance; or that a certain

motion of the legs will move *him* forward; or that the thing which he sees moving about is a live animal. It would be thought a misuse of language were any one to ask another whether he *remembered* that the sun shines, that fire burns, that iron is hard, and that ice is cold.* Nevertheless, all this, we repeat, was once memory in the strict sense, in a nascent intelligence.

It is not necessary to add that the foregoing is a purely ideal sketch, a schematism. It were vain to endeavor to define with precision the several stages of an evolution that proceeds by infinitesimal transitions varying according to the individual.

Can we go further still? We might. Below the composite reflex actions which represent organic memory in its lowest phase we have simple reflex actions. We may conceive the latter—which are the result of a congenital anatomical arrangement—as being themselves acquired and made fixed by innumerable experiences in the course of the evolution of species. Thus we should pass from the memory of the individual organism (*individual memory*) to heredity, which is the memory of the species (*specific memory*). It is enough to simply refer to this hypothesis.

In fine it is impossible to say where memory, whether psychic or organic, ends. That which we designate by the collective name, memory, comprises series exhibiting all degrees of organization, from the nascent to the perfect state. There is incessant transition from the stable to the instable; from the state of consciousness, where acquisition is precarious, to the organic state, where acquisition is assured. In consequence of this steady tendency toward organization, a degree of simplification and order is given to the contents of memory which makes a higher form of thought possible. But the tendency to organization, left to itself, without a check, would tend to the progressive annihilation of consciousness; would reduce man to an automaton.

Suppose—though the hypothesis is one that cannot be realized—suppose an adult human being placed in such conditions that he has no more new states of consciousness—no new sensations, ideas, concepts, sentiments, or desires: the different series of states of consciousness which constitute each form of psychic activity would at last become so well organized as to make him a hardly conscious automaton. Narrow minds that always move in the same ruts reduce this hypothesis to a reality in some degree. Restricted within a narrow sphere, they have very little contact with what is new and strange, and hence tend toward the state of perfect stability; they become mere machines; so far as the greater part of their life is concerned, consciousness is superfluous.

* Herbert Spencer, "Psychology," Part IV., *op. cit.*, § 192.

Having considered the subject in all its aspects, we revert to the proposition stated at the outset, viz.: conscious memory is only a special phase of biological memory. We may now, by recourse to another class of considerations, show once more that memory is subject to the fundamental conditions of life.

All forms of memory, from the highest to the lowest, have for their groundwork dynamic associations between the nerve elements, and special modifications of these elements, at least of the cells. These modifications, resulting from a first impression, are retained by no inert matter—they do not resemble the impress of a seal on wax. They are impressed upon living matter. Now all living tissues are ever in process of molecular renewal, nerve tissue more than any other, and in nerve tissue the grey substance more than the white, as is proved by the extraordinary abundance of bloodvessels pervading it. Now, since the modifications persist, it follows that the arrangement of the molecules of new-formed tissue must exactly reproduce the type of the effete molecules to which they succeed. Memory is directly dependent on nutrition.

But not only have these cells the property of self-nutrition: they also possess, at least during a portion of their life, the power of reproduction, and we shall later see how this fact accounts for certain cases of the re-establishment of memory. All physiologists hold this reproduction to be simply a form of nutrition: therefore the basis of memory is nutrition—the vital process *par excellence*.

For the present I will not dwell upon this point. After we have considered the disorders of memory, its exalted and its depressed states, its momentary suspension, its eclipse and sudden return, its progressive impairment, we may return to the question with advantage: the capital importance of nutrition will then be self evident. Hitherto we have been occupied with the preliminaries of our subject—memory in its healthy state; it is time to study it in the morbid state. The pathology of memory is the complement of its physiology; we shall see whether it lends confirmation to it.

CHAPTER II.

GENERAL AMNESIA.

Classification of the diseases of memory—Temporary amnesia—Epileptics—Forgetfulness of certain periods of life—Examples of re-education—Slow and sudden recoveries—Case of provisional memory—Periodical or intermittent amnesia—Formation of two memories, totally or partially distinct—Cases of hypnotism recorded by Macnish, Azam and Dufay—Progressive amnesia—Its importance; reveals the law which gov-

erns the destruction of memory—Law of regression; enunciation of this law—In what order memory fails—Counter-proof; it is reconstituted in inverse order—Confirmatory facts—Congenital amnesia—Extraordinary memory of some idiots.

Material for the study of the diseases of memory is found scattered through medical works, treatises on mental diseases, and the writings of divers psychologists. It may be brought together without overmuch labor, and then we have at hand a sufficient store of observations. The difficulty is to classify, to interpret, to draw conclusions as to the mechanism of memory. In this respect the facts gleaned are of very unequal worth; the most extraordinary ones are not the most instructive. The physicians to whom we are indebted for most of them have described them almost exclusively with reference to their own art. In their eyes a disorder of memory is but a symptom, and they note it as such; it is of use as a guide in diagnosis or prognosis. So with regard to classification; they content themselves with a reference of each case of amnesia to the morbid state whose effect it is—brain softening, hemorrhage, concussion, etc.

For our purpose, on the other hand, the diseases of memory must be studied in themselves as morbid psychic states which may enable us the better to understand the normal state. As for classification we must needs ground it upon likenesses and differences. The subject has not yet been sufficiently studied to attempt a natural classification, *i. e.*, by causes; I would therefore remark that the classification here offered is designed simply for the purpose of reducing to something like order a confused and heterogeneous mass of facts; that in many respects it is arbitrary, I am free to confess.

Disorders of memory may be restricted to one single class of recollections, all the rest remaining intact, at least apparently; these are *partial* disorders. Others, on the contrary, affect the entire memory in all its forms; cut the mental life in twain or break it up into many fragments; or destroy it utterly by agencies that work step by step: these are *general* disorders.

We thus recognize, in the first place, two great classes, the general and the partial diseases of memory. The former alone will be considered in this chapter. We propose to consider them under the following heads: 1. Temporary Amnesia; 2. Periodic Amnesia; 3. Progressive Amnesia, least curious of all, but most instructive; 4. Congenital Amnesia.

I.

Temporary amnesia usually comes suddenly and disappears in the same way. It lasts for a period of time that may vary from five minutes to years. The briefest and clearest cases, as also the most common, occur in epilepsy.

Physicians are not agreed either as to the nature, the seat or the causes of this disease. The problem does not belong to our subject, nor is it within our province. Suffice it to say that authors with one accord recognize three forms of the disease: "grand mal," "petit mal," and vertigo; that they regard these less as distinct varieties than as degrees of the same morbid state; finally, that the milder the disease in its external manifestation, the graver its effects on the mind. The fit is succeeded by mental derangement which may betray itself by oddities and absurd acts, or by crimes. All these acts possess a common character called by Hughlings Jackson *mental automatism*. They leave no recollection, save in rare cases, where a few faint traces of memory remain.

A patient while advising with his physician is seized with epileptic vertigo. He recovers immediately, but forgets that he paid the fee a moment before the attack.* A clerk finds himself seated at his desk, his thoughts slightly confused, but otherwise without ailment. He remembers having ordered dinner at a restaurant, but from that moment forward he has no recollection of anything. He goes back to the restaurant, and there learns that he has eaten dinner and paid the bill, and that he left for his office without appearing to be ill. In this instance memory was in abeyance for about three quarters of an hour. Another epileptic, seized with a fit in a shop, falls to the floor, rises again, and runs away leaving behind his hat and notebook. "I was found," said he "a quarter of a mile away; I inquired for my hat in all the shops, but I was unconscious of what I was doing, and did not come to myself again till ten minutes later, when I reached the railroad." Trousseau relates the case of a magistrate who, while attending a meeting of a learned society in the Hotel de Ville, Paris, went out bare-headed, walked as far as the Quai, and returned to his place to join in the discussions, without any recollection of what he had done.

Oftentimes the patient keeps on performing, during the period of automatism the acts in which he may have been engaged at the moment of the attack, or he comments upon something he may have been reading. Instances of this were given in the preceding chapter. Nothing is more common than unavailing attempts at suicide, but when the fit of epileptic vertigo has passed there is no recollection of them whatever. The same is true with regard to criminal attempts. A shoemaker seized with epileptic mania on his wedding day, killed his father-in-law by stabbing him with his knife. Coming to his senses a

few days afterward, he had not the faintest suspicion of what he had done.

From these examples the reader may get a better understanding of the nature of epileptic amnesia than from any general description of it. A certain period of mental activity is as though it had never been. The epileptic knows of it only from the testimony of others, or from vague conjectures. Such is the fact. As for its psychological interpretation, there are two possible hypotheses.

Either (1) the period of mental automatism was unaccompanied by consciousness, and in that case the amnesia needs no explanation, for as nothing was produced, so nothing can be retained or reproduced; or (2) there was consciousness, but so faint that amnesia ensues. This second hypothesis I believe to be the true one in a great many instances.

In the first place, as a matter simply of reasoning, it is difficult to see how very complex acts adapted to different ends can be performed without some measure of consciousness at least intermittent. Be the force of habit as great as you please, it must for all that be remembered that if where uniformity of action exists consciousness tends to disappear; on the other hand, it tends to manifest itself wherever there is diversity of action.

But reasoning can give only possibilities; experience alone is decisive. Now there are facts which go to prove the existence of a certain measure of consciousness even in the exceedingly numerous cases where the epileptic retains no remembrance of his paroxysm. "Some epileptics, on being questioned abruptly and in a commanding tone, reply in a low and plaintive voice. When the attack has passed, they recollect neither what has been said to them nor what they have themselves answered. . . . A child, forced during an attack to inhale ether or ammonia, the odor of which was to it unbearable, would angrily cry out, 'go away, go away!' When the fit was over, the patient had no recollection of these occurrences. . . . Sometimes epileptics contrive, after much effort, to recall sundry occurrences that took place during the paroxysms, particularly those of the last few moments of the seizure. . . . In that case they are in a situation comparable to that of one awakening out of a distressing dream. At first the main circumstances of the attack escape them, and they disclaim all knowledge of the acts imputed to them; but little by little they recall sundry details which at first they seemed to have forgotten."*

If in these cases circumstances go to prove that consciousness existed, it is not rash to assert its existence in many other cases. I do not mean to assert that this holds for all cases. The magistrate mentioned above directed his steps with sufficient discretion to

* The facts here cited are taken for the most part from a memoir by Dr. H. Jackson, published in the *West Riding Asylum Review*, and from an article by Falret on the mental state of epileptics, in the *Archives de Médecine*, December, 1860, April and October, 1861.

*Trousseau, 'Leçons Cliniques.' Vol. II.: p. 114.

avoid obstacles vehicles and passers-by, and this indicates a certain consciousness; but in a similar case mentioned by Hughlings Jackson, the patient was thrown down by an omnibus, and on another occasion came near falling into the Thames.

How then are we to explain amnesia in cases where consciousness exists? By the extreme feebleness of the states of consciousness. There are only two means of giving fixity to a state of consciousness, viz.: intensity and repetition. The latter is reducible to the former, for repetition is a sum of lesser intensities. Here there is neither intensity nor repetition. The mental disturbance which follows the paroxysm is very well defined by Jackson when he calls it "an epileptic dream." One of his patients, nineteen years of age, and a person very unlikely to dogmatize on the subject, of his own accord hit upon the same expression. "Last time he had a fit and went to bed, and when in bed said, 'Wait a bit, Bill, I am coming.' He went down stairs; he unbolted the doors, and went out in his night-shirt. He came to himself just as he was stepping on the cold stones, and then his father touched him. He said he had had a dream. 'It's all right, *I have had a dream!*'"

In order to proceed from the known to the unknown, let us compare the mental state of epileptics with that of a dreamer. Dreams of which all recollection disappears instantly, are very common. We awake in the night out of a dream; the recollection of the interrupted dream is very clear; next morning not a trace remains. Who is there who has not tried over and over, in vain, to recall some dream of the previous night, of which he remembers nothing, except that he has had a dream?

The explanation is simple. The states of consciousness that make up a dream are extremely faint. They appear to be strong, not because they really are so, but because there is no strong state of consciousness to force them into the background. So soon as the waking state begins again everything resumes its own place. Images fade away in the presence of sense perceptions, these in the presence of a state of fixed attention, and this in the presence of a fixed idea. In short, consciousness during dreams has a minimum intensity.

Hence the difficulty is to explain why, during the period following an epileptic seizure, consciousness falls to a minimum. Neither physiology nor psychology can explain it, for neither science knows anything about the conditions of the genesis of consciousness. The problem is the more embarrassing because amnesia attaches to the delirium of epilepsy and to that delirium only, as we see in the case of those who are both epileptics and victims of alcoholism. A patient is seized with an epileptic fit during the day; he smashes everything within reach, and is vio-

lent in every way. After a brief period of quiet, he falls during the night into alcoholic delirium, which is characterized by frightful visions. Next day, coming to himself, he distinctly recollects the delirium of the night before, but has no remembrance of the delirium of the preceding day.

There is still another difficulty. If the amnesia is due to the weakness of the primary states of consciousness, how comes it that these faint states of consciousness determine the patient to acts? According to Hughlings Jackson, "mental automatism results from over action of low nervous centers, because the highest or controlling centers have been put out of use." We have here only an illustration of a well-known physiological law, viz., that the excito-motor power of the reflex centers increases when their connection with the superior centers is broken.*

Let us consider only the psychological problem: a solution of that is possible. If we insist on making consciousness a "force" self-existent and self-acting, everything becomes obscure. But if we hold, as was explained in the preceding chapter, that consciousness is a concomitant of a nervous state, and that this nervous state is the fundamental element, all becomes clear. At least it is no contradiction to say that a nervous state sufficient to determine certain acts is insufficient to awaken consciousness. To produce a movement and to produce a state of consciousness are two distinct and independent facts; the conditions of the one are not those of the other.

In conclusion, we may note that the inevitable consequence of repeated epileptic seizures, especially those of epileptic vertigo, is a progressive weakening of memory in its entirety. We shall later study this form of amnesia.

We now pass to cases of temporary amnesia of a destructive character. In the examples already cited, the capital accumulated down to the moment of the seizure is not impaired; the only effect is that something that was in the consciousness does not remain in the memory. In the examples which follow, a part of the capital is lost. Such cases make most impression on the imagination. Possibly some day, as physiology and psychology advance, they will from these cases teach us much regarding the nature of memory; just now these facts are not the most instructive—at least, in my estimation, whatever they may disclose to others.

These cases differ widely from one another. Sometimes the suspension of memory

* "A highly important character of epileptic mania," says Falret, *loc. cit.*, "is the absolute likeness of all the attacks in the same patient, not only their likeness as a whole, but in every detail. The same patient expresses the same thoughts, utters the same words, performs the same acts. There is a surprising uniformity in all the paroxysms.

begins at the onset of the disease, covering events that happen thereafter; again, it covers the events occurring just previous to the seizure; generally it extends in both directions, both to the time before and the time after the attack. Sometimes memory returns spontaneously, suddenly; sometimes slowly and with some little assistance; sometimes the loss of memory is total and the patient has to learn everything over again. We will present instances of all these different phases.

"A young woman, wedded to a man she loved passionately, was seized in child-bed with a long syncope, at the termination of which it was found that she had lost all memory of the time after and including her marriage. All the rest of her life down to that moment she remembered quite distinctly. At first she repelled her husband and her child, when presented to her. She never was able to regain the memory of that period of her life, nor of the events belonging to it. Her relatives and friends succeeded, by reasoning with her and by the force of their testimony, in persuading her that she had been married, and was a mother. She credited them, preferring to believe that she had lost the memory of a year, rather than to hold them all to be impostors. But her own convictions, her own inmost consciousness had no part in this. She saw before her her husband and her infant, but could not imagine by what magic she had won the one or given birth to the other."*

Here we see an instance of incurable amnesia, extending only backward in time. As for its psychological explanation, that is to be found in the destruction of the residua and the impossibility of their reproduction. In the following case, reported by Laycock, the amnesia extends forward only, and hence is to be attributed only to the fact that the states of consciousness cannot be registered and preserved. The engineer of a steamship had a fall upon his back, striking the back of his head against some hard object. For a while he lay unconscious. Coming to himself, he soon regained perfect physical health; he retained recollection of all the years preceding the accident, but from that moment forward memory no longer existed, even concerning facts strictly personal. On reaching the hospital he could not say whether he had come afoot, in a carriage or by railroad. On leaving the dinner table he forgot that he had taken that meal; he had no idea what hour, or day, or week it might be. He would strive to reflect so as to answer questions, but in vain. His speech was slow, but his language was correct. He says what he intends to say, and he reads correctly. This infirmity of mem-

ory gave way before suitable medical treatment.*

As a general rule, in cases of temporary amnesia, due to concussion of the brain, a retroactive effect is produced. The patient, on returning to consciousness, is found not only to have lost the recollection of the accident and the period succeeding it, but also to have forgotten a longer or shorter period prior to it. Many instances might be quoted in confirmation of this; I will cite only one, mentioned by Carpenter. †

A Mr. H. "was driving his wife and child in a phaëton, when the horse took fright and ran away; and, all attempts to pull him in being unsuccessful, the phaëton was at last violently dashed against a wall, and Mr. H. was thrown out, sustaining a severe concussion of the brain. On recovering, he found that he had forgotten the *immediate* antecedents of the accident; the last thing he remembered being that he had met an acquaintance on the road, about two miles from the scene of it. Of the efforts he had made and the terror of his wife and child he has not to this day any recollection whatever."

We next give some cases of amnesia of a far more serious character, some of them necessitating a complete re-education: I take them from the English magazine, "Brain."

The first observation, reported by Dr. Mortimer Granville, was made in the case of a hysterical woman twenty-six years of age, who, after over-exerting herself, was seized with a violent fit, accompanied with total loss of consciousness. "When consciousness began to return, the latest sane ideas formed previous to the illness mingled curiously with the new impressions received, as in the case of a person awakening slowly from a dream. When propped up with pillows in bed near the window, so that persons in the street could be seen, the patient described the moving objects as 'trees walking'; and when asked where she saw these things, she invariably replied, 'in the other Gospel.' In short, her mental state was one in which the real and ideal were not separable. Her recollections on recovery, and for some time afterward, were indistinct, and, in regard to a large class of common topics which must have formed the staple material of thought up to the period of the attack, memory was blank. Special subjects of thought immediately anterior to the malady seemed to have saturated the mind so completely that the early impressions received after recovery commenced were imbued with them, while the cerebral record of penultimate brain-work in the life before the morbid state, was, as it were, obliterated. For example; although this young woman had supported herself by daily duty as a governess she had no recollection of so simple a matter as the use of a

* "Lettre de Charles Villiers à G. Cuvier." (Paris, Lenormant, 1802).

* Laycock, on "Certain Disorders and Defects of Memory." Page 12.

† Op. Cit., p. 450.

writing implement. When a pen or pencil was placed in her hand, as it might be thrust between the fingers of a child, the act of grasping it was not excited, even reflexly; the touch or sight of the instrument awoke no association of ideas. The most perfect destruction of brain-tissue could not more completely have effaced the constructive effect of education and habit on the cerebral elements. This state lasted some weeks.* Memory of what had been forgotten was recovered slowly, painfully, though there was no necessity for so complete a re-education as in the next case.

The second observation, which we owe to Professor Sharpey, furnishes one of the most curious instances of re-education ever recorded. I take from his long article only the psychological details. Here, too, the subject was a woman twenty-four years of age, and of delicate constitution, who for some six weeks suffered from an irresistible tendency to fall asleep. This condition grew more pronounced from day to day. About June 10 it was impossible to awaken her. She continued thus for two months. She was fed with a spoon, and swallowed the food: when she had had enough, she closed her teeth and turned her mouth away. She appeared to distinguish flavors, for she steadily refused certain kinds of food. At long intervals she had brief moments of waking. She answered no questions and recognized nobody, save once when she recognized "an old acquaintance, whom she had not seen for more than twelve months. She looked steadfastly in this person's face for a few seconds, apparently occupied in trying to remember his name, which at length she found out and repeated again and again, at the same time taking him by the hand as if overjoyed to see him. She then again fell into her slumber." Toward the end of August she returned little by little to her normal state.

Here began the work of re-educating her. "On her recovery from the torpor, she appeared to have forgotten nearly all her previous knowledge; everything seemed new to her, and she did not recognize a single individual—not even her nearest relatives. In her behavior she was restless and inattentive, but very lively and cheerful; she was delighted with everything she saw or heard, and altogether resembled a child more than a grown person.

"In a short time she became more sedate, and her attention could be longer fixed on one object. Her memory, too, so entirely lost, as far as regarded previous knowledge, was soon found to be most acute and retentive with respect to everything she saw or heard subsequently to her disorder, and she has by this time recovered many of her former acquirements, some with greater, others with less facility. With regard to these, it is re-

markable that though the process followed in regaining many of them apparently consisted in recalling them to mind with the assistance of her neighbors rather than in studying them anew, yet even now she does not appear to be in the smallest degree conscious of having possessed them before.

"At first it was scarcely possible to engage her in conversation; in place of answering a question, she repeated it aloud in the same words in which it was put, and even long after she came to answer questions she constantly repeated them once over before giving her reply. At first she had very few words, but she soon acquired a great many, and often strangely misapplied them. She did this, however, for the most part in particular ways; she often, for instance, made one word answer for all others which were in any way allied to it. Thus, in place of 'tea,' she would ask for 'juice,' and this word she long used for liquids. For a long time, also, in expressing the qualities of objects, she invariably, where it was possible, used the words denoting the very opposite of what she intended, and thus she would say 'white' in place of 'black,' 'hot' for 'cold,' etc. She would often, also, talk of her arm when she meant her leg, her eye when she meant her tooth, etc. She now generally uses her words with propriety, although she is sometimes apt to change her terminations or compose new ones of her own.

"She has as yet recognized no person, not even her nearest connections; that is to say, she has no recollection of having seen or known them previous to her illness, though she is aware of having seen them since, and calls them either by their right names or by those of her own giving, but she knows them only as new acquaintances, and has no idea of what relations they sustain to herself. She has not seen above a dozen people since her illness, and she looks on these as all that she has ever known.

"Among other acquirements, she has recovered that of reading; but it was requisite to begin with the alphabet, as she at first did not know a single letter. She afterward learned to form syllables and small words, and now she reads tolerably well, and has shown herself much interested in several stories previously unknown to her, which she has read since her recovery. The re-acquisition of her reading was eventually facilitated by singing the words of familiar songs from the printed page, while she played on the piano. In learning to write she began with the most elementary lessons, but made much more rapid progress than a person who had never before been taught. Very soon after the torpor left her she could sing many of her old songs, and play on the pianoforte with little or no assistance, and she has since continued to practice her music, which now affords her great pleasure and amusement. In singing, she at first generally required to be helped

* "Brain," Oct. 1879, p. 317, seqq.

to the first two or three words of a line, and made out the rest apparently from memory. She can play from the music book several tunes which she had never seen before; and her friends are inclined to think that she now plays and sings fully as well, if not better, than she did previously to her illness. She learned backgammon, which she formerly knew, and several games at cards, with very little trouble; and she can now knit worsted, and do several other sorts of work; but with regard to all these acquirements, as already mentioned, it is remarkable that she appears not to have the slightest remembrance of having possessed them before, although it is plain that the process of recovery has been greatly aided by previous knowledge, which, however, she seems unconscious of having ever acquired. When asked how she had learned to play the notes of music, from a book, she replied that she could not tell, and only wondered why her questioner could not do the same.

"She has once or twice had dreams, which she afterward related to her friends, and she seemed quite aware of the difference betwixt a dream and a reality; indeed, from several casual remarks which she makes of her own accord, it would appear that she possesses many general ideas of a more or less complex nature, which she has had no opportunity of acquiring since her recovery."^{*}

So far as we may judge from Dr. Sharpey's narrative this re-education did not take more than three months; nor is that an unexampled circumstance. "A clergyman, of rare talent and energy, of sound education, was thrown from his carriage and received a violent concussion of the brain. For several days he remained utterly unconscious, and when restored his intellect was observed to be in a state similar to that of a naturally intelligent child. Although in middle life, he commenced his English and classical studies under tutors, and was progressing satisfactorily, when, after several months' successful study, his memory gradually returned, and his mind resumed all its wonted vigor and its former wealth and polish of culture."[†]

"A gentleman about thirty years of age, of learning and acquirements, at the termination of a severe illness, was found to have lost the recollection of everything, even the names of the most common objects. His health being restored, he began to re-acquire knowledge like a child. After learning the names of objects, he was taught to read, and, after this, began to learn Latin. He made considerable progress, when, one day, in reading his lesson with his brother, who was his teacher, he suddenly stopped and put his hand to his head. Being asked why he did so, he replied, 'I feel a peculiar sensation in my head; and now it appears to me that I

knew all this before.' From that time he rapidly recovered his faculties."^{**}

I hold it sufficient, for the present, to lay these facts before the reader. The remarks they suggest will find more suitable place elsewhere. I shall conclude with a case little known, which marks the natural transition to intermittent mania. We shall, in fact, see gradually formed a provisional memory, and this again suddenly disappearing before the original memory.

A young woman, robust and healthy, accidentally fell into a river and was nearly drowned. She was insensible for six hours and then returned to consciousness. Ten days afterward she fell into a profound stupor which lasted four hours. On opening her eyes she no longer recognized any one, and she was deprived of hearing and speech, taste and smell. She retained only sight and touch, and these senses were of extreme sensibility. Ignorant of everything, and unable to stir, she was like an animal deprived of its brain. She had a good appetite, but she had to be fed; she ate all sorts of food indifferently, swallowing it in purely automatic fashion. Indeed, so strictly automatic was her whole activity that for days her only occupation consisted in unraveling, picking or clipping into minute pieces everything that came to her hand, as flowers, paper, clothing, etc., and then arranging the scraps to form certain rude patterns. Later her friends supplied the materials for making patchwork, and after a few preparatory lessons she took up the needle and worked incessantly from morning till night, making no distinction between Sunday and week-day, and even unable to perceive the difference. She retained no recollection of events from one day to another, and each morning she began a new task. Still, like an infant, she was beginning to register a few thoughts and to acquire some experience. She was next put at work of a little higher character, worsted work. She seemed to take great pleasure in gazing at the patterns with their flowers and their harmony of colors; but each day she would commence a new piece, forgetting that of the day before, unless it was set before her.

The thoughts derived from her former experience that seemed to be first reawakened, were connected with two matters that had made a strong impression upon her, namely, the fall into the river and a love affair. When a landscape was shown her containing a river or a view of a troubled sea, she became greatly agitated, and forthwith would have an attack of spasmodic rigidity accompanied by insensibility. So great was the fright given her by the sight of water, especially water in motion, that pouring water from one vessel into another was enough to make her tremble. It was observed that when

* "Brain," April, 1879.

† Forbes Winslow, *op. cit.*, p. 317.

* *Ibid.*

she washed her hands, she simply dipped them in the water, as gently as possible.

From the beginning of her malady the visits of a young man to whom she was attached gave her evident pleasure, even while she was insensible to everything else. He came regularly every evening, and she always looked for his arrival. At a time when she could not recall any occurrence an hour after it had happened, she used to look anxiously for the door to open at the accustomed hour, and if he did not come, she would be ill-humored the rest of the evening. On being taken into the country, she became low-spirited, irritable, and her paroxysms were frequent. But while the young man remained near her, her intellectual faculties and her memory were visibly improved.

This return of her faculties was going on gradually all the time. One day seeing her mother much grieved, she suddenly exclaimed, after a moment's hesitation, "What is the matter?" From that moment forth she began to articulate a few words, though she called neither persons nor things by their true names. The pronoun "this," was her favorite word, and she applied it to all sorts of objects, animate and inanimate alike. The first objects she called by their own names were wild flowers, for which she had shown a strong liking from her childhood. At this period she had as yet no recollection whatever of the places or the persons associated with her early years.

"The mode of recovery of this patient was quite as remarkable as anything in her history. Her health and bodily strength seemed completely reestablished, her vocabulary was being extended, and her mental capacity was improving, when she became aware that her lover was paying attention to another woman. This idea immediately and very naturally excited the emotion of jealousy; which, if we analyze it, will appear to be nothing else than a painful feeling connected with the idea of the faithlessness of the object beloved. On one occasion this feeling was so strongly excited that she fell down in a fit of insensibility, which resembled her first attack in duration and severity. This, however, proved sanatory. When the insensibility passed off, she was no longer spell-bound. The veil of oblivion was withdrawn; and, as if awakening from a sleep of twelve months' duration, she found herself surrounded by her grandfather, grandmother, and their familiar friends and acquaintances. She awoke in the possession of her natural faculties and former knowledge, but without the slightest remembrance of anything which had taken place in the year's interval from the invasion of the first fit up to the present time. She spoke, but she heard not; she was still deaf, but, being able to read and write as formerly, she was no longer cut off from association with others. From this time she rapidly improved, but for a while

continued deaf. She soon perfectly understood by the motion of her lips what her mother said; they conversed with facility and quickness together, but she did not understand the language of the lips of a stranger. She was completely unaware of the change in her lover's affections, which had taken place in her state of 'second consciousness,' and a painful explanation was necessary. This, however, she bore very well; and she has since recovered her bodily and mental health."^{*}

We shall see further on, when we shall have traversed all the facts, what general conclusions as to the mechanism of memory are to be drawn from its pathology. For the moment we shall restrict ourselves to a few observations suggested by the foregoing facts.

In the first place we would remark that the cases just cited, though classed by physicians under the general head of total amnesia, in reality belong, from the psychological point of view, to two different morbid types.

The first type (represented by the cases observed by Villiers, Laycock, Mortimer Granville, etc.) is by far the more frequent. We have given only a few examples, so as not to weary the reader with monotonous and unprofitable repetition. What characterizes this type, psychologically, is the fact that here the amnesia attaches only to the least automatic and least organized forms of the memory. In cases belonging to this morbid group neither the habits nor skill in any handicraft, as sewing or embroidery, nor the power of reading or writing, or speaking one's own or other languages, disappears; in short, memory in its organized or semi-organized form, remains intact. The destruction of memory in these cases affects only its highest and most instable forms, those personal in character and which, being accompanied by consciousness and localization in time, constitute that which in the preceding chapter we called psychic memory proper. It is further to be remarked that the amnesia covers the most recent events—extending backward from the present over a period of variable duration.† This may at first cause surprise, for our latest recollections would seem to be the most vivid, the strongest. But, in fact, this result is perfectly natural, the stability of a remembrance being in a direct ratio to its degree of organization. But I will not dwell upon this point, which will be considered at length elsewhere.

The physiological reason of amnesia in this group is purely hypothetical, and it probably is different in different cases. First (as we see especially in Laycock's observator)

^{*} Dunn, in the "Lancet," 1845. See Carpenter, *op. cit.* p. 460, *et seq.*

† I must, however, mention a case reported by Brown-Séquard, where a patient, in consequence of an attack of apoplexy, lost recollection of five years of his life. These five years, which included the time of his marriage, ended just six months before the date of his attack.

the power of registering new experiences is temporarily suspended; states of consciousness disappear as quickly as they appear, leaving no trace. But what becomes of the recollections registered previously for weeks, and months and years? They persisted, they were preserved and were recalled formerly; they seemed to be a lasting acquisition, yet in their place is now a void. This the patient fills by device and indirectly from the testimony of others and from his own reflections, thus more or less satisfactorily connecting his present with what remains to him of his past. It does not appear from the observations made that he ever fills this void by a direct reminiscence. Hence two suppositions are equally warranted; viz., that either the registration of the prior states has been effaced; or that the retention of the anterior states persisting, their aptitude for being revived by associations with the present is destroyed. We are not in a position to decide between these two hypotheses.

The other, and less frequent morbid type is represented in the cases reported by Sharpey and Winslow (that observed by Dunn marks a transition to intermittent amnesia). Here the work of destruction is complete: memory in all its forms—organized, semi organized, and conscious—is done away. There is complete amnesia. As we have seen, the authors who have described it compare the patient to an infant and his mind to a *tabula rasa*. These expressions, however, are not to be taken in the strict sense. The cases of re-education which we have cited show that though all prior experience is made null, there yet remain in the brain some few latent aptitudes. The extreme rapidity of the new education, especially in its later stages, were otherwise inexplicable. Facts tend to prove beyond question that this recovery of aptitudes, which seems the work of artifice, is above all the work of nature. The memory returns because the atrophied nerve elements are in time succeeded by other nerve elements possessing the same properties, whether original or acquired, as those they succeed. This is another proof of the relation which subsists between memory and nutrition.

Finally—for all cases of amnesia cannot be reduced to one formula—in cases where the loss and the recovery of memory are sudden we readily perceive the analogues of those phenomena of arrest of function or "inhibition," now closely studied by physiologists, but of which very little is known.

II.

The study of periodical amnesia is far better calculated to throw light upon the nature of the Ego and the conditions of existence of the conscious personality, than to exhibit the mechanism of memory under a new aspect. It forms an interesting portion of a work that has never yet been written in

full and whose title might be "Diseases and Aberrations of Personality." It will be difficult for us to avoid touching upon this subject every moment, but I shall endeavor to say of it only what is indispensable for clearness of exposition.

I shall be sparing of illustrative facts, for they are sufficiently known. The study of so-called cases of "double consciousness," is quite in the fashion. Dr. Azam's detailed and instructive study, in particular, has given the general reader a clearer idea of what is meant by periodic amnesia, than could be got from any definition. I shall, therefore, content myself with a review of the principal cases, proceeding from the most perfect phase of periodic amnesia to its most elementary forms.

I. The clearest, most unquestionable and most perfect case of periodic amnesia on record is that given by Macnish in his "Philosophy of Sleep," and which has since been oftentimes quoted: A young American woman, on awaking from a protracted sleep, lost memory of all she had before learned. "Her memory was capacious and well stored with a copious stock of ideas. Unexpectedly, and without any forewarning, she fell into a profound sleep, which continued several hours beyond the ordinary term. On waking, she was discovered to have lost every trace of acquired knowledge. Her memory was *tabula rasa*—all vestiges, both of words and things, were obliterated and gone. It was found necessary for her to learn everything again. She even acquired, by new efforts, the art of spelling, reading, writing and calculating, and gradually became acquainted with the persons and objects around, like a being for the first time brought into the world. In these exercises she made considerable proficiency. But, after a few months, another fit of somnolency invaded her. On rousing from it, she found herself restored to the state she was in before the first paroxysm; but was wholly ignorant of every event and occurrence that had befallen her afterward. The former condition of her existence she now calls the old state, and the latter the new state; and she is as unconscious of her double character as two distinct persons are of their respective natures. For example, in her old state she possesses all the original knowledge, in her new state only what she acquired since. In the old state she possesses fine powers of penmanship, while in the new she writes a poor, awkward hand, having not had time or means to become an expert."*

Dismissing for the moment all that relates to the alternation of the two personalities, we see that there have been formed here two perfect memories entirely independent of each other. It is not alone the memory of personal facts, the fully conscious memory,

* Macnish, "Philosophy of Sleep."

that is cut into two parts which never reunite, and which have no cognizance of each other: the same lot befalls the semi-organic, semi-conscious memory which serves us in speaking, in reading, and in writing. We are not informed whether this disscission of memory extended also to its purely organic forms, the habits,—whether the patient for instance had to learn anew how to use the hands for every-day offices, as in eating, putting on clothes, and the like. But even though we suppose this group to have remained intact, the separation into two distinct and independent groups is so complete as to satisfy the most exacting observer.

Dr. Azam recounts a case resembling this, but far less clearly defined. The normal memory disappears, and reappears periodically. In the interval no new memory is formed, but the patient retains a beggarly remnant of his old memory: such at least is the inference to be drawn from the record of an observation whose psychological details are not always very accurate.* The case was that of a youth who, having been subject to chorea, lost all memory of the past, forgot all that he had ever been taught, could no longer read, nor write, nor count, and recognized none of the persons around him except his father, his mother, and the nun who attended him. Yet while the amnesia lasted—and usually its term was a month—the young man could ride on horseback, drive a carriage, lead his accustomed life, and say his prayers very regularly at the proper times. Memory usually came back suddenly. So far as we may judge, there was in this case a periodic suspension of the memory in its instable and semi-stable—or conscious and semi-conscious—forms (consciousness being as a rule in ratio inverse to stability). But whatever had to do with organized memory remained intact: the lowermost strata of memory stood firm. I will not, however, dwell upon a case which has not been reported with sufficient details to warrant a psychological interpretation.

II.—A second and less complete, but more frequent form of periodic amnesia is that so interestingly described by Dr. Azam, in the case of Félicité X., and of which Dr. Dufay found the analogue in the case of one of his patients. These cases are so well known, and the original narratives so accessible, that a brief summary of them will suffice here.

A woman subject to hysteria was in 1856 attacked by a singular disease in consequence of which she thereafter led a two-fold life, passing alternately from one to another of two states, designated by Dr. Azam, as the "first" and the "second" state. In her normal ("first") state, she was grave, seri-

ous, reserved, industrious. Suddenly she would fall asleep, lose consciousness, and on returning to herself, she was found to be in the second state. Her character is now altered. She is gay, talkative, imaginative, coquettish. "She remembers perfectly all that occurred in other like states before, as well as what occurred in her normal state." Then after a longer or shorter period she again falls into a stupor. On coming out of this she resumes her first state. But now she has forgotten all that occurred in her second state, remembering only the occurrences of her prior normal states. I may add that as she grows older the periods of the normal state became shorter and shorter, and farther apart, and the transition from one state to the other now takes place instantaneously, whereas before it used to take ten minutes.

Such are the main features of this case. So far as it concerns our particular inquiry, it may be summed up in a few words. The patient passes alternately from one state to the other; in the one, she possesses all her memory; in the other, she has but a partial memory covering all states of the same kind.

The case observed by Dr. Dufay, at Blois, is very like this. During the period answering to Félicité's "second state," Dr. Dufay's patient "recollects the most trifling occurrence of her normal or of her somnambulistic state." There is also the same alternation of character, and in her period of perfect memory she speaks of her normal state as the "état bête"—the "brute state."

It is important to observe how, in this form of periodic amnesia, the portion of the memory is never affected but persists through both states. "In both states," says Dr. Azam, "the patient can read, write, count, and use the scissors or the needle as well as ever she could." There is not, as there was in the case cited by Macnish, a perfect scission between the two states: the semi-conscious states of memory are equally active in both.

III.—To complete our exposition of the different modes of periodic amnesia we will describe certain cases which present only some of its elements; they are seen in somnambulism, whether natural or induced. As a rule, somnambulists, on coming to themselves, have no recollection of what they said or did, but each crisis brings back the recollection of the preceding crisis. There are exceptions to this law, but they are rare. Macario's narrative has often been cited, of a girl who having been violated during a fit of somnambulism, had no cognizance of the fact on awakening, but who in her next somnambulistic state made it known to her mother. Dr. Mesnet witnessed a patient's attempt at suicide made with a good deal of judgment during two consecutive fits of somnambulism. A young maid servant every evening for three months thought she was a bishop, acting and speaking in that character; and Hamilton speaks of a poor apprentice who as soon

* "Revue Scientifique," 22 Dec., 1877. For instance, it is there said that during one of the attacks the patient "could converse intelligently and with animation, though he had not recovered his memory." (1)

as he fell asleep believed himself to be the father of a family, wealthy, a senator: every night he would recount his story in due order, in a loud voice, and if any one asked him about his apprenticeship, he would say that he was no apprentice. But it is useless to multiply examples; they exist in abundance, and they all show that side by side with the normal memory there is formed, during paroxysms, a partial, temporary, parasitic memory.

In summing up the general characters of periodic amnesia as exhibited in the phenomena, we find in the first place the *formation of two memories*.

In the perfect form of periodic amnesia (*e. g.*, Macnish's case) the two memories are mutually exclusive—the one appearing, the other disappears. Each suffices for itself; each has, so to speak, its own outfit. That organized memory whereby we are able to speak, write, read, is not common to the two states, but for each state there is formed a distinct memory of words, and of graphic signs, and of the mode of tracing them.

In the incomplete form (cases reported by Azam and Dufay, also in somnambulism) there is alternating with the normal memory a partial memory. The former includes all the states of consciousness; the latter only a restricted group of states which separate themselves from the others, and form in the life of the individual a series of fragments, linked together. But the two memories have a common ground in the less stable, less conscious forms of memory, which enter equally into both groups.

The result of this scission of the memory is that the individual seems to himself, or at least to others, as though he led a two-fold life—a natural illusion, for the Ego consists (or seems to consist) in the possibility of associating with present states—states that are recognized, *i. e.*, localized in the past, according to processes which we have striven to describe. Here we have two distinct centers of association or attraction, each attracting one group of facts, and in no wise affecting other groups.

It is evident that this formation of two memories, each totally or partially excluding the other cannot be a normal fact. It is the symptom of a morbid process—the psychic expression of a disorder, the nature of which remains to be determined. And this leads us, much to our regret, to treat in an incidental way a large question—that of the conditions of personality.

First, we must lay aside the idea of an Ego regarded as an entity distinct from states of consciousness. Such hypothesis is both useless and self-contradictory; it is an explanation worthy only of a psychology in its infant state, that takes that to be simple which so appears, and which invents instead of explaining. I accept the opinion of con-

temporary scholars who recognize in the conscious person a something composite, a resultant of highly complex acts.

The Ego, as it appears to itself, consists of a sum of states of consciousness. There is a principal state of consciousness around which secondary states are grouped and which these tend to supplant, they themselves being in turn pressed by other states that are hardly states of consciousness at all. The state which acts the principal part, after a longer or shorter contest, gives way, being displaced by another around which we have another similar grouping. The mechanism of consciousness may be compared, without any metaphor, with that of vision. In the latter there is a visual *point* which alone gives a clear and definite sense perception; round about this is a *field* of vision which grows less and less clear and definite in proportion as it recedes from the center and approaches the circumference. Our Ego is at each moment—that present that is ever being renewed—in great part re-constituted by memory; that is to say, to the present state are associated other states which, being thrown back into and localized in the past, constitute our personality as it appears at each moment. In a word, the Ego may be considered in two ways—either in its actually present state, and then it is the sum of our actually present states of consciousness; or in its continuity with the past, and then it is formed by memory according to a process we have already described.

From this it might appear as though the identity of the Ego rested entirely on memory; but that view takes note only of a part of the facts. Under the instable compound that is each moment forming, breaking up, and forming again, there stands something that persists, *viz.*, that dim consciousness which is the result of all the vital actions which constitutes our perception of our own bodies, and which has been designated by one word—*cœnæsthesis*. Our apprehension of it is so vague that it is difficult to speak of it in precise language. It is a state which, being perpetually repeated, makes no special impression on consciousness, and is like a habit. But though it is felt neither in itself nor in the gradual variations which constitute the normal state of the organism, it sometimes undergoes instantaneous or rapid variations which change the personality. All alienists teach that the incubation period of mental diseases is indicated not by intellectual disturbance, but by changes in *character*—and character is simply the psychic aspect of *cœnæsthesis*. So, too, we know that an organic lesion may transform the *cœnæsthesis*; substituting for the ordinary sense of existence a feeling of sadness, distress, anxiety, without cause, as the patient supposes; or again it may inspire feelings of gladness, satisfaction, buoyancy, perfect contentment—deceptive indications of grave

disorganization, the most striking illustration of which is seen in what has been called the euphoria of the dying. All these changes have a physiological cause; they represent its echo in the consciousness; and to say that while these variations are felt the normal state is not felt, is in effect to affirm that our normal life is not a mode of living because it is monotonous. This cœnæsthesis which, just because it is perpetually repeated, lies below the plane of consciousness is the true basis of personality. And it is so because, being always present, always active, without rest or respite, it knows neither sleep nor fainting, and endures as long as life itself, of which indeed it is but one form. This it is which serves as the ground of the conscious Ego constituted by memory; it is this which makes associations possible and when formed maintains them.

Hence the unity of the Ego is not a mathematical point, but that of a highly complex mechanism. It is a consensus of vital processes coordinated first by the nervous system, the great coordinating agency of the organism, and then by the consciousness, whose natural form is unity. It is in fact of the very nature of psychic states that they can coexist only in a very small number, grouped round one principal state which alone represents consciousness in its fullness.

Suppose, now, that we could instantly change our body and put another in its place—skeleton, vessels, viscera, muscles, all new except the nervous system, which remains the same, with all its past duly registered. There is no doubt but that in such case the afflux of unwonted life-sensations would produce the greatest confusion. Between the old cœnæsthesis, impressed on the nervous system, and the new cœnæsthesis acting with the intensity of everything new and unwonted, there would be irreconcilable opposition. This hypothesis is realized to a certain extent in morbid cases. Some obscure organic trouble occasionally so modifies the cœnæsthesis that the subject believes himself to be made of stone, or butter, or wax, or wood; that he is of the opposite sex, or that he is dead. But apart from morbid cases, consider what takes place at puberty: "When certain parts of the body that before were inactive assume the active state, a complete revolution takes place in the organism. A mass of new sensations, new desires, new imaginings, more or less distinct, new impulses come into the consciousness in a relatively brief space of time. Little by little they penetrate within the circle of the thoughts of longer standing, and form an integral part of the Ego. The latter becomes a different being: it is transformed, and the feeling of its self-hood undergoes a radical metamorphosis. Until assimilation is complete, this penetration and this dissociation of the primitive Ego can hardly be brought about without great commotion of the consciousness and tumultuous

disturbance.*" It may be affirmed that whenever changes in the cœnæsthesis, instead of being insensible or temporary, are rapid and permanent, discord arises between the two elements that constitute our personality in the normal state—the general sense of our body (cœnæsthesis) and conscious memory. If the new state holds its own, it becomes a center round which new associations group themselves; thus is formed a new complex, a new Ego. The antagonism between these two centers of attraction—the old, which is tending to dissolution, and the new, which is in process of development—produces different results according to circumstances. Sometimes the original Ego disappears, after enriching the new with its accumulated acquisitions, that is, with a portion of the associations of which it consisted. Again, the two Egos alternate, neither supplanting the other. Sometimes the original Ego exists no longer save in memory, but not being connected with any cœnæsthesis, it appears to the new as something extraneous.†

The object of the foregoing digression was to assign logical ground for what had before rested on mere assertion; namely, that periodic amnesia is only a secondary phenomenon; its cause is to be found in a vital disturbance, the general sense of existence (cœnæsthesis) which, properly speaking, is simply the sense of 'the unity of our body, passing through two alternate phases. This is the prime cause which produces the formation of two association-centers, and consequently of two memories.

Pursuing our investigation further, other questions meet us, to which unfortunately we can make no reply.

1. What is the physiological cause of these rapid and regular variations of cœnæsthesis? Only hypothetical replies have been offered (state of the vascular system, inhibitory action, etc.).

2. Why is each form of cœnæsthesis connected with certain forms of association, to the exclusion of others? We do not know, and can only say that in periodic amnesia the retention of impressions remains intact; that is to say, the cell modifications and dynamic associations remain; the power of recalling them is alone affected. The associations have two starting points: one state (A) may call out certain groups, but is incapable of awakening other groups; another

* Griesinger, "Traité des Maladies Mentales," p. 55. *et seq.*

† Thus I explain a case mentioned by Leuret ("Fragments psych. sur la folie," p. 277). An insane woman who spoke of herself as "*la personne de moi-même*" ("The person of myself"), had retained a very distinct memory of her life down to the beginning of her insanity, but she referred that period of her life to another person. Of her former Ego nothing but the recollection remained. Much might be said of such confusion of personality, but the discussion would take us beyond the subject we are treating.

state (B) does the reverse. Some groups enter equally into both complexes (incomplete scission).

In short, two physiological states, by their alternation, determine two cœnestheses, and these determine two forms of association, and consequently, two memories.

To complete our observations on this subject, it is well to refer briefly to the natural connection established, in spite of interruptions, sometimes of considerable duration, between periods of the same kind, and particularly between different fits of somnambulism. This fact, interesting as it is on several accounts, can be considered here only so far as it exhibits a periodical and regular return of the same recollections. Abnormal as it may at first appear, it is entirely logical and in full agreement with our conception of the Ego. For if the Ego at each instant is but the sum of the actual states of consciousness and of the vital processes in which consciousness has its root, it follows that every time that this physiological and psychological complex shall be constituted, the Ego will be the same and the same associations will be called up. In each attack a special physiological state is produced; the senses are closed to nearly all external excitations, and consequently many associations can no longer be awakened. There is a simplification of the mental life: it is reduced almost to a mechanical condition. These states, by their very simplicity very closely resemble one another, and differ totally from the waking state. It is, therefore, natural that the same conditions should produce the same effects, that the same elements should give rise to the same combinations, and that the same associations should be awakened to the exclusion of others. They find in the pathological state their conditions of existence, which in the normal state either are wanting, or are in antagonism with many other conditions.

In the state of health and in the waking state the phenomena of consciousness are so varied, so numerous, that the same combination has little chance of being awakened many times in succession, though in certain abnormal cases this is seen to occur, under the action of unknown causes. A clergyman, says Dr. Reynolds, apparently in good health, went through the pulpit service one Sunday morning with perfect consistency, his choice of hymns and lessons, and his extempore prayer being all related to the subject of the sermon. The Sunday following he went through the service in precisely the same manner, selecting the same hymns and lessons, making the same prayer, giving out the same text, and preaching the same sermon. On descending from the pulpit he had not the slightest remembrance of having gone through precisely the same service on the preceding Sunday. He was much alarmed,

and feared an attack of brain disease, but nothing of the kind supervened.*

A like return of memory sometimes occurs in drunkenness, as in the well-known case of the Irish porter, who, having lost a package while drunk, got drunk again, and remembered where he had left it.

As has been already said, cases of periodic amnesia, curious though they may be, teach us more as to the nature of the Ego than as to the nature of memory. Still they are instructive, and we will return to them in the next paragraph.

III.

Progressive amnesia is that form which by a slow and continuous process of dissolution leads to complete abolition of memory. This definition applies to the majority of cases, and it is only in exceptional instances that the morbid evolution fails to result in total extinction. The process of the disease is very simple and does not impress the imagination, precisely because it is gradual, but it is highly instructive because, in showing how the memory is disorganized, it teaches us how it is organized.

Here we are not called upon to cite special cases of rare occurrence or of exceptional character. It suffices to describe just one morbid type that is very nearly constant.

The primary cause of the disease is some progressive lesion of the brain—cerebral hemorrhage, apoplexy, softening of the brain, general paralysis, senile atrophy and the like. In the early stages there exist only partial disorders. The patient is subject to frequent moments of forgetfulness, always with respect to *recent* occurrences. If he drops the work he happens to be doing, he forgets to take it up again. The events of yesterday and the day before, the order he has received, the resolution he has taken—all are blotted out at once. This partial amnesia is the habitual symptom of incipient general paralysis. Lunatic asylums are full of patients belonging to this category who, the day after they are received, declare that they have been a year, five years, ten years in the institution. They have only a faint remembrance of having left their homes and families; they cannot tell the day of the week nor the month of the year. But their memory of what they did and what they learned before the onset of the disease is still intact. It is a familiar observation that in aged persons the characteristic failure of memory has reference to recent occurrences.

That is about as far as the data of the received psychology go. The conclusion would seem to be that the dissolution of memory does not follow any law. I will offer proof to the contrary.

To discover the law we must make a psychological study of the progress of demen-

* *Apud*. Carpenter, *op. cit.*, p. 444.

tia. When the premonitory stages, of which we have spoken, are past, there supervenes a general and gradual enfeeblement of all the faculties, till at last the individual is reduced to a purely vegetative life. Physicians distinguish several species of dementia, as senile, paralytic, epileptic, etc., according to the cause which produces it. These distinctions do not concern us. The break-up of the mind is always the same thing whatever the cause may be, and in it alone are we interested. The question therefore is, in this breaking up of the mind, does the loss of memory proceed in a fixed order?

The many alienists who have described dementia have not dwelt on this question, as it has no importance for them. Their testimony, therefore, will be all the more valuable if we can find an answer in their writings: and we do. On consulting the best authors (Griesinger, Baillarger, Falret, Foville, etc.) we learn that the amnesia, at first restricted to recent events, later extends to ideas, then to feelings and affections, and finally to acts. Here we have all the data of a law. To determine what the law is we have only to examine successively these several groups.

1. That the weakening of the memory first affects the recollection of recent events is an observation so familiar that we fail to notice how it contradicts our a priori ideas. One would suppose that the most recent occurrences, those nearest to the present would be the most stable, the most distinctly remembered, and such is in fact the case in the normal state. But at the setting in of dementia there occurs a serious anatomical lesion—the degeneration of the nerve cells begins. These elements, tending to atrophy, can no longer retain new impressions. In more precise language, no new modification of the cells, and no formation of new dynamic associations is possible, or at least durable. The anatomical conditions of stability and reviviscence are wanting. If the perception is entirely new, it is not registered in the nerve centers and is instantly blotted out. If it is only a repetition of prior experiences that are still vivid, the patient refers the perception to the past; the concomitant circumstances of the actual perception are quickly effaced, and cannot be localized in time. But the modifications fixed years before in the nerve elements and now become organic; the dynamic associations and groups of associations that have been repeated hundreds and thousands of times still persist; they have greater power of resistance to meet destructive forces. Thus is explained the paradox of memory, that the new dies before the old.

2. Soon this old-time store of organic and conscious memories, on which the patient for a time subsists, is in turn dissipated. His intellectual acquisitions are lost, one after

another (scientific, artistic, professional knowledge, languages, etc.). His personal recollections fade away, those of later years first, those of childhood last. When the process of decay is in an advanced stage, the stories and ditties of childhood even return. Often the demented forget in great part their own language. A few expressions are remembered by accident, but commonly the patient repeats automatically the words he retains. The anatomical cause of this intellectual dissolution is an atrophy which, little by little, invades the cortex of the brain, and then the white matter, producing a fatty and atheromatous degeneration of the cells, tubes and capillaries of the nerve-substance.

3. It has been noticed by the best observers that the affectional faculties are extinguished far more slowly than the intellectual. It may at first seem strange that states so vague as those of feeling and sentiment should be more stable than ideas and intellectual states in general. But reflection shows that the feelings are the deepest, the inmost, the most persistent features of our mental constitution. Whereas the intelligence is something acquired and as it were external to us, the feelings are inborn. Considered in their origin, aside from any refined and complex forms they may assume, they are the direct and permanent expression of our organism. The viscera, muscles, bones—every tissue of our bodies contributes its share toward their formation. What are we but our feelings and sentiments? to forget them is to forget ourselves. Hence amnesia of the feelings must naturally occur only at a period when disorganization has gone so far that the personality begins to break up.

4. The acquisitions that longest withstand dissolution are those which are almost entirely organic—the daily routine, habits to which we have long been addicted. Many patients can arise in the morning, dress themselves, take their meals regularly, go to bed, engage in manual labor, play cards and other games, sometimes with remarkable skill, though the judgment, the will, the affections are extinguished. This automatic activity, which presupposes only a minimum of conscious memory, belongs to that lower form of memory for which the cerebral ganglia, the medulla and the spinal cord suffice.

The progressive destruction of the memory therefore follows a logical course, a law. *It descends progressively from the instable to the stable.* It begins with the recent recollections which, being but faintly impressed on the nerve elements, seldom repeated, and consequently but feebly associated with other recollections, represent organization in its lowest stage. It ends with that sensorial, instinctive memory which, being rooted in the organism and become a part of it, or rather become the organism itself, represents organization in its most pronounced aspect. From the initial to the final term the progress

* The term is used here in its medical sense, not as a synonym of insanity in general.

of amnesia, determined by the nature of things, follows the line of least resistance, that is, of least organization. Thus pathology fully bears out what we have said with regard to memory. It is a process of organization in varying degrees between two extreme limits: the new state, organic registration.

This law, which I shall call the Law of Regression or of Reversion, seems to rest on facts and to be objectively true. Still, to remove all doubt and to obviate every objection, I propose to verify this law by a counter demonstration.

If memory, when failing, follows invariably the course indicated, then it must follow the reverse course when it is in process of restoration: the forms that disappear last must reappear first, for they are the most stable; and the process of restoration must be an ascending one.

It is very difficult to find cases in proof. In the first place the memory must return of its own accord: cases of re-education prove but little. Again, recovery from progressive amnesia is of rare occurrence. Finally, as attention has never been directed to this point, nothing is to be found upon it in the books. Physicians, whose attention is engrossed with the other symptoms are content to observe that memory "returns little by little."

Louyer-Villermay in his essay, quoted above observes that "memory when in process of re-establishment, follows an order inverse to that followed when in decay: events, adjectives, substantives, proper names." But little is to be drawn from this not over-precise remark.

Here is something more definite: "Late-ly a celebrated Russian astronomer forgot, successively, the events of the previous day, then those of the year, then those of the years last past, and so on, the chasm gradually increasing, till at last he could only recollect the events of his childhood. His case was considered hopeless; but by a sudden stop and unforeseen return, the blank was filled up in an inverted manner; the events of his youth first reappearing, then those of his manhood, and finally the more recent, those of the previous day. His memory was wholly restored at the time of his death."*

The following observation is still more to the point: the facts were noted in this instance hour by hour. I quote the greater part of the narrative: †

"I must in the first place mention two details of no great importance in themselves, but which need to be noted because they are connected with a remarkable phenomenon. Toward the end of November, an officer of

my regiment suffered an injury to the left foot from the chafing of the boot. On November 30 he went to Versailles to visit his brother. He dined in Versailles and in the evening went back to Paris, and on entering his lodging found on the mantelpiece a letter from his father.

"Now for the principal fact. On December 1 this officer was at the riding school, and his horse having fallen, he was thrown to the ground, falling on his right side, particularly on his right parietal bone. The concussion was followed by a slight syncope. Coming to himself he mounted his horse again 'to get rid of a trace of giddiness,' and continued his lesson in horsemanship for three-quarters of an hour. Still he would now and then remark to the groom, 'I am coming out of a dream. What is the matter with me?' He was taken to his lodging.

"As I lived in the same house, I was summoned immediately. He was standing as I entered, recognized me, saluted me as usual, and said, 'I am like one coming out of a dream: what is the matter with me?' His utterance was unimpeded. He answered all questions rationally. He complained only of a buzzing in his head.

"Though questioned by myself, his groom and his servant, he remembered neither the injury of two days before, his journey to Versailles on the day before, his leaving the house in the morning, his orders to his domestic on going out, his fall, nor anything that followed thereafter. He fully recognized his friends, called each by name, knew that he was an officer, knew the day of the week, and so on.

"I never allowed an hour to pass without noting his condition. At every call, he always thought I had come then for the first time. He remembered none of the prescriptions he had been following—footbaths, friction, etc.; in short for him nothing existed but the action of the present moment. Six hours after the accident his pulse commenced to grow quicker and he began to retain in mind the answer so many times made to his question—"You had a fall from your horse? Eight hours after the accident, his pulse still rising, he remembered having seen me there once. Two hours and a-half later, the pulse being normal, he forgot nothing that was said to him. He then distinctly recollected the injury to his foot; and was also beginning to remember his visit to Versailles, but this in so uncertain a way that were any one to declare positively the contrary, he would have been inclined to believe him. But memory coming back more and more, he became assured during the evening that he had been at Versailles. There the progress for that day stood still. When he went to sleep, he was still unable to remember what he had done at Versailles, how he had come back to Paris, or where he had found the letter from his father.

* Taine, "Intelligence," Part 1, Bk. ii, ch. ii.

† "Observation sur un cas de perte de Mémoire," by Kœmpfen in the "Mémoires de l'Académie de Médecine," 1835, vol. iv, p. 489.

"On December 2, after a night of untroubled sleep, as soon as he awoke, he recalled in succession what he had done at Versailles, and his finding the letter on the mantelpiece. But he still knew nothing of what he had done, or seen, or heard, on December 1, prior to the accident—that is to say, he knew nothing of his own knowledge, but only what he had heard from others.

"The loss of memory was in the inverse ratio of the time that had elapsed between the several occurrences and his fall, and the return of memory was distinctly in the order from the more remote to the more recent."

This observation, made without any intention of bolstering up any hypothesis by a man who seems much surprised by the facts he records, strongly confirms our law of regression. True, this was only a case of temporary, limited amnesia; but it is seen that even within these narrow limits the law is verified. I regret that though I have searched a good deal, and made inquiries in many quarters, I am unable to lay before the reader many other cases of this kind. But when attention has been called to the matter, I hope other cases will come to light.

Our law, therefore, resting as it does on facts, and verified by this counter proof, may be held to be true till the contrary is shown. Then there are other considerations that go to corroborate it.

This law, however universal it may be with regard to memory, is but a particular expression of a still more general law—a biological law. It is a fact well known in biology that the structures that are latest formed are the first to degenerate—a fact, says a physiologist, analogous to what takes place in great commercial crises. The old houses withstand the hurricane, the new ones, less firm, are brought down on all sides. Again, in the biological world, dissolution proceeds in an order inverse to that of evolution—it proceeds from the complex to the simple. Hughlings Jackson was the first to prove in detail that the higher, complex, voluntary functions of the nervous system disappear first, and that the lower, simple, general and automatic functions disappear latest. We have seen both of these facts verified in the dissolution of the memory: what is new dies out earlier than what is old, what is complex earlier than what is simple. The law we have formulated is therefore only the psychological expression of a law of life; and pathology in turn exhibits to us in memory a biological fact.

The study of periodic amnesia has thrown new light on our subject. In teaching us how memory is constituted and how destroyed, it shows what memory is. It has revealed to us a law by which we may guide ourselves through the multitudinous varieties of diseases of memory, and which will later enable us to view them as one whole.

Without attempting a premature summary we may recall what has just been said: First

of all, and in every case, there is loss of recent recollections; in periodic amnesia there is a suspension of all the forms of memory except the semi-organized and the organic; in total temporary amnesia there is complete abolition of memory, except the organic forms; in one case, that described by Macnish, there is complete abolition, including the organic forms. We shall see in the next chapter that partial disorders of memory are governed by the same law of regression, especially that most important group, amnesia of language.

The law of regression accepted, we have next to determine how it acts. On this point I shall be brief, as I have nothing to offer but hypotheses.

It were puerile to imagine that recollections are deposited on the brain in layers in the order of their priority in time, after the manner of geological strata; and that disease, descending from the surface down to the deep-lying layers, acts after the manner of the experimentalist who removes slice after slice from the brain of an animal. To explain the course of the morbid process we must have recourse to the hypothesis offered above with respect to the physical bases of memory. I will state it again in a few words:

It is in the highest degree probable that recollections have the same anatomical seat as the primary impressions and that they call into action the same nerve-elements (cells and fibers). These elements may occupy very diverse positions—from the cortex of the brain to the medulla. Retention and reproduction depend, 1. On a certain modification of the cells; 2. On the formation of more or less complex groups, which we denominate dynamic associations. Such are the physical bases of memory as we conceive them.

The primary acquisitions—those dating from infancy—are the simplest, namely, the formation of automatic secondary movements, and the education of our senses: they depend principally on the medulla and on the inferior centers of the brain; and as we know, the cortex is at this period of life imperfectly developed. Late apart from their simplicity, there is every reason why they should be the most stable. In the first place the nerve-elements, when they receive these primitive impressions, are "virgin." Nutrition is in infancy very active, but this incessant molecular renovation serves only to fix the impressions, the new molecules take exactly the places of the old, and hence the acquired disposition of the nerve-elements becomes in the end equivalent to an innate disposition. Further, the dynamic associations established between these elements attains a state of perfect fusion, from being repeated innumerable times. Hence it is inevitable that these first acquisitions should be better retained and more easily reproduced than any others, and that they should constitute the most enduring form of memory.

So long as the adult individual remains in the state of normal health, his new impressions and new associations, though far more complex than those of childhood, are nevertheless very likely to be stable. The causes we have just enumerated are ever operative, though with less force.

But if through the effects of old age or of disease the conditions are changed; if the vital actions, and in particular nutrition, are weakened; if the loss exceeds the gain; then the impressions become instable and the associations are easily broken up. Take an example. Suppose a man in that stage of progressive amnesia in which recent events are very soon forgotten. He listens to a narrative, he views a landscape, or sees a show. The psychic fact is in the last analysis reduced to a sum of auditive or visual impressions forming highly complex groups. In the new story or the new show there is usually only one thing that is new—the grouping, the association. The sounds, forms, colors that make them up have been many a time experienced, and many a time remembered before. But now, owing to the morbid condition of the brain, this new complex of impressions fails to fix itself in the brain; the elements that constitute it are part of other associations or groups of far more stable character, that were formed in the period of normal health and that have been oft repeated.

The strife is very unequal between the new complex that weakly tends to establish itself in the nerve centers, and the older complexes that are firmly established. Hence all the chances are that the old combinations will be called up later, instead of the newer one. These hints must suffice. For the rest, this hypothesis as to the cause of progressive amnesia is only of secondary importance. Accepted or rejected, it in no wise affects the value of our law.

IV.

There is but little to be said of *congenital* amnesia. I will refer to it, so that nothing may be omitted. It is seen in idiots, in imbeciles, and in a minor degree in crétins. Most of the patients are afflicted with a general debility of memory. It varies according to individuals, and in some may be such as to render impossible the acquisition and retention of the simple habits which constitute the daily routine of life.

But though a general debility of memory is the rule, frequent exceptions occur in practice. Among these classes of patients there are some individuals who possess a very remarkable power of memory, within a restricted field.

It is often observed in idiots and imbeciles that their several senses are affected in very different degrees. Thus, the hearing may be extremely acute and discriminating while the rest of the senses are dull. The arrest of

development is not uniform at all points. Hence it is not surprising that debilitation of the general memory should coincide, in the same man, with the evolution or even the hypertrophy of a special memory. Thus some idiots, refractory to all other impressions, have a strong liking for music, and can remember an air they have heard only once. Others—and these cases are more rare—have memory of form and color, and show a certain skill in drawing. More frequently we find memory of numbers, dates, proper names, and words in general. "An imbecile remembered the date of every burial that occurred in a parish for thirty-five years. He could repeat with unflinching exactitude the names and ages of the deceased, as also of those who had conducted the funerals. Beyond this mortuary record he had not one idea; he could not answer the simplest question, he was incapable even of serving himself with his food." Some idiots that are unable to make the simplest calculations, will repeat without a slip the multiplication table. Others will recite by heart whole pages that they have heard read from books, though they cannot name a single letter of the alphabet. Drobisch relates the following fact of which he was himself a witness: a boy of fourteen years, nearly idiotic, had great difficulty in learning to read; yet he remembered with wonderful facility the order in which the words and letters succeeded one another. Give him two or three minutes to go over a page printed in a language unknown to him, or treating of subjects of which he knew nothing, and he could from memory spell all the words there found, precisely as though the book lay open before him.* The existence of these partial memories is so common a fact that it has been turned to account in educating idiots and imbeciles.†

It is further to be remarked that some idiots subject to mania or other acute disorders regain a temporary memory. Thus, "an idiot, become a maniac, narrated a rather complex occurrence of which he had many years before been a witness, and which had seemed to make no impression upon him."‡

In congenital amnesia it is the exceptions that are instructive. Our law simply confirms the commonplace truth that the memory depends on the constitution of the brain, and in idiots and imbeciles the brain is abnormal. But the formation of these limited, partial memories helps us to understand certain dis-

* Drobisch, "Empirische Psychologie," p. 561. Dr. Herzen writes to me about a Russian, from Archangel, now twenty-seven years of age, who was stricken with imbecility at the close of a debauch. Of the brilliant faculties of his adolescence all that he retained was an extraordinary memory, so that he could instantaneously perform the most difficult operations in arithmetic or algebra, and repeat word for word long pieces of poetry after hearing them read only once.

† See Ireland's work "On Idiocy and Imbecility," London, 1877.

‡ Griesinger, op. cit., p. 431.

orders of which we have not yet treated. I am inclined to believe that the methodical study of what occurs in idiots would enable us to determine the anatomical and physiological conditions of memory. We will return to this point in the next chapter.

CHAPTER III.

PARTIAL AMNESIA.

Reduction of memory to memories—Anatomical and physiological reasons for partial memories—Amnesia of numbers, names, figures, forms, etc.—Amnesia of signs—Its nature; a loss of motor-memory—Examination of this point—Progressive amnesia of signs verifies completely the law of regression—Order of dissolution: proper names; common nouns; verbs and adjectives; interjections and language of the emotions; gestures—Relation between this dissolution and the evolution of the Indo-European languages—Counter-proof: return of signs in inverse order

I.

Before we proceed to the consideration of partial amnesia we must first remark upon the varieties of memory. Without such preliminary remarks the facts we are about to state would appear inexplicable. That a man should lose only his memory of words, or should forget one language, retaining others, or that a language long forgotten should come back to him suddenly, or that he should be bereft of his musical memory and of that alone—these things are so odd and strange on first view that were it not that they are vouched for by the most scrupulous observers, they might well be relegated among fables. But if, on the other hand, we have a clear idea of what is meant by the word memory, the marvelous disappears, and these facts, so far from surprisiug us, appear as the natural, logical consequence of a morbid influence.

The employment of the word memory as a general term is perfectly correct. It designates a property common to all sentient and thinking creatures—the possibility of retaining impressions and of reproducing them. But the history of psychology shows that there is a tendency to forget that this term, like all other terms, has a real signification only in particular cases: that memory resolves itself into memories, just as the life of an organism resolves itself into the life of the organs, tissues, anatomical elements that compose it. "The ancient and still unexploded error," says Lewes, "which treats memory as an independent function, a faculty, for which a separate organ, or seat, is sought, arises from the tendency continually to be noticed, of personifying an abstract-

tion. Instead of recognizing it as the short hand expression for what is common to all concrete facts of remembrance, or for the sum of such facts, many writers suppose it to have an existence apart."*

Though every-day experience has long noted the natural inequality of the different forms of memory in one and the same person, psychologists either have not interested themselves in that fact, or have denied it on principle. Dugald Stewart seriously maintains that "original disparities among men in this respect are by no means so immense as they seem to be at first view, and that much is to be ascribed to different habits of attention, and to a difference of selection among the various objects and events presented to their curiosity."† Gall, who was the first to make a stand against this tendency, ascribed to each faculty a memory of its own, and denied the existence of memory as an independent faculty.

Contemporary psychology, more careful than the old-school psychology to omit nothing, and more concerned about exceptions that afford instruction, has brought to light a considerable number of facts which remove all doubt as to the natural inequality of the several memories in the same individual. Taine gives many excellent examples of this. We may cite in illustration Horace Vernet and Gustave Doré, painters, who can paint a portrait from memory; chessplayers who can carry on one or more games in mind; little calculating prodigies like Zerah Colburn who "see their sums before their eyes"; ‡ the man mentioned by Lewes who, after walking half a mile down a street, could name all the shops in their respective positions; Mozart writing the notes of the Sistine chapel *Miserere* after hearing it twice. For details I refer the reader to special treatises,§ as I have no occasion to discuss the question here. It is enough that the reader hold these inequalities of the memory for well established. Let us now see how they are explained; we shall then see what they themselves explain.

What is implied by these partial memories? Special development of a special sense with the anatomical structures dependent on it.

To make this clearer, take a particular case—for instance a good visual memory. This has for its condition a good structure of the eye, of the optic nerve, and of the portions of the brain which concur in the act of vision—that is to say (according to the received notions of anatomists) certain portions of the pons, the crura, the optic tract, and the

* *Op. cit.*, Vol. III, p. 119.

† "Philosophy of the Human Mind."

‡ I have had occasion to note that many calculators do not see their figures nor their sums, but that they "hear" them. So far as our theory is concerned it matters little whether the images are visual or auditive.

§ Taine, "Intelligence," vol. 1, part 1, Book II, ch. 1, § 1; Luys, "The Brain and its Functions;" Lewes, loc. cit.

hemispheres. These structures, higher by hypothesis than the average, are perfectly adapted to receive and to transmit impressions. Consequently the modifications which the nerve-elements undergo, as also the dynamic associations formed between them—and these, as we have often said, are the bases of memory—ought to be more stable, more definite, more easily revived, than in an ordinary brain. In short, to say that a visual organ has a good anatomical and physical constitution, is to say that it presents the conditions of a good visual memory.

We may go further, and say that the term "a good visual memory" is too broad. Daily experience shows us that one person recollects forms best, another person colors.

It is probable that the former's memory depends mainly on the muscular sensibility of the eye, that of the latter on the retina and the nervous apparatus connected with it.

These remarks apply to hearing, smell, taste, and those diverse forms of sensibility comprised under the general name of touch—in short, all sense perceptions.

If we reflect upon the close relations subsisting between the feelings, the emotions, the general sensibility, and the physical constitution of each individual, and if we consider how dependent these physical states are upon the organs of animal life, we shall understand that these organs bear the same relation to the feelings that the organs of sense do to sense perceptions. Through differences of constitution, the impression transmitted may be faint or strong, stable or transient: here are so many conditions to modify the memory of feelings and sentiments. The preponderance of any system of organs—those of generation for example—gives the superiority to one group of recollections.

There remain the higher psychic states—abstract ideas and complex sentiments. These cannot be referred directly to any organ: the seat of their production and reproduction has never been localized with precision. But as they no doubt result from an association or a dissociation of primary states, there is no ground for supposing that they are exceptional.

The foregoing remarks may be summed up thus. In the same individual an unequal development of the several senses and of the several organs produces unequal modifications in the corresponding parts of the nervous system, and consequently varieties of memory. It is probable even that inequality of memories in the same person is the rule, not the exception. As we have no exact processes for weighing and measuring them separately, and comparing them with one another, we offer the foregoing only as a conjecture. An indirect proof might be drawn from the antagonism between the different forms of memory: this is a point that might give occasion for much curious research, but

it is beside our subject. * Finally, no objection can be brought from the influence of education. Of course education counts for much, but it hardly does anything more than to foster what nature has already singled out; and in certain cases it has been unable to act any part.

In psychology, as in all sciences based on facts, experience decides in the last resort. We would remark however that the relative independence of the different forms of memory might have been demonstrative by reasoning alone. In fact it is a corollary of the two propositions following, viz.: 1, Every recollection has its seat in certain determinate parts of the brain; 2, The brain and the cerebral hemispheres themselves "consist of a number of organs totally differentiated, each one of which possesses a function of its own, though it remains most closely connected with the others." This latter proposition is now accepted by most authors who study the nervous system.

In physiology indeed the distinction of partial memories is now currently received,† but in psychology the method of "faculties" has succeeded so well in having the memory regarded as a unit that the existence of partial memories has been completely forgotten or has been taken for an anomaly. It was needful that I should bring the reader back to the reality and remind him that in the last analysis there exist only special, or as some authors say, local memories. We willingly accept this latter term provided it be borne in mind that we have to do here with a distributed localization, according to the hypothesis of dynamic associations already set forth. The memory has often been compared to a store-house where all our items of knowledge are kept in separate shelves. If this simile is to be retained it must be presented in a more active form—each particular memory would be compared to a squad of employees charged with a special and exclusive branch of business. One of these squads may be dropped without throwing all the rest into confusion. This is what occurs in partial disorders of memory.

After these preliminary observations, we proceed to study the pathology of memory. If in the normal state the different forms of memory are relatively independent, it is perfectly natural that in the morbid state one form should disappear, leaving the rest intact. This fact must appear to us now as simple, and needing no explanation, resulting as it does from the very nature of memory.

* On the antagonism of memories, see Herbert Spencer, "Principles of Psychology," vol. 1.

† See in particular Ferrier, "Functions of the Brain." Even Gratiolet "Anatomie Comparée," Vol. II, p. 460, remarked that "to each sense corresponds a memory that is correlative to it, and that the mind like the body has its temperaments which result from the predominance of a given order of sensations in the natural habits of the mind."

True, many partial disorders are not restricted to only one group of recollections. This will not excite surprise if we reflect on the close solidarity of all the parts of the brain, their functions and the psychic states therewith connected. Still we shall find a certain number of cases in which the amnesia is limited.

A complete study of partial amnesia would involve the examination, one after another, of the different manifestations of psychic activity, and proving from examples that each group of recollections may disappear, whether for a time or forever. We can by no means carry out that plan. We are unable even to say whether certain forms are never partially affected, and never disappear, save when there is total dissolution of the memory. We must look to the future for fuller or more conclusive pathological proofs.

Properly speaking there is only one form of partial amnesia that may be studied thoroughly—the amnesia of signs (whether spoken or written signs, interjections, gestures.) It is rich in all sorts of facts explicable by the law formulated in the preceding chapter. Leaving that for separate study, we will state what is known with regard to other forms of partial amnesia.

"Some persons," writes Calmeil, * "have lost the power of reproducing certain sounds, or certain colors, and have had to abandon music or painting" others lose only the memory of numbers, figures, a foreign language, proper names, or the existence of their nearest relatives. We offer a few examples.

The case of Sir Henry Holland, narrated by himself in his "Mental Pathology" (p. 160), has often been quoted: "I descended on the same day two very deep mines in the Harz Mountains, remaining some hours underground in each. While in the second mine, and exhausted both by fatigue and inanition, I felt the utter impossibility of talking longer with the German inspector who accompanied me. Every German word and phrase deserted my recollection: and it was not until I had taken food and wine, and been some time at rest that I regained them again."

This case, though the one best known is far from being unique. Dr. Beattie tells of a friend of his, who having received a blow on the head, lost all he ever knew of Greek, his memory in other respects appearing to be intact. This loss of languages that have been acquired by study, has often been noted as a result of sundry fevers.

"So as regards music. A child having received a severe blow on the head, was unconscious for three days. On coming to himself he had forgotten all the music he had learned; nothing else was lost." † Other cases are more complex. A patient who had forgotten

the values of the musical notes, was able to play a tune after hearing it. Another could write musical notes, even compose music and recognize a melody he heard executed; but he was unable to play with the notes before him.* These facts showing as they do the complexity of our mental operations, even of those which seem most simple, will be considered later.

In some cases the best organized recollections, the most stable, disappear momentarily, while others presenting the same character remain intact. Thus Abercrombie tells of a surgeon who having been thrown from his horse and suffered an injury in the head, gave the minutest directions upon coming to himself as to his treatment. But he no longer remembered that he had a wife and children, and this forgetfulness lasted for three days. † Is this fact to be explained on the theory of mental automatism? This surgeon, though half insensible, remembers his professional knowledge.

Some patients lose entirely the memory of proper names, even their own. We shall see later, when we come to study the amnesia of signs, in its perfect evolution—as it is seen in the aged—that these proper names are always soonest forgotten. In the cases that follow, this forgetfulness was the symptom of softening of the brain.

A certain man, unable to recall the name of a friend, had to take his interlocutor to the door on which was a plate bearing the name. Another person, after an attack of apoplexy, was unable to recall the names of any of his friends, though he designated them correctly by their ages. Mr. von B., formerly Envoy to Madrid, and afterward to St. Petersburg, was about to make a visit, but could not tell the servants his name. "Turning round immediately to a gentleman who accompanied him, he said with much earnestness, 'For God's sake, tell me who I am!' The question excited laughter, but as Mr. von B. insisted on being answered, adding that he had entirely forgotten his own name, he was told it, whereupon he finished his visit." ‡

In other instances an apoplectic attack is followed only by amnesia of numbers. A traveler after long exposure to cold experienced a great weakening of the memory. He could not himself make any calculation, nor retain for a moment any operation in numbers.

Forgetfulness of faces is frequent, nor need this excite surprise, for in the normal state many persons have this kind of memory very ill developed and very instable; besides, the memory of faces must be the result of a pretty complex mental synthesis. Loyer Villermay gives an amusing example:

* Kussmaul, "Die Störungen der Sprache," p. 214. Proust, "Archives générales de médecine," 1872.

† Abercrombie, "Intellectual Powers."

‡ Forbes Winslow, *op. cit.*

* "Dictionnaire en trente volumes," art. *Amnesie*.

† Carpenter, "Mental Physiology," p. 443.

"An old man being in the company of his wife imagined her to be a lady whom he had in the past been wont to visit every evening, and he would repeat again and again, 'Madam I cannot remain longer; I must return to my wife and children.'"

Carpenter tells us of a distinguished scientist whom he had known from childhood, that though turned seventy years of age he was still full of vigor, but that his memory was failing. In particular, he forgot recent occurrences and words in most frequent use. "Though continually at the British Museum, the Royal Society, and the Geological Society, he would be unable to refer to either by name, but would speak of 'that public place.' He still continued his visits to his friends, and recognized them in their own homes, or in other places (as the Scientific Societies) where he had been accustomed to meet them; but the writer, on meeting him at the house of one of the oldest friends of both, usually residing in London, but then staying at Brighton, found that he was not recognized; and the same want of recognition showed itself when the meeting took place out of doors. The want of memory of words then showed itself more conspicuously, one word being substituted for another, sometimes in a manner that showed the chain of association to be (as it were) bent or distorted. Thus, he told a friend that 'he had had his umbrella washed,' the meaning of which was gradually discovered to be that he had had his hair cut. His memory steadily declined, and he died of apoplexy."*

In this instance there is seen simultaneously existing amnesia of proper names, and names of things, and amnesia of faces; but what is most curious is the part played by the law of contiguity. Recognition of persons is not spontaneous, suggested simply by their presence. To have recognition, it must be suggested or rather aided by the actual impression of the places where they habitually are. The recollection of these places, fixed by the experience of a life-time, and become almost organic, remains stable: it serves as a fixed point to call out other recollections.

The names of these "public places" is not revived: the association between the object and the sign is too faint. But the recollection of faces is in operation, being dependent on a stable sort of association, namely contiguity in place. The one category of association that has survived assists in reviving another category, which, left to its own resources, would not have been called up.

It were an easy thing, but profitless to the reader, to enumerate cases of partial amnesia. It is enough to have shown by a few examples wherein partial amnesia consists.

The question naturally arises whether the forms of memory which disease either dis-

organizes for good or only temporarily suspends, are the ones that are best established, or only the weakest. We cannot answer positively. Logically, it would seem that the morbid influences must follow the line of least resistance: and the facts appear to confirm this hypothesis. In most cases of partial amnesia it is the least stable forms of memory that are attacked. At least I do not know of a single case in which, any organic form being suspended or abolished, the higher forms have remained intact. Yet it were rash to assert that this has never occurred.

We may therefore only reply to the question with an hypothesis till we shall be in possession of fuller information. For the rest it would be contrary to scientific method to refer to one law all sorts of cases depending on special conditions. A thorough study of each case and its causes is necessary before we can declare them all to be reducible to one formula. Just now the problem is too obscure to permit of this being done.

The same remarks apply to the process by which these forms of amnesia are produced. In the first place we know nothing about the physiological mechanism special to each form. Here all means of explanation fail us. As regards the psychological mechanism we may venture an hypothesis. In the cases of partial amnesia we have been considering there are two things in particular worthy of note, viz., destruction and suspension. Destruction is the direct result of the disorganization of the nerve-elements. In the case of suspension a certain group of elements remains temporarily isolated and powerless, or, in psychological language, it stands outside of the mechanism of association. This explanation is suggested by the case cited by Carpenter. The solidarity existing between the different parts of the brain, and consequently between the different psychic states persists, as a rule. These groups alone, with the sum of recollections that they represent, are in a manner made immobile, inaccessible to the other groups, incapable for a time of entering into the consciousness. This state must be the result of physiological conditions which escape our notice.

II.

We have reserved for special study one form of partial amnesia—that of *signs*. Here we use the term *signs* in its broadest sense, comprising all the means man employs for expressing his feelings and thoughts. The subject is one that is clearly defined and rich in facts at once like and unlike, inasmuch as they possess a common psychological character in that they are signs, while they differ as to the nature of the signs, which are either vocal or written signs, gestures, drawings, or music. They are easily observed and of every-day occurrence, and well localized; and owing to their variety they are well suited for comparison and analysis. Besides, as we shall see, this species of par-

* *Op. cit.*, p. 545.

tial amnesia very strikingly confirms the law of the destruction of memory laid down in the preceding chapter in its most general form.

But first we must guard against a misunderstanding. The reader may suppose that we are about to study aphasia: but not so. In most cases, aphasia, it is true, implies a disorder of the memory, but it implies something more; and it is only with disorders of memory that we are concerned. The researches made during the last forty years upon the diseases of the faculty of language, have shown that under this one term, aphasia, are included cases that differ very widely from one another. The reason is that aphasia being, not a disease, but a symptom, varies according to the morbid conditions that produce it. Thus, some aphasic subjects are deprived of every mode of expression; others are able to speak but not to write, or *vice versa*; the loss of gesture is much less frequent. Sometimes the patient retains a pretty considerable vocabulary of vocal and graphic signs, but speaks and writes in counter-sense (paraphasia, paragrammia). Or he does not understand the signification of words whether written or spoken, though hearing and sight be intact, (word-deafness, word-blindness). Aphasia is either permanent or transitory: oftentimes, it is accompanied by hemiplegia. This hemiplegia—which nearly always attacks the right side—is in itself, quite apart from amnesia, an obstacle to writing.* These principal forms present varieties according to the individuals affected. From this, the reader may have some idea of the complexity of the question. Fortunately, we have not to discuss it here. Our task—and it is one of no little difficulty—consists in determining among these disorders of speech and of the expressive faculty in general, that which seems to belong to memory alone.

Plainly, we have nothing to do with cases where aphasia results from idiocy, dementia, or loss of memory in general; neither with cases where the power of transmission alone is impaired: thus a lesion of the *white* matter of the brain, in the neighborhood of the third left frontal convolution may impair the expressive faculty, the gray matter being intact.† But after these two causes are eliminated, the difficulty is hardly lessened, for aphasia usually occurs under quite other conditions. We will examine it under its most ordinary form.

There is no need to cite instances, which the reader may find everywhere. † Usually,

aphasia appears suddenly. The patient is unable to speak; if he tries to write, there is a like inability; at best he is able, with great difficulty, to trace a few unintelligible words. His physiognomy retains the look of intelligence. He strives to convey his meaning by gestures. For the rest, there is no paralysis of the muscles that serve to articulate words; the tongue moves freely. Such are the general traits, at least the ones which most interest us just now.

What has occurred in the psychic state of the patient, and, as regards the memory, what is it that he has lost? A little reflection suffices to show that amnesia of signs is a phenomenon of quite a special character. It is not to be compared to the forgetfulness of colors, sounds, a foreign language, or a period of life. It extends to all the activities of the mind, and so far forth it is general; and yet it is partial only, for the patient retains his ideas and his recollections, and is conscious of his own situation.

In our opinion, the amnesia of signs is above all a disease of the *motor memory*: that it is which gives it its special character and makes it assume for us a new aspect. But what is meant by "motor memory," an expression which may at first cause surprise? The matter has been so little studied by psychologists, that it is difficult to discourse of it clearly in a summary way, and it cannot be treated here at any length.

I have endeavored in another place,* though not with sufficient fullness, to show the psychological importance of movements, and to prove that every state of consciousness implies in some degree motor elements. But to confine ourselves to the matter in hand, I would remark that no one finds difficulty in admitting that our perceptions, our ideas, our intellectual acts in general are not fixed in us, and have no part in memory except there exist in the brain certain residua—modifications of nerve-elements and of the dynamic associations of those elements. On this condition alone are they retained and recalled. But the same must of necessity hold good for movements. The movements under consideration, those which take place in articulate speech, writing, drawing, music, gestures, can be retained and reproduced only on condition that there are motor residua, *i. e.*, according to the hypothesis so often set forth, modifications in the nerve-elements and dynamic associations between those elements. But whatever opinion one may adopt, if nought remained of a word spoken or written for the first time, it were impossible either to read or to write.

* In left-handed subjects of aphasia the hemiplegia is always on the left side.

† For cases of this kind, see Kussmaul, "Die Störungen d-r Sprache," p. 99.

‡ The literature of aphasia is so plentiful that a simple enumeration of works or memoirs would occupy several pages. For the psychological aspects, the reader may consult Trousseau, "Clinique Médi-

cale," vol. II: Fabret, art. "Aphasia" in "Dict. encycl. des sciences médic.," Proust, "Archives gén. de méd.," 1872; Kussmaul, *ubi supra*; H. Jackson, "On the Affections of Speech," in *Brain*, 1878, 1879 1880, etc.

* "Revue Philosophique," Oct., 1879; see also an excellent chapter of Maudsley's work, "Physiology of Mind."

The existence of motor residua admitted, we may understand the nature of sign-amnesia.

Our intellectual activity consists, as we know, in a series of states of consciousness associated according to certain relations. Each term of a series seems to the consciousness simple, but it is not so in reality. When we speak or think with anything like precision, all the terms of a series form couples, made up of the thought and its expression. In the normal state the fusion of these two elements is so complete that they form one, but disease shows that they can be dissociated. Further, the expression "couple" does not suffice. It is exact only for that portion of the human race that cannot write. When I think of a house, over and above the mental representation which is the state of consciousness proper, over and above the vocal sign which translates that thought and which seems to form one thing with it, there exists a graphic element that is almost as intimately blended with the thought, and which, when I write, becomes even predominant. Nor is that all: around the vocal sign, "house," are grouped, by a less intimate association, the vocal signs used in other languages with which I am acquainted—*maison, domus, Haus, casa*, etc. Around the graphic sign, "house," are grouped the graphic signs of those same languages. Thus we see that in an adult mind, each clear state of consciousness is not a simple unit, but a complex unit, a group. The mental representation, the thought, is, properly speaking, only the nucleus, around which are grouped signs more or less numerous which determine it.

This understood, the mechanism of sign-amnesia becomes clearer. It is a pathological state in which, the idea being intact or nearly so, a part of the signs or all the signs which translate it are temporarily or forever forgotten. This general proposition must be completed by a more detailed study.

1. Is it true that in aphasic subjects, thought subsists, while its verbal and graphic expression has disappeared?

I would remark that it is not incumbent on us to inquire here whether one can think without signs. The question we have to discuss is altogether different. The aphasic subject has for a long time been using signs: do his ideas disappear with the power of giving them utterance? The facts answer in the negative. Though authors are unanimous in declaring that aphasia, especially when it is of long standing and of a serious character, is always accompanied by a certain decline of mental power, there is no doubt that mental activity persists even when it has no other mode of expression but gestures. Instances abound, but I will cite only a few.

Some patients deprived only of a portion of their vocabulary, but unable to find the right word, substitute for it a paraphrase or a description. For "scissors" they will say

"what you cut with;" for window, "what you see through." They will designate a person by the place he lives in, by his titles, his occupation, his inventions, the books he has written.*

In more serious cases we see patients playing cards with considerable caution and reflection: others again are able to superintend the management of their business. Thus we have a great proprietor mentioned by Trousseau, "who by means of signs intelligible to those around him directed the leases and deeds to be laid before him, pointed out modifications to be made in them, and in most cases these modifications were useful and based on sound judgment." A man who was totally deprived of the power of speech, sent to his doctor a detailed account of his trouble written by himself in very correct language, and in a very firm hand.

We have furthermore the testimony of patients themselves after their recovery. "I had forgotten all words," says one, "but I retained fully my consciousness and my will. I knew very well what I wanted to say, but could not. When you," (the physician), "asked me a question, I understood you perfectly; I made all sorts of efforts to reply, but it was impossible to recall the words." † Rostan, on being stricken suddenly so that he was unable either to speak or to write a single word, "analyzed the symptoms of his disease and sought to refer them to some special lesion of the brain, just as he would have done in a clinical lecture." Lordat's case is well known: "He was capable of arranging in his mind the matter of a lecture, of altering the distribution of the several headings; but when his thoughts had to be uttered in speech or in writing, it was found to be impossible, though there was no paralysis." ‡

We may therefore regard it as proven that, all means of expression having disappeared, the intelligence remains almost intact, and consequently that the amnesia extends only to signs.

2. Does this amnesia depend, as we have said it does, especially upon the motor elements? When on a preceding page we endeavored to prove the necessary existence of motor residua, we did not examine the problem in all its complexity. We must return to it:

When we are learning to speak our mother tongue or a foreign language, certain sounds, acoustic signs, are registered in the brain. But that registration is only a part of the

* Very often the aphasic patient confounds words, and says "fire" when he means "bread," or even coins words that are unintelligible. But these disorders seem to me to be rather a language-disease than a disease of memory.

† Legroux, "De l'aphasie," p. 96.
‡ For the facts see especially Trousseau, *op. cit.* Lordat, who is a strong spiritualist, (*i. e.*, advocate of the doctrine of an immaterial principle or soul in man), has from these cases drawn conclusions favoring the independence of mind.

task, for we have to repeat these signs, to pass from the receptive to the active state, to translate these acoustic signs into vocal movements. This operation is at first very difficult, for it consists in co-ordinating movements that are very complex. We are able to speak only when these movements are readily reproduced, that is, when the motor residua have been organized.

In learning to write we fix our eyes on the copy; optic signs are thus registered in the brain; then, with much effort we strive to reproduce these by the motions of the hand. Here, too, there is co-ordination of very complex movements. We are able to write only when the optical signs are immediately translated into movements, that is, when the motor residua are organized.

The same is to be said of music, drawing, acquired gestures, (for instance, those taught to deaf mutes). The expressive faculty is more complex than it seems to be. Our thoughts and feelings have need of an acoustic (or optical) memory—a motor memory. Now, what is there to prove that it is precisely this motor memory that is affected in cases of amnesia of signs?

Consider the phenomena observable in most cases of aphasia. Present to the aphasic subject any familiar object, for instance a knife, and call it by some other name, as *fork, book, etc.*; he will contradict you. Pronounce the true name and he expresses assent by gesture. If you ask him then and there to repeat the name, it is but seldom that he will be able to do so. Therefore, he has retained not only the idea but also its acoustic sign; for this he recognizes among many other signs. But since he cannot translate it into speech, though his vocal organs are intact, it follows that the amnesia must affect the motor elements.

The same experiment may be made with regard to writing. Among aphasic subjects, who are not paralyzed, it leads to the same results. The patient retains the memory of the optical signs, but has lost the memory of the movements necessary for their reproduction. Some patients can copy, but when the original is taken from them they are helpless.

However, while I hold that motor amnesia exists in most cases, I do not claim that it is always present. In so complex a subject, it is best not to pronounce absolutely. When the aphasia is irremediable we sometimes find the patient forgetting the vocal or written signs, or recognizing them only with great difficulty and with much hesitation. In such cases amnesia is not restricted to the motor elements. Again, some aphasic patients can, as we have seen, repeat a word or copy it; others can read aloud, though they are unable to speak in conversation. This is an exceptional case (Falret, p. 618). On the other hand, many can read to themselves, though unable to read aloud. It has hap-

pened, though rarely, that an aphasic patient would utter spontaneously one portion of a phrase, and then be unable to continue. Brown Séquard cites even the case of a physician who spoke in his dreams, though aphasic in the waking state. These facts, infrequent though they be, show that motor amnesia is not always absolute. It is with this form of memory as with all other forms: under certain exceptional circumstances it revives.*

We may in passing note an analogy. The aphasic patient who succeeds in repeating a word, exactly resembles one who is unable to recall an occurrence save with the assistance of other persons: the psychological mechanism of the amnesia of signs is the same as for all other kinds of amnesia. It consists of a dissociation: a fact is forgotten when it cannot be awakened by an association, when it cannot enter into any series. In aphasia the thought no longer calls forth its appropriate sign, or at least its motor expression. Here however, the dissociation is more complete: there is dissociation not only between *terms* united by prior experience, but between *elements* so knit together that they form for consciousness a unity; to assert their relative independence of one another would seem to be mere hair-splitting were it not demonstrated by pathological facts.*

It is this perfect fusion of the thought, the sign (whether vocal or written) and the motor element which makes it so difficult to prove clearly and indisputably that sign-amnesia is mainly motor amnesia. As every state of consciousness tends to translate itself into motion; and as, according to Bain's happy phrase, to think is to restrain oneself from speech or action, it is impossible by analysis alone to draw clear lines of demarcation between these three elements. Still it appears to me that the memory of vocal and written signs which survives in the intelligent aphasic patient, represents fairly what has been called the inner speech, that minimum of ideation without which the mind would be on the way toward dementia; and consequently that the motor elements alone are suppressed in sign-amnesia.

On consulting what has been written by physicians who have studied the psychology of amnesia, and they are but few, I find that their doctrine differs in hardly any respect from that here set forth, save in terminology. "I have asked myself," says Trousseau, "whether [aphasia] is not simply a forgetting

* Authors have in late years carefully described under the name of "Word-blindness" (Wordblindheit) and "Word-deafness" (Worttaubheit) maladies that have long been confounded under the general designation of Aphasia. The patient is able to read and write; sight and hearing are well retained, and yet the words he reads or hears spoken have for him no meaning. For him they are simply optical or acoustic phenomena and are no longer signs. This is another and rarer form of dissociation. Kussmaul gives details. Op. cit. chap. r. 27.

of the instinctive and harmonic movements which we learned in early childhood, and which constitute articulate language; and whether, owing to this forgetting, the aphasic patient is not in the condition of a babe who is learning to babble his first few words, or of a deaf mute who, suddenly cured of his deafness, strives to imitate the speech of those whom he hears for the first time. The difference between the aphasic patient and the deaf mute then would be that the one has forgotten what he had learned and that the other has not yet learned at all." (Op. cit. p. 718.)

To the same effect Kussmaul: "If we consider memory as a general function of the nervous system, then, in order that the sounds be combined to make words, there must be both an acoustic and a motor memory. Thus the memory of words is a double memory, first a memory of words as far as they constitute a group of acoustic phenomena, and second a memory of words as motor images. (Bewegungsbilder)".

It has been justly remarked by Trousseau that aphasia is always reducible to loss of the memory either of vocal signs or of the means whereby we articulate words. W. Ogle also distinguishes two word-memories, one universally known, whereby we have consciousness of a word, and the other whereby we give expression to it." (Op. cit. p. 156.)

Is there any ground for affirming that the residua which correspond to an idea, those which correspond to its vocal or graphic sign and to the movements which translate both of these, have their seats side by side in the cortex? What anatomical inferences are to be drawn from the fact that one may lose memory of movements without losing memory of the inner signs of speech, these without that of writing, or of writing without that of speech? Are the motor residua located in Broca's convolution, as some authors appear to hold? We can only state these questions; it is not for us to answer them. The relation between the sign and the idea, simple as it appears to the psychologist who follows the subjective method, is highly complex for the positive psychologist, who is helpless until anatomy and physiology have made further progress.

We have now to consider sign-aphasia under another aspect. We have studied it in itself, we will now study it in its evolution. I have endeavored to show that it affects especially the motor elements, and that this gives it its distinctive character: whether this be accepted or not does not concern what follows.

Sometimes the aphasia is of brief duration. Anon, it becomes chronic, and in seeing the patient after an interval of some years we notice no appreciable change. But there are cases where fresh apoplectic attacks increase the intensity of the malady, and then its course is progressive: such cases are of higher interest from our point of view.

There is a gradual breaking up, and the memory of signs declines little by little in a certain fixed order. Briefly stated, the order is, first, words, that is, rational speech; second, exclamatory phrases, interjections, what Max Müller calls "emotional language;" third, (in very rare cases), gestures.

We will examine in detail these three stages of dissolution; we shall thus have considered amnesia of signs in its totality.

1. The first stage is by far the most important, as it comprises the higher forms of language, those which are distinctively human, which express deliberate thought. Some physicians, even prior to the contemporaneous researches in aphasia, have remarked that all other things being equal, the memory of proper names is lost earlier than that of common nouns, and that the loss of common nouns precedes the loss of adjectives. This observation has since been confirmed by sundry investigations. "Substantives," says Kussmaul, in his latest work, "and in particular proper and concrete names (*Sachnamen*) are more readily lost than verbs, adjectives, conjunctions, and other parts of speech."* This fact has been noted only incidentally by medical men, and very few of them have inquired into its causes. In fact it possesses for them no clinical interest, while it is highly important for the psychologist.

We see at the first glance that amnesia progresses from the particular to the general. It first affects proper names, which are purely individual, then the names of things, next all substantives which are but adjectives in a special signification: † lastly, adjectives and verbs expressive of qualities, modes of being, acts and the like. The scholar mentioned by Gratiolet, who, having forgotten all proper names, was wont to say, "My associate who made such or such an invention," designated persons by their qualities. It has also been observed that idiots often have no memory save for adjectives. The idea of quality is the most stable, because it is the one first acquired, and because it is the basis of our most complex conceptions.

Now, since the particular is that which has least extension, and the general that which has most, we may say that the rapidity with which the memory of signs disappears is in inverse ratio to their extension; and since, *ceteris paribus*, a term has all the better chance of being repeated and fixed in the memory in proportion as it designates a greater number of objects, and all the less chance of being repeated and fixed in the memory in proportion as it designates only a few objects, we see that this law of dissolution rests in the last resort upon experimental conditions.

* "Die Störungen der Sprache," p. 164.

† The transformation of adjectives into substantives, one of the constant processes in the formation of languages, is still to be seen. Thus, we speak of a "special" meaning, "special" correspondent, a "brilliant," etc.

As a complement of these remarks, I will quote a passage from Kussmaul: "When the memory is failing, the more concrete an idea is, the more quickly is the term that expresses it lost. The reason of this is that our mental images of persons and things are more loosely connected with their names than are abstract notions, such as their condition, their relations, their qualities. We easily figure to ourselves persons and things without their names, because here the sensorial image is more important than that other image which is the sign, in other words their name. On the other hand, we do not acquire abstract ideas save by the aid of words which alone give to them a suitable form. Hence it is that verbs, adjectives, pronouns, and particularly adverbs, prepositions and conjunctions are more intimately associated with thoughts than are substantives. It may well be conceived that in the network of the cortical cells, many more phenomena of excitation and combination occur in the case of an abstract idea than in that of a concrete one, and that consequently the organic connections that attach an abstract idea to its sign are far more numerous than in the case of a concrete idea" (op. cit. p. 164). Translated into psychological language, this last phrase amounts to what we have already said, namely, that the stability of the sign is as its organization, *i. e.*, as the number of experiences repeated and registered.

The science of language also furnishes us with very valuable data. At the risk of wearying the reader by a superabundance of proof, I must take note of these. As was to have been expected, the evolution of language has followed an order inverse to that of the loss of language in aphasia.

Before we cite in favor of our law the historical development of languages, it might seem natural that we should ascertain the process of language development in the individual. That, however, is impossible. When we are learning to speak, our language is given to us ready-made. Though the babe, as has been well observed by Mr. Taine, "learns a language already made, as the true musician learns counterpoint, or the true poet prosody; in other words, as an original genius," still in reality he creates nothing at all. We must therefore confine ourselves to the historical evolution of language.

It is certain that the Indo-European languages are descended from a certain number of roots, and that these roots were of two kinds, namely, verb or predicative roots, and nominal or demonstrative roots. The former, comprising verbs, adjectives and substantives are, says Whitney, signs indicating acts or qualities. The others, whence come the pronoun and the adverb (the preposition and conjunction are of secondary formation), are few in number, and denoted relative position. The original form of language signs therefore is the attribution of qualities. Then

the verb and the adjective became discriminated. "Nouns are derived from verbs through the participles, which are only adjectives whose derivation from verbs is not yet obliterated."* As for the transformation of common nouns into proper nouns, that admits of no question. Does not the natural evolution of language explain the stages of its dissolution in aphasia, in so far as we may compare a spontaneous creation with the decay of a language artificially acquired?

2. In setting forth in its most general form the law of the regression of memory, we have seen that the memory of feelings is effaced later than the memory of ideas. Logic leads us to infer that in the case we are considering—progressive sign-amnesia—the language of the emotions must disappear later than the language of the reason. Facts fully confirm this deduction.

The most careful observers—as Broca, Trousseau, Hughlings Jackson, Broadbent—have noted a great number of cases where aphasic patients entirely deprived of speech, incapable of articulating spontaneously a single word, are able to utter not only interjections, but also complete phrases, brief habitual sentences expressive of anger or vexation, or of pain for their privation. One of the most persistent forms of such emotional language is that of profanity.

We have said that generally that which is of recent formation dies out first, whatever is of old formation disappears last. The remark is confirmed by what we see here: the language of the emotions is formed before that of ideas; it disappears later. So, too, the complex disappears earlier than the simple: and rational language, compared with the language of the emotions, is exceedingly complex.

3. All the foregoing remarks are applicable to gestures. That form of language—and it is the most natural of all—is, like the interjection, only a reflex mode of expression. It appears in the babe long before articulate language. Among some savage tribes stricken with arrest of development, gestures play as important a part as words. This inborn form of language is seldom lost. "Cases of aphasia in which disorders of the mimic faculty occur are always," says Kussmaul, "of an exceedingly complex character. In such cases the patients sometimes are conscious that they err in the use of gestures, sometimes again they are not." (Op. cit. p. 160).

Hughlings Jackson, who has carefully studied this subject, notes that some aphasic subjects can neither laugh nor smile, nor cry except in case of extreme emotion. Further he has noted that some patients express affirmation or negation by purely chance gestures: one of them, who had still at his command a few interjections and a few gest-

* Baudry, "La Science du Langage," p. 16. For fuller details consult the works of Max Müller and Whitney.

ures, employed them in a contrary sense, in an unintelligible way.

Trousseau gives a very remarkable instance of pure motor amnesia affecting gestures: "I would raise both hands and move my fingers, as though playing the clarinet, and tell the patient to do the same. He forthwith would perform these movements with perfect precision. 'You see,' I would say, 'I am acting as though I played the clarinet,' to which he would signify assent. After a few minutes I would ask him to execute the movement again. He would deliberate, but in most instances it was impossible for him to perform this very simple piece of mimicry."

Thus, then, we have seen that sign-amnesia proceeds from proper nouns to common, thence to adjectives and verbs, and finally affects the language of the emotions, and gesture. This destructive process does not advance at random, but follows a fixed order, from the less organized to the better organized, from the complex to the simple, from the less to the more automatic. What was said above when we laid down the general law of the reversion of memory might be repeated here, and it is one evidence of its correctness that it is verified in sign-amnesia, the most important, the most systematic and the best-known form of partial amnesia.

We may now proceed to give a counter-proof. When the amnesia of signs is complete and memory is gradually coming back, does this process follow an order inverse to that of the disappearance of memory? Instances of recovery are rare. I find one case, however, mentioned by Dr. Grasset, where a man was seized with "entire disability to express his thoughts whether in words, or in writing, or by gestures. Some days later his power of making himself understood by gestures was seen to return little by little—then successively the power of expression by means of words, and finally by means of writing."* It is highly probable that other instances might be found were the attention of observers directed to this point.

CHAPTER IV.

EXALTATION OF MEMORY, OR HYPERMNESIA.

General excitation—Partial excitation—Return of lost memories—Return of forgotten languages—Reduction of this fact to the law of regression—Case of false memory—Examples and a suggested explanation.

Hitherto, our pathological study has been limited to cases of impairment of memory. But there are cases of a very different kind,

where that which seemed to have been destroyed revives and faint recollections recover their original intensity.

Is this exaltation of memory, called by physicians hypermnesia, a morbid state? It is at least an anomaly; and since it is always associated with some organic trouble or some singular and unusual condition, it unquestionably belongs to our subject. It is a less instructive object of study than amnesia, but it must not on that account be omitted. Besides, as we shall see, it teaches us something about the persistence of recollections.

Excitations of memory are either general or partial.

I.

General excitation of memory is not easy to determine, the degree of excitation being relative. We should have to compare memory with itself in the same individual. Since the power of this faculty differs widely between different persons, there is no common measure; the amnesia of one person may be the hypermnesia of another. It is in fact a change of *tone* occurring in the memory, such as may occur in any other form of psychic activity; whether thought, imagination, or sensibility. Again, when we say that the excitation is general, that is merely a probable induction. As memory is subject to the condition of consciousness, and as consciousness exists only in the form of a series, all that we can prove is simply that during a longer or shorter period a multitude of recollections arise on all sides.

General excitation of memory seems to depend entirely on physiological causes, and in particular upon the rapidity of the cerebral circulation. Hence, it is of frequent occurrence in high fevers. It also occurs in cases of mania, ecstasy, hypnotism, occasionally in hysteria, and in the incubation-period of some brain diseases.

Besides these strictly pathological cases, there are others of a more unusual character which probably depend on the same cause. Thus, there are narratives of drowning persons saved from imminent death, all of which agree on this point, viz., that "when asphyxia began, the drowning person seemed to review in an instant the whole of his past life with all its little details." One man affirmed that "every instant of his former life seemed to glance across his recollection in a retrograde succession, not in mere outline, but the picture being filled with every minute and collateral feature forming a kind of panoramic picture of his entire existence, each act of it accompanied by a sense of right and wrong."

Under analogous circumstances, "a man of remarkably clear head was crossing a railway in the country when an express train, at full speed, appeared closely approaching him. He had just time to throw himself down in the center of the road between the two lines

* "Revue des Sciences Médicales," 1873, vol. ii, p 684.

of rails, and as the train passed over him, the sentiment of impending danger to his very existence brought vividly to his recollection every incident of his former life in such an array as that which is suggested by the promised opening of 'the great book at the last great day.'**

Even when we make allowance for exaggeration, these facts reveal to us a superactivity of memory of which we can have no idea in the normal state.

I will quote one more instance due to opium intoxication, and I beg the reader to note how this confirms the explanation already given of the mechanism of recollection. Says Thos. De Quincey: "I sometimes seemed to have lived for seventy or one hundred years in one night. * * * The minutest details of childhood, or forgotten scenes of later years, were often revived. I could not be said to recollect them, for if I had been told of them when waking I should not have been able to acknowledge them as parts of my past experience. But placed as they were before me, in dreams like intuitions, and clothed in all their evanescent circumstances and accompanying feelings, I *recognized* them instantaneously."†

All these general excitations of memory are transitory, never outliving the causes that produce them. Is there a permanent form of hypermnesia? If the term may be used in rather wide sense, we might apply it to the curious development of memory that follows certain injuries. Upon this point we find in old authors stories that are now controverted; instance the cases of Pope Clement VI., Mabillon, and others. There is no reason to question these stories, for modern observers, Romberg among them, have noticed a remarkable permanent development of memory as the result of brain concussion, smallpox, etc. The mechanism of this change being inscrutable, we need not dwell upon it.

II.

Partial excitations of memory are, by their very nature, definitely limited. When the habitual tone of the memory is as a whole preserved, whatever goes beyond that is easily ascertained. Such hypermnesia is the necessary correlative of partial amnesia; it proves again and under a new form that memory is made up of *memories*.

We find nothing resembling a law in the production of partial hypermnesia. It manifests itself in isolated facts, that is to say as the result of a concurrence of conditions which elude observation. Why is one group of cells forming one particular dynamic association affected rather than another? No reason can be given, whether physiological or psychological. The only instances in which there is any appearance of law are those to

be mentioned further on, where several languages come back successively to the memory.

Partial excitation most usually results from morbid causes: these have been already indicated. But sometimes it occurs in the state of health. Here are some examples: "A lady in the last stages of a chronic disease was carried from London to a lodging in the country; there her infant daughter was taken to visit her, and after a short interview carried back to town. The lady died a few days after, and the daughter grew up without any recollection of her mother till she was of mature age. At this time she happened to be taken into the room in which her mother died, without knowing it to have been so; she started on entering it, and when a friend who was along with her asked the cause of her agitation, she replied, 'I have a distinct impression of having been in this room before, and that a lady who lay in that corner and seemed very ill, leaned over me, and wept.'"‡

A clergyman, of marked artistic temperament (this is worthy of note), went with a party of friends to visit a castle in Sussex, which he had no recollection of having ever seen before. "As he approached the gateway, he became conscious of a very vivid impression of having seen it before; and he 'seemed to himself to see' not only the gateway itself, but donkeys beneath the arch, and people on the top of it. His conviction that he *must* have visited the castle on some former occasion made him inquire from his mother if she could throw any light on the matter. She at once informed him that, being in that part of the country when he was about *eighteen months* old, she had gone over with a large party and taken him in the pannier of a donkey; that the elders of the party, having brought lunch with them, had eaten it on the roof of the gateway where they would have been seen from below, while he had been left on the ground with the attendants and donkeys."†

The mechanism of remembering in these two instances leaves no room for question: it is a revival of memories produced by nearness in space. They simply present in a more striking and less accustomed way that which we see every moment of our lives. Who is there that, in order to regain a recollection that he has for the moment lost, has not gone back to the place where the thought first presented itself, thus placing himself as nearly as possible in the same material situation, and so bringing back the recollection in an instant?

As for hypermnesia due to any morbid cause, I will cite only one instance, which will serve as a type: "A boy, at the age of four, received a fracture of the skull, for

* For these cases and others of like nature, see Winslow, *op. cit.*, p. 333, *et seq.*

† "English Opium-Eater."

* Abercrombie, "Essay on the Intellectual Powers," p. 120.

† Carpenter, *loc. cit.*, p. 437.

which he underwent the operation of trepan. He was at the time in a state of perfect stupor, and after his recovery retained no recollection either of the accident or of the operation. At the age of fifteen, during the delirium of a fever, he gave his mother a correct description of the operation, and the persons who were present at it, with their dress and other minute particulars. He had never been observed to allude to it before, and no means were known by which he could have acquired the circumstances which he mentioned.*

The recovery of languages that have been quite forgotten, may well engage our attention for a moment. The case recorded by Coleridge is so well known that I shall not speak of it. There are many other cases of the same kind to be found in the works of Abercrombie, Hamilton and Carpenter. The anæsthetic sleep produced by chloroform or ether may produce the same effects as febrile excitation. "An aged forester had lived in early life on the Polish frontier and there had spoken Polish almost exclusively. Later he lived only in German districts. His children said that for thirty or forty years he had neither heard nor spoken a word of Polish. During two hours of anæsthesia, he spoke, uttered prayers, and sung only in Polish. †

Still more curious than the recovery of one language is the retrogressive return of many languages. Unfortunately the authors who have written about this fact, report it simply as a matter of curious interest, without stating all the particulars needed for its interpretation.

The most clearly defined case is the one observed by Dr. Rush, of Philadelphia, and recorded in his "Medical Inquiries and Observations upon Diseases of the Mind." "Dr. Scandella, an ingenious Italian who visited this country a few years ago, was master of the Italian, French and English languages. In the beginning of the yellow fever, which terminated his life, he spoke French only; but on the day of his death he spoke only in the language of his native country."

The same author writes in rather confused terms of a woman subject to attacks of temporary insanity. First she spoke in broken Italian; at the crisis of her disorder, in French; when the fever was abating, in German; when she was beginning to convalesce, she returned to English, her mother tongue.

Quitting these cases of regression through many languages, and turning our attention to simpler cases, we find an abundance of indisputable testimony. A Frenchman living in England and speaking English fluently, received a blow on the head. During his illness, he was able to answer questions only in French.

But there is no case more instructive than

one recorded by Dr. Rush. I have it, he says in substance, from a German Lutheran minister residing in America, and who had in his congregation a considerable number of Germans and Swedes, that when at the point of death they nearly all utter their prayers in their mother tongue. In visiting old Swedes upon their death-beds he was "much struck in hearing some of them pray in the Swedish language, who, he was sure had not spoken it for fifty or sixty years before, and who had probably forgotten it."

Winslow too notes how Catholics converted to Protestantism, during the delirium which precedes death, pray almost exclusively in the Roman formulas.*

This return of forgotten languages and formulas, properly understood, is simply a special instance of the law of regression. In consequence of a morbid action that usually ends in death, the most recent memory-deposits are first destroyed, and the work of destruction proceeding by degrees to the earliest acquisitions which are also the most firmly grounded, gives to them a momentary activity and then effaces them forever. Hypermnesia therefore is simply the result of conditions entirely negative; regression results, not from a normal return to consciousness, but from the suppression of more vivid, more intense states. These revived memories are like a feeble voice that can make itself heard only when more powerful voices are stilled. These acquisitions and habits of childhood or of youth come into the foreground, not because there is anything urging them to the front, but because there is nothing any longer to overlie them. Reviviscences of this kind are, strictly speaking, only a reversion back to conditions of existence that seemed to have vanished forever, but which the work of demolition brings to light again. I refrain however from the reflections that these facts so naturally suggest, and leave them for the moralist. He will be able to point out for instance how certain religious reversions occurring in the last moments of life, and which make so much noise in the world of polemics, are but the necessary effect of irremediable dissolution.

Independently of this unexpected confirmation of our law of regression, the outcome of our study of hypermnesia is a knowledge of the surprising persistence of those latent conditions of recollection which have been called "residua." But for these disorders of memory, we should not have suspected their existence, for consciousness, of itself, can only affirm the conservation of the states which constitute our everyday life and of certain other states which the will holds in dependence upon itself, because habit has fixed them.

Are we to infer from the fact of these reviviscences that nothing is lost from the

* Abercrombie, *op. cit.*, p. 149.

† Duval, art. Hypnotisme, in "Nouv. au Dict. de Médecine," p. 144.

memory? That whatever is once registered therein is indestructible, and that even the most transient impression may at one time or another be revived. Many authors, Maury in particular, have contributed striking examples in support of this opinion. But should any one maintain that, even in the absence of morbid causes, some residua disappear, there is nothing known whereby he might be peremptorily refuted. Possibly some cellular modifications and some dynamic associations are too instable to last. Still it may be said that persistence, if not the rule without exceptions, is nevertheless the rule; it embraces the great majority of cases.

Of the mode in which these old-time recollections are preserved and reproduced, we know nothing, but I may point out how this might take place on the hypothesis set forth in the present work.

If we accept as the material substratum of our recollections cell modifications and dynamic associations, any memory, however burdened it may be with impressions, may keep them all. For though cell modifications are limited in number, dynamic associations are innumerable. We may suppose that the old associations reappear when the new ones, disorganized for a time or permanently, leave the field clear for them. The number of possible reviviscences being much reduced, the chances are proportionately increased for the return of the more stable, *i. e.*, the oldest associations. But I will not dwell on an hypothesis that cannot be verified. I desire to confine my observations to that which can be ascertained.

We cannot refer to any of the preceding morbid types one illusion of a singular character, one besides that is of rare occurrence or seldom observed. Three cases of this illusion only are on record, and no specific name has been offered to designate it. Wigan has called it, inaptly enough, double-consciousness, and Sander defines it to be an illusion of memory (*Erringerungstauschung*). Other authors have given it the name of false memory, and this seems to me to be preferable. It consists in a belief that a state of consciousness that in reality is new was experienced before, so that when it first occurs it is thought to be a repetition.

Wigan in his well-known work, "Duality of the Mind," states that while he was attending the obsequies of the Princess Charlotte in Windsor Chapel, of a sudden the feeling came upon him that before he had witnessed the same spectacle. The illusion was transitory, but we shall see cases in which it is more lasting. Lewes justly classifies this phenomenon with others of more frequent occurrence. While journeying in regions never before visited by us, a turn of the road or a bend in the river brings us in sight of some landscape that we have seen before; meeting a person for the first time, we feel that we must have seen him elsewhere; on

reading in a book a passage that certainly we never read before, we feel that the thoughts have once been in our minds.

This illusion is easily explained. The new impression evokes from the past similar impressions, which, though indistinct, confused, evanescent, still suffice to give to the new state of consciousness the appearance of being a repetition. There is a ground of resemblance quickly perceived between the two states of consciousness which leads us to identify them. It is an error, but only a partial one, for there is in reality in our past something that resembles a prior experience of this present impression. While this explanation may do for very simple cases, there are others to which it will not apply.

A patient, says Sander, on hearing of the death of one he had known, was seized with an indefinable terror, because it seemed to him that he had already had the impression. "It was as though, some time ago, while he was lying on this very bed, X came and told me that Müller was dead. I replied, 'Müller died some time since; he cannot die twice.'"

Dr. Arnold Pick relates the most perfect instance of false memory I know of, the disorder assuming an almost chronic form. An educated man who reasoned clearly about his malady, and who wrote a description of it, was, at about the age of thirty-two, seized with a peculiar mental disorder. If he attended a festival, or visited any place, or fell in with any one, the occurrence, with all its circumstances, seemed to him so familiar, that he firmly believed that he had already had the self-same impressions, in the company of the same persons, under the same skies, the same weather, etc. If he did a piece of work, it seemed to him that he had done the very same work before under the same circumstances. This feeling occurred to him the same day, at the end of a few minutes, or a few hours, sometimes on the next day, but always with perfect distinctness.*

In false memory there is an anomalous condition of the mental mechanism that eludes observation, and which it is difficult to understand in the healthy state. The patient, even though he were a good observer, could only analyze it by ceasing to be under the illusion. Still I think these instances show that the impression received is reproduced in the form of a sensorial image—in physiological terms, there is a repetition of the primary cerebral process. This is nothing extraordinary, it is what occurs in every recollection that is not called forth by the actual presence of its object. The difficulty is to say why this image, appearing a minute, an hour, a day, subsequent to the real state of consciousness, gives to the latter the appearance of being a repetition. We may suppose the mechanism of recollection, of localization in

* "Archiv für Psychiatrie," 1876.

time to be working retrogressively. I venture to offer the following explanation :

The image thus formed, as has been said, is highly intense—of the nature of an *hallucination*. Consequently the real impression is thrown into the background, bearing the less distinct character of a recollection. It is localized in the past, erroneously if you consider the facts objectively, rightly if you consider them subjectively. This hallucinational state, though very vivid, does not, in fact, efface the real impression ; but as it is produced by it and becomes detached from it, it appears like a subsequent experience. It takes the place of the real impression, appears the more recent of the two, and in fact is the more recent. For us who look at the thing from without and in the light of what has taken place outside of the mind of the subject, it is not true that the impression has been received twice ; but from the point of view of the subject himself, who judges according to what consciousness tells him, it is true that the impression has been received twice, and within those limits his asseveration is incontestable.

In support of this explanation I may add that false memory is nearly always associated with mental disorder. The patient spoken of by Pick was subject to one form of insanity—he supposed himself to be the victim of persecution. Hence the formation of hallucinational images is quite natural. Still I do not pretend that my explanation is the only possible one. The case being so very uncommon, further and more careful observation is requisite

CHAPTER V.

CONCLUSION.

Relations between the retention of perceptions and nutrition, between the reproduction of recollections and the general and local circulation—Influence of the quantity and quality of the blood—Examples—The law of regression connected with a physiological principle and a psychological principle—Recapitulation.

I.

So far we have been describing the diseases of memory and seeking the law which governs them. Before we conclude we must say a word as to the causes, of course we mean immediate, organic causes. But even reduced to these terms the etiology of disorders of memory is very obscure, and very little is clearly ascertained with regard to it.

Memory consists in retaining and reproducing: retention seems to depend above all on nutrition; reproduction on the general or the local circulation.

I. Retention, which plays the more im-

portant part since without it reproduction is impossible, presupposes a primary condition which can only be vaguely defined as a normal constitution of the brain. As we have seen, idiots suffer from congenital amnesia, from innate inability to fix impressions in the memory. This primary condition is a postulate, not simply a condition of memory, but the necessary condition of the existence of memory.

This normal condition of the brain being granted, it is not enough that impressions be received, they must be fixed, organically registered, incrustated, so to speak: they must become a permanent modification of the brain; the modifications impressed upon the nerve-cells and nerve-filaments, and the dynamic associations between these elements must be made stable. This result can be produced only by nutrition. The brain, and particularly the gray matter, receives an enormous volume of blood. In no other part of the body is the nutritive function so active or so rapid. We know not the inner mechanism of this function. The minutest histological research is unable to trace the arrangements and rearrangements of the molecules. We know only the effects—all beside is but induction. But all sorts of facts go to show the close connection between nutrition and memory.

It is matter of every-day observation that children learn with wonderful facility, and that anything, as languages, which calls only for memory, is readily learned by them. We know, furthermore, that habits—that is to say one form of memory—are far more easily formed in childhood, in youth, than in maturity. At that period of life, so great is the activity of the nutritive process that new connections are rapidly formed. In the aged, on the contrary, a rapid effacement of new impressions coincides with a considerable decline of this activity.

That which is too quickly learned does not endure. When we say that a thing is "assimilated," we use no metaphor. I shall not dwell upon a truth that every one is ever repeating, little suspecting that this psychic fact has an organic cause. To fix recollections requires time, because nutrition does not accomplish its work instantaneously: the molecular movement constituting nutrition must proceed in one constant direction, and this end is served by the periodic renewal of the same impression.*

* "A distinguished theatrical performer," says Abercrombie, "in consequence of the sudden illness of another actor, had occasion to prepare himself, on very short notice, for a part which was entirely new to him; and the part was long and rather difficult. He acquired it in a very short time, and went through it with perfect accuracy, but immediately after the performance forgot every word of it. Characters which he had acquired in a more deliberate manner he never forgets, but can perform them at any time without a moment's preparation; but in regard to the character now mentioned, there was the further and very singular fact that, though he has repeatedly

Fatigue in every shape is fatal to memory. The impressions received under such conditions are not fixed, and the reproduction of them is very laborious and often impossible. Now, fatigue is regarded as a state wherein, owing to the over activity of an organ, the nutrition suffers and halts. When the normal conditions are restored, memory comes back again. The case already quoted from Sir Henry Holland is decisive upon this point.

We have seen that in cases of temporary amnesia, caused by concussion of the brain, the amnesia is always retroactive, extending back to a period of greater or less duration, anterior to the accident. This rule is almost without exception. Most physiologists who have studied this phenomenon, refer it to defective nutrition; the organic registration, which consists in a nutritive modification of the cerebral matter, has not had time to take place.

Finally it is to be noted that the gravest form of disease of memory, namely the progressive amnesia of the demented, of the aged, and of general paralytics, is produced by a steadily increasing atrophy of the nerve-elements. The tubes and the cells undergo a process of degeneration, and the latter eventually disappear, leaving behind an undifferentiated mass of matter.

These physiological and psychological facts all show that there exists between nutrition and retention the relation of cause and effect. There is exact coincidence between their periods of rise and fall. Variations short or long in the one are repeated in the other. If the one be active, or moderate, or languishing, so is the other. Hence the retention of recollections must not be regarded metaphysically, and as a "state of the soul" subsisting no one knows where, but as an acquired state of the cerebral organ implying the possibility of states of consciousness whenever their conditions of existence are present.

The extreme rapidity of nutritive changes in the brain, though at first it might appear to cause instability, in fact explains the fixation of recollections. "The waste following activity is restored by nutrition, and a trace or residuum remains embodied in the constitution of the nervous center, becoming more complete and distinct with each succeeding repetition of the impression; an acquired nature is grafted on the original nature of the cell by virtue of its plastic power." *

performed it since that time, he has been obliged each time to prepare it anew, and has never acquired in regard to it that facility which is familiar to him in other instances. When questioned respecting the mental process which he employed the first time he performed this part, he says that he lost sight entirely of the audience, and seemed to have nothing before him but the pages of the book from which he had learned it; and that if anything had occurred to interrupt the illusion, he should have stopped instantly." (*Op. cit.*, p. 203.)

* Maudsley, "Physiol. and Pathol. of the Mind".

We here touch the ultimate cause of memory biologically considered; it is an impregnation. It is therefore not surprising that an eminent English surgeon, in treating of the indelible impression made by infectious diseases on living tissues, should have indicated the following passage, which seems made to our hand: "It is asked," says Sir James Paget, "how can the brain be the organ of memory when you suppose its substance to be ever changing? or how is it that your assumed nutritive change of all the particles of the brain is not as destructive of all memory and knowledge of sensuous things as the sudden destruction by some great injury is? The answer is, because of the exactness of assimilation accomplished in the formative process; the effect once produced by an impression on the brain, whether in perception or in intellectual act, is fixed and there retained; because the part, be it what it may, which has been thereby changed, is exactly represented in the part which, in the course of nutrition, succeeds to it." * Paradoxical as the connection between an infectious disease and memory may seem, it is nevertheless rigorously exact, from the biological point of view.

II. In a general way the reproduction of recollections seems to depend on the state of the circulation. This point is much more obscure than the preceding, and the data concerning it are very incomplete. One difficulty arises out of the rapidity with which the phenomena succeed one another, and their continual changes. Another difficulty is due to their complexity. For reproduction does not depend on the general circulation alone, but also on the special circulation of the brain, and probably there are in the latter, too, local variations that may exert a strong influence. Nor is that all. We have, further, to take into account the quality no less than the quantity of the blood.

It is impossible to determine, even roughly, the part played by each of these factors in the mechanism of reproduction. We must be content with showing that circulation and reproduction present correlative variations. The main facts going to confirm this view are as follows:

Fever in its several degrees is accompanied by cerebral over-activity, and in this memory largely shares. We have already seen to what a degree of excitation it may attain. We know that in fever the rapidity of the circulation is excessive, that the constitution of the blood is changed, that it is loaded with elements resulting from too accelerated a process of combustion. Here we see a variation in quality and in quantity, which finds expression in hypermnesia.

Even when no fever exists, "impressions of trivial things, in which no particular interest was taken, often survive in memory when

* "Lecture on Surgical Pathology."

impressions of much more important or imposing things fade away; and in considering the circumstances, it will frequently be found that such impressions were received when the energies were high—when exercise, or pleasure, or both, had greatly raised the action of the heart. That at times, when strong emotion has excited the circulation to an exceptional degree, the clustered sensations yielded by surrounding objects are revivable with great clearness, often throughout life, is a fact noticed by writers of fiction as a trait of human nature.”*

Note again how easy and how rapid reproduction is in that period of life when the blood flows swift and strong, but how slow and labored, when age slows the circulation. Also how in the aged the constitution of the blood is changed, being less rich in globules and in albumen.

In persons debilitated by protracted disease, memory grows weak with the circulation. “Highly nervous subjects, in whom the action of the heart is greatly lowered, habitually complain of loss of memory and inability to think—symptoms which diminish as fast as the natural rate of circulation is regained.” †

There is exaltation of memory whenever the circulation has been modified by stimulants, as hasheesh, opium, etc., which excite the nervous system first, and then depress it. Other therapeutic agents produce the opposite effect; for instance, bromide of potassium, the action of which is sedative, hypnotic, retards the circulation, when taken in strong doses. A certain preacher had to give up the use of the bromide, having lost nearly all power of memory. It returned when he ceased to take the medicine.

The general conclusion to be drawn from all these facts is that the normal exercise of memory presupposes an active state of the circulation and a constitution of the blood rich in the materials necessary for integration and disintegration. When this activity becomes excessive there is a tendency to morbid excitation; when it decreases, there is a tendency to amnesia. More definite conclusions would have to rest on pure hypothesis. Why is it that one category of recollections rather than another is revived or effaced? We know not. There is in every case of amnesia and of hypermnesia so much that cannot be foreseen that it were vain to attempt an explanation. Probably it is fitting organic modifications, causes infinitesimally small, that make one series of impressions more easy or more difficult of recall than others. Some physiologists are of the opinion that limited and temporary eclipses of memory are due to local, transitory modifications of the caliber of arteries, under the action of the vaso-motor nerves; and have

cited as proof of this the fact that the return of memory is sudden, that it is caused by emotion and that the emotions have a special influence upon the vaso-motor system.

In cases of complete loss of memory, of which we have cited many, return depends on the circulation and nutrition. If it is sudden, and it but rarely is, the more probable hypothesis is that of an arrest of function, a state of inhibition which is suddenly terminated: this problem is one of the most intricate in nerve physiology.

If the return is the result of reeducation—and this is more usual—nutrition appears to play the principal part. The rapidity with which the patient learns again shows that all was not lost. The cells may have been atrophied, but if their nuclei (generally regarded as the sources from which they are reproduced) give rise to other cells, then the bases of memory are by that very fact re-established: the new cells resemble the parent cells in virtue of the tendency of all organisms to maintain their type, and of all acquired modifications to become transmitted modifications; in this case, memory is only a form of heredity.

II.

To sum up, memory is a general function of the nervous system. Its basis is the property possessed by the nerve-elements of retaining a received modification and of forming associations. These associations, the result of experience, we have called dynamic, to distinguish them from those which are natural or anatomical. Retention is assured by nutrition, which is ever making the modifications and associations stable, because it is ever renewing the modified nerve-substance. The power of reproduction seems to depend above all on the circulation.

Retention and reproduction: thus does all that is essential to memory depend on the fundamental conditions of life. The rest—consciousness, exact localization in the past is only a perfectionment. Psychic memory is only the highest and most complex form of memory. To restrict oneself to that, as most psychologists do, is to condemn oneself in advance to wrestle with mere abstractions.

These preliminaries settled, we have classified and described the diseases of memory; and as a precise observation is always of far more value than a general description, being more instructive and more suggestive, we have offered clear and authentic instances of each morbid type.

Having traversed a multitude of facts, we have pointed out their principal results, viz., first the necessity of resolving memory into *memories*, the mutual independence of which is clearly proved by pathological cases. Then we have shown that the destruction of memory proceeds according to a *law*. Setting aside secondary disorders, those of brief

* Herbert Spencer, “Principles of Psychology,” I, p. 235.
† *ib.*, p. 237.

duration and which are less instructive, and studying those whose evolution is normal, we have shown that:

In *general* dissolution of memory, the loss of recollections, follows an invariable order, namely: first, recent events; next, ideas in general; then, feelings; lastly, acts.

In *partial* dissolution of the most usual type, namely, sign-amnesia, the loss of recollection again proceeds according to an invariable order, viz., proper names, common nouns, adjectives and verbs, interjections, gestures.

The order is the same in both, namely, there is a regression from the more recent to the older, from the complex to the simple, from the voluntary to the automatic, from the less to the more organized.

The exactitude of this *law of regression* is proved by the very rare instances in which progressive dissolution of memory is followed

by recovery; the recollections in that case come back in the inverse order of their disappearance.

By the aid of this law of regression we have been enabled to explain the extraordinary reviviscence of certain recollections as a reversion of the mind back to states that seemed to have been effaced forever.

We have connected our law with the physiological principle that degenerescence first affects that which is of most recent formation; and with the psychological principle, that the complex disappears before the simple, because it is less often repeated in experience.

Finally, our pathological study has led us to the conclusion that memory consists of an organization process having varying degrees of perfection between these two extreme limits—the new state, the organic registration.

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THE DISEASES OF THE WILL.

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CHAPTER I.

INTRODUCTION.—THE QUESTION STATED.

DURING the last few years several authors have treated in detail certain departments of psychology according to the principle of evolution, and it has appeared to me that these questions might be discussed with advantage in the same spirit though in a different form, by studying the process of *dissolution*. I propose therefore in the present work to attempt such a study of the Will as I before made of the Memory; to investigate its anomalies, and from this research to draw some conclusions touching the normal state. In many respects the problem that confronts us here is more difficult than the former one: the term *will* denotes something more vague than the term *memory*. Whether we regard memory as a function, a property or a faculty, it is at all events a stable mode of being, a psychic situation that all may understand. The will on the other hand is resolvable into volitions, each one of which is a thing apart, an instable form of activity, a resultant varying according to the causes that produce it.

Besides this first difficulty there is another one that might seem greater

still, but this we shall have no hesitation in dismissing summarily. Is it possible to study the pathology of the will without touching upon the irresolvable problem of free will? I hold it to be possible, and even indispensable, to abstain from such discussion; nor is it timidity that imposes this abstention upon us, but simply method. Psychology, like all other experimental sciences, must strictly eschew all research into first causes, and to that class of studies does the problem of free will belong. One of the great services rendered to philosophy by Kant and his disciples consisted in proving that the problem of the freedom of the will resolves itself into the question whether we are able to place ourselves outside the series of effects and causes so as to make an absolute beginning. This power "which summons, suspends, or dismisses," as it has been defined by a contemporary writer who has studied it profoundly,* can be affirmed only on the condition that we enter the domain of metaphysics.

The task before us here is different. Experience both inward and outward is the one object of our research: its limits are our limits. We take volitions as facts, with their immediate causes, that is to

* Renouvier, "Essai de Critique Générale," 2d edition, I., 395-406.

say the motives which produce them, without inquiring whether these causes suppose causes *in infinitum*, or whether there is not some measure of spontaneity added to them. Hence the question presents itself in a form equally acceptable to the determinists and to their opponents, being consistent with either hypothesis. We expect furthermore to pursue our researches in such a manner that the absence of any sort of solution of the free will problem will not even be noticed.

I shall endeavor to show that in every voluntary act there are two distinct elements, namely the state of consciousness—the “I will”—which indicates a mental situation but which of itself possesses no efficiency; and a highly complex psychophysiological mechanism in which alone the power of acting or of inhibiting has its seat. As this general conclusion can only be reached as the result of particular conclusions furnished by pathology, I will for the time being abstain in this introduction from any systematic view of the subject, and will simply consider the will in its twofold mechanism of impulsion and inhibition, and in its source—the individual character—regardless of details that do not concern our subject.*

The fundamental principle governing the psychology of the will in its impulsive form both in the healthy and the morbid state, is that every state of consciousness always tends to express itself, to interpret itself by a movement, by an act. This principle is only a particular phase, special to psychology, of the fundamental law that reflex action is the sole type of all nerve action, of all life of relation. Properly speaking activity in an animal is not a beginning but an end, not a cause but a result, not a first appearance but a sequel. This point is of the highest importance, and it must not be lost sight of. It alone can explain the physiology and the pathology of the will, for this tendency of the state of consciousness to expend itself in a psychological or a physiological act whether conscious or unconscious, is the one simple fact to which are reducible all the combinations and all the complexities of the highest will activity.

The new-born babe, as Virchow defines it, “is but a spinal creature.” Its activity is purely reflex, manifested by such a mul-

tiplicity of movements that for a good while its education must consist in suppressing or in checking the greater part of them. This prodigality of reflex actions, which has its ground in anatomical relations, exhibits in all its simplicity the transformation of excitations into movements. These movements, whether they are conscious or whether they awaken only an inchoate consciousness, in neither case represent voluntary action: properly they do but express the activity of the species—that which has been acquired, organized, and fixed by heredity: but these are the material out of which the will shall be fashioned.

Desire marks a higher step in the progress from the reflex state to the voluntary. By desire we understand the more elementary forms of the affective life—the only ones that can exist prior to the birth of the intelligence. Physiologically these do not differ from reflex actions of a complex nature: psychologically they differ from the latter by the state of consciousness, often very intense, which accompanies them. Like as in reflex action, they tend directly and irresistibly to express themselves in acts. In the natural state, and so long as it is free from admixture, desire tends to satisfy itself immediately: such is its law imprinted in the organism. Children and savages are good instances. In the civilized adult desire is no longer in the natural state, being altered or curbed by education, habit or reflection. Often however it resumes its right; and history shows that in the case of despots, who in their own esteem and in that of others stand above all law, desire rules uncontrolled.

Pathology will show us that this form of activity grows as will power declines, and persists when the latter has disappeared. Nevertheless it marks a progress from the first period, inasmuch as it denotes a beginning of individuality. On the common ground of the activity which belongs to the species, desire limns in faint outline the individual character: it reflects the mode of reaction peculiar to an individual organism.

When a sufficient store of experiences exists to allow of the birth of the intelligence, there appears a new form of activity,—*ideomotor* activity it has been called, ideas, thoughts, being here the cause of movements. The term *ideomotor* has the further advantage that it points out the relationship between these movements and those of reflex action, of which the former are but a development.

* The reader will find in a recent work by Schneider, “Der Menschliche Wille vom Standpunkte der neueren Entwicklungstheorien” (Berlin, 1882), a good monograph on the will in its normal state, and from the point of view of evolution.

How can a thought produce a movement? This question is one that seriously embarrassed the old psychology, but it presents no difficulty when we look at the facts as they really are. It is now a truth currently accepted in cerebral physiology, that the anatomical basis of all our mental states comprises both motor and sensorial elements. I shall not dwell upon a question that has been treated fully in another place* and which would involve a digression. I would simply repeat that our sense perceptions, especially the important ones of sight and touch, involve as integral elements movements of the eye or of the members. And if movement is an essential element when we see an object actually, it must play the same part when we see an object ideally. Mental images and ideas, even abstract ideas, involve an anatomical substratum in which movements are represented in one way or another.

True, on studying the question more closely, it might be said that we must distinguish two kinds of motor elements, viz.: those which serve to constitute a state of consciousness, and those which serve to expend it—the former being intrinsic, the latter extrinsic. The idea of a ball, for instance, is the resultant of impressions made by surfaces, and of special muscular adjustments; but the latter are the result of muscular sensibility, and as such they are sensations of movement rather than movements proper—they are elements going to make up our idea of the object, rather than a mode of giving it expression.

Nevertheless this close relation established by physiology between ideas and movement enables us in some measure to see how the one produces the other. In reality, an idea does not produce a movement. Were an idea, as defined by the spiritualists,† to produce a play of the muscles, it were little short of a miracle. It is not the state of consciousness, as such, but the corresponding physiological state, which is transformed into an act. In short the relation is not between a psychic event and a movement, but between two states of the same kind—between two physiological states, two groups of nervous elements, the one sensitive, the other motor. So long as we persist in regarding consciousness as a cause, all is obscure; but when we look upon it as simply the accompaniment of a nervous proc-

ess, which alone is the essential element, all becomes clear, and factitious difficulties vanish.

This granted, we can roughly classify ideas in three groups, according as their tendency to transform themselves into acts is strong, moderate or weak and in a certain sense null.

1. The first group comprises intellectual states of high intensity: fixed ideas may be regarded as the type of these. They pass into act almost with the rapidity of reflex actions. These are ideas that "come home to us." The old psychology, affirming a fact of every day experience, used to say in its own language that the intelligence does not act upon the will save through the intermediation of the sensibility. This means that the nervous state corresponding to an idea is more readily translated into a movement, in proportion as it is accompanied by those other nervous states, whatever they may be, which correspond to feeling or sentiment. Nervous action is more energetic in proportion to the number of elements upon which it acts.

Most of the passions when they rise above the level of mere appetite, are to be referred to this group as principles of action. The whole difference is one of degree only, according as the affective elements predominate, or *vice versa*, in the complex thus formed.*

2. The second group is the most important for us. It represents rational activity—the will in the common acceptation of the word. Here the thought is followed by the act after longer or shorter deliberation. If we reflect we shall find that most of our actions are reducible to this type, allowance being made for the forms already mentioned, and for habits. Whether I rise to take the air at my window, or whether I enlist in the army with the purpose of becoming some day a general, the difference is only one of more and less; a highly complex volition like that last instance resolving itself into a series of simple volitions successively adapted to times and places. In this

* The relative independence of thought and feeling as causes of movement is clearly demonstrated by certain pathological cases. It may happen that the idea of a movement is of itself incapable of producing that movement: but let emotion be added and it is produced. A man that is paralyzed cannot by any effort of will move, say, his arm, yet it will be strongly agitated under the influence of an emotion caused by the arrival of a friend. In the case of softening of the spinal cord inducing paralysis an emotion, or a question addressed to the patient may give rise to more violent movements in the inferior members, upon which the will has no action.

* "Revue Philosophique," Oct., 1879.

† As opposed to "Materialists." It need hardly be said that the author has not in mind "Spiritists," or "Spirit Rappers."—TRANSLATOR.

group the tendency to act is neither instantaneous nor violent. The concomitant affective state is moderate. Many of the actions which constitute the ordinary course of our lives were at first accompanied by a feeling of pleasure, or curiosity and the like: now that feeling is weakened, still the connection between the idea and the act is fixed: when the idea comes up in the mind, the act follows.

3. With abstract ideas the tendency to movement is at a minimum. These ideas being representations of representations, pure schematisms, generalized concepts, the motor element is minimized in the same degree as the representative element. If we were to look upon all the forms of activity we have been considering as successive complications of simple reflex action, we might say that abstract ideas are a collateral ramification weakly attached to the main trunk, and which has developed in its own way. Their motor tendency is restricted to that inner speech, feeble as it is, which accompanies them, and to the awakening of some other state of consciousness. For just as in physiology the centrifugal period of a reflex action does not always end in a movement, but quite as often in the secretion of a gland or in some trophic action; so in psychology a state of consciousness does not always end in a movement, but in the summoning up of other states of consciousness, according to the well known mechanism of association.

The contrast so often noted between contemplative minds, who live among abstractions, and practical men is only the outward palpable expression of the psychological differences just mentioned. A few commonplace observations may be cited here, as the difference between knowing what is right and practicing it, between recognizing the absurdity of a creed and renouncing it, between condemning an unlawful passion and withstanding the same. All this is explained by the fact that the motor tendency of ideas, left to themselves, is exceedingly weak. We know not what are the anatomical and physiological conditions requisite for the production of an abstract idea, but we may without rashness affirm that once it becomes a motive to action other elements are added to it: this is the case with those who are "devoted to an idea." Men are governed by feeling and sentiment.

In the light of the foregoing remarks voluntary activity appears to us as a stage in

that progressive evolution which proceeds from simple reflex action, where the tendency to movement is irresistible, to the abstract idea, where the tendency to action is at the minimum. We are unable to determine precisely its beginning or its end, the transition from one form to another being almost imperceptible. Of set purpose and for the sake of clearness we have not examined the problem in its complexity: we have even eliminated one of the essential characteristic elements of will. Regarded as we have regarded it so far, will might be defined as a conscious act, more or less deliberate, having in view an end whether simple or complex, proximate or remote. It is thus that contemporary authors, as Maudsley and Lewes, understand it, when they define it to be *impulse by ideas*, or the *motor reaction of feelings and ideas*. Thus understood, volition would be simply permissive. But it is something very different. It is also a power of *arrestation*, or, to use the language of physiology, a power of *inhibition*.

For a psychology grounded only on inner observation this distinction between permitting and hindering is of little importance; but for a psychology that seeks to find in the physiological mechanism some explication of the operations of mind, and which regards reflex action as the type of all activity, it is of vital significance.

The currently received doctrine teaches that the will is a *fiat* which the muscles obey no one knows how. On this hypothesis it matters little whether the *fiat* commands a movement or an inhibition. But if with all contemporary physiologists we hold that reflex action is the type and the basis of all action whatever, and if consequently there is no occasion to ask why a state of consciousness is transformed into a movement—for that is the law—we have still to explain why it is not transformed. Unfortunately physiology is full of obscurity and indecision touching this point.

The simplest instance of the phenomenon of inhibition is seen in the suspension of the movements of the heart by excitation of the pneumogastric nerve. We know that the heart (independently of the intracardiac ganglia) is innervated by nerve filaments coming from the great sympathetic which accelerate its pulsations, and by filaments from the vagus nerve. Section of the latter increases the movements; excitation of its central terminus on the contrary suspends them for

a longer or shorter time. The vagus therefore is an inhibiting nerve, and inhibition is generally regarded as the result of interference. The reflex activity of the cardiac centers is retarded or suspended by excitations coming from the medulla. In other words, the motor action of the pneumogastric expends itself in the cardiac centers and produces an arrest of movement. This has no direct psychological significance, but here is something that concerns us more nearly:

It is a well known fact that the reflex excitability of the spinal cord becomes greater when it is withdrawn from the action of the brain. The state of decapitated animals gives striking evidence of this. But not to recur to those extreme cases, we know that reflex action is much more intense during sleep than in the waking state. To account for this some authors have held that there are in the brain centers of inhibition. Setschenow locates them in the optic thalami and in the region of the tubercula quadrigemina, his ground being the fact that when we stimulate by chemical or other means the parts named, we produce a depression of the reflex actions. Goltz locates the centers of inhibition in the brain proper.

These and other similar hypotheses * have been sharply criticized, and many physiologists hold simply that in the normal state excitations are distributed both to the brain taking an upward route and to the spinal cord by a transverse route; and that on the other hand in cases where the brain cannot play a part, the excitations now finding only one route open, the result is a sort of accumulation, the effect of which is an excessive reflex excitability. Ferrier † holds that in the frontal lobes are to be found controlling centers which are the essential factor of attention.

Not to go into further detail, it is seen that for explaining the mechanism of inhibition we have no clear and generally accepted theory such as we have with regard to reflex action. Some authors hold that inhibition results from two contrary tendencies clashing or destroying each other; others maintain the existence of inhibition centers (and even inhibiting nerves) capable of suppressing instead of re-enforcing a transmitted impulse; and

* For a full history of this question the reader may consult Eckhard, "Physiologie des Rückenmarks" in Hermann's "Physiologie," vol. ii., part 2, p. 33 *seq.* He will there find an account of the experiments of Setschenow, Goltz, Schiff, Herzen, Cyon, and others, with their interpretations.

† "The Functions of the Brain," §§ 103, 104.

there are sundry other hypotheses, but it would be of no advantage to enumerate them.* In this state of ignorance, we must examine the question as best we may.

In all voluntary inhibition two things have to be considered: the mechanism that produces it—of this we have just spoken; and the state of consciousness that accompanies it: of this we have to speak now. In the first place there are cases where the inhibition needs no explanation—where the will incitation ceases of its own accord: for instance, when one throws aside a decidedly tedious book.

Other cases appear to be explained by one or other of the hypotheses mentioned. We voluntarily arrest laughter, yawning, coughing and certain passionate movements, by putting in action, apparently, the antagonistic muscles.

In cases where as yet we know not how inhibition is produced, where the physiological mechanism is unknown, pure psychology may teach us something. Take the most commonplace instance—a fit of anger stayed by the will. Lest we exaggerate the power of the will, we would remark that such inhibition is far from being the rule. Some individuals appear to be utterly incapable of it. Others exercise it, but very unequally, their power of inhibition varying according to times and circumstances. Few men are at all times masters of themselves.

The first condition of the exercise of this power is time. If the incitation to anger be so violent as to pass immediately into action, that is the end of it. Whatever may be the excess of passion there is no help for it. But if the condition of time be filled; if the state of consciousness calls up antagonistic states, and if these are sufficiently stable, then there is inhibition. The new state of consciousness tends to suppress the other one, and by weakening the cause puts a check on the effects.

It is of supreme importance for the pathology of the will to investigate the physiological phenomenon that takes place in such cases. There is no doubt that the quantity of the nervous influx—whatever our opinion may be as to its nature—varies between individuals, and from one moment to another in the same person. Neither is there any doubt that, at a given moment, in any individual, the available quantity may be variably distributed. It

* See Wundt's "Mechanik der Nerven;" Lewes's "Physical Basis of Mind."

is clear that in the case of the mathematician making a computation and in that of a man gratifying a physical passion the quantity of nervous influx is not expended in the same way, and that one form of expenditure prevents the other, as the available capital cannot be employed at once for two purposes.

"We see," says a physiologist, "that the excitability of certain nerve centers is reduced by calling other nerve centers into action, if the excitations that reach the latter possess a certain intensity. If we consider the normal functioning of the nervous system, we find that there exists a necessary equilibrium between the different apparatus of this system. This equilibrium may be destroyed by the abnormal predominance of certain centers, which seem to divert to their own advantage too large a proportion of the nervous activity; as a consequence, the functioning of the other centers appears to be disturbed. . . . There are certain general laws that govern the distribution of the nervous activity at the different points in the system, as there are mechanical laws which govern the circulation of the blood in the vascular system: if any great perturbation occurs in an important vascular department the effect is necessarily felt at all other points in the system. These laws of hydrodynamics we can appreciate because the fluid in circulation is accessible to us, and because we know the properties of the vessels that contain it, the effects of elasticity, of muscular contraction, etc. But who knows the laws of the distribution of nervous activity, of the circulation of what has been called the nerve fluid? We recognize the effects of breaks in the equilibrium of nerve activity, but these are disturbances essentially variable, nor can they be reduced under any theory. We can only note their production, taking account of the conditions that accompany them."*

Applying these general considerations to our particular case, what do we find? The original state of consciousness (anger) has called forth antagonistic states which necessarily vary in different individuals—the idea of duty, the fear of God, the opinion of men, the law, disastrous consequences, etc. The result is the production of a second center of action, or in physiological language, a diversion of the nervous afflux, a weakening of the first state to the advantage of the second. Is this diversion sufficient to restore the equilibrium? The event alone can decide.

Still when the inhibition takes place, it is always only relative, and its only result is that the action is weaker. What remains of the original impulse expends

itself as best it can through half-restrained gestures, in perturbation of the viscera, through some artificial outlet, as for instance in the case of the soldier who when he was being shot to death, chewed a bullet so that he might not make any exclamation. Very few persons are so endowed by nature or so formed by habit as to be able to reduce their reflex actions to imperceptible movements.

This diversion of the nervous influx therefore is not a primordial fact, but a state of secondary formation, set up by means of an association at the expense of the state which it displaces.

We would observe that in addition to these two antagonistic centers of action there are other causes which tend to weaken directly the primitive impulse.

But we must examine the difficulty more closely, for though the coexistence of their two antagonistic states* suffices to produce indecision, incertitude, non-action, it is not sufficient to produce voluntary inhibition in the true sense of the phrase, "I will not." One condition more is needed, and this is found in an affective element of the highest importance, of which we have not yet spoken. The feelings and emotions are not all stimulants to action: many of them have a *depressive* effect. Of these terror may be regarded as the extreme type. In its highest degree, terror paralyzes. A man suddenly visited with a great affliction is incapable of any reaction, whether voluntary or reflex. The cerebral anæmia, the arrest of the heart's action—often producing death by syncope—the profuse perspiration with chilling of the skin, the relaxation of the sphincter muscles: all these prove the excitability of the muscular, vaso-motor, secretory and other centers to be for the time being suspended. The case is an extreme one, but it gives us a view of the subject as through a magnifying glass. Between terror and indifference we have all possible degrees of fear with the corresponding degrees of depression.

If from this maximum we descend to moderate fear, the depressive effect grows less, but without changing its character. How do we arrest the movements of anger in a child? By threats, by reprimands, that is to say by producing a new state of consciousness of a depressing kind, capable of checking action. "An infant of three and a half months," says B. Perez.

* Franck, "Dictionnaire Encyclopédique des Sciences Médicales," art. NERVEUX.

* Of course we do not separate them from their physiological conditions, which are the principal element.

"knows from one's looks, from the tone of one's voice, when he is reprimanded. He frowns, his lips quiver convulsively, he pouts for an instant, his eyes fill with tears, and he is ready to cry." The new state therefore tends to supplant the old not only by its own force, but also by the weakness it imposes on the whole physical structure.

If, in spite of repeated menaces there is no inhibition, the individual is hardly, if at all, capable of education in this respect. But if inhibition is produced the result is that, in virtue of a well known law, an association tends to be formed between the two states: the first calls forth the second—its corrective—and from habit inhibition becomes more and more easy and rapid. With those who are masters of themselves inhibition takes place with the certainty that always marks a fully developed habit. Of course temperament and character are of more importance than education.

Hence it is not matter of surprise that a storm of passion should give way before a passionless idea, before states of consciousness whose motor tendency is quite weak. The reason is that back of these lies an accumulated force, latent and unconscious, as we shall see.

To understand this paradox, we must study, not the educated adult person, who reflects, but the child. In the child—and the savage, the man of gross nature and incapable of education is comparable to a child—the tendency to act is immediate. The work of education consists precisely in awakening these antagonistic states. And by education we understand not only the training the child gets from others, but also that which he acquires by himself.

I do not consider it necessary to prove that all sentiments and feelings which produce inhibition, as fear or respect for persons, law, usage, fear of God, and the like, originally were and ever are depressive states which tend to diminish action.

In short, the phenomenon of inhibition may be accounted for, in a way sufficient for our purpose, by an analysis of the psychological conditions under which it occurs, whatever theory one may entertain as to its physiological mechanism. It were no doubt desirable to have clearer notions on this point, to have a fuller understanding of the *modus operandi* whereby two almost simultaneous excitations neutralize each other. Were this obscure question cleared up our conception of the will as a power of inhibition would be more precise, and perhaps it

would be different. But we must needs wait for this consummation. We shall again meet this difficult problem under other forms.

So far we have been considering voluntary activity under an exclusively analytical form, but this can give us no exact idea of it, nor exhibit it in its totality. It is neither a simple transformation of states of consciousness into movement, nor a mere power of inhibition: it is a reaction proper to the individual. We must dwell upon this point, for without it the pathology of the will is unintelligible.

The primary character of voluntary movements consists in their being *adapted*, but this character they have in common with the vast majority of physiological movements: the difference is only one of degree.

Apart from movements of the pathological order (convulsions, chorea, epilepsy, etc.), which occur in the form of a violent and irregular discharge, adaptation is found from the top to the bottom of the scale.

Ordinary reflex actions are reactions of the spinal cord adapted to conditions that are very general and therefore very simple; and they are uniform and invariable between one individual and another, save in exceptional cases. They possess a *specific* character.* Another group of reflex actions represents the reactions of the base and of the middle portion of the encephalon—the medulla, the corpora striata, the optic thalami. These reactions too are adapted to general conditions that vary little, but which are much more complex: they exhibit the "sensorimotor" activity of some authors. Even these are specific rather than individual, being very much the same in all the individuals of the same species.

The reflex actions of the brain, especially those of the highest type, consist of a reaction adapted to conditions highly complex, variable and instable, and differing between one individual and another, and from one moment to another in the same individual. These are the ideomotor reactions—volitions. How perfect soever this adaptation may be, it does not concern us here. It is only an effect, the cause of which is, not volition, but intellectual activity. The intelligence being a correspondence, a continual adjustment of internal relations to external, and in its highest form a perfectly coördinated ad-

* That is, they belong to the *species*.—TRANSLATOR.

justment, the coördination of these states of consciousness implies coördination of the movements that express them. So soon as an end is chosen, it acts after the manner of what is called by metaphysicians a final cause: it involves the choice of the means proper for its attainment. The adaptation therefore is a result of the mechanism of the intelligence. This point need not detain us.

But what interests us is this *choice*, this preference declared after a longer or shorter comparison of the motives. This it is which represents the individual reaction, as distinguished from the specific reactions: in the pathology of the will the former is sometimes superior, sometimes inferior to the latter.

What is this choice? Considered in its form, it is nothing but a *practical* affirmation, a judgment that executes itself. It is to be noted that considered physiologically and from without there is nothing to distinguish a voluntary from an involuntary movement: the mechanism is the same whether I wink my eyes reflexly or as a signal to an accomplice.* Considered psychologically and from within, there is nothing to distinguish a judgment in the logical sense of that term, *i.e.*, a theoretic affirmation, from a volition, save that the latter expresses itself by an act and thus is a judgment put in execution.

But what is it considered in its essence and not merely in its form? We will dwell for a moment on this point and will endeavor to throw some light upon it. By descending to a few very lowly biological facts we shall perhaps better understand wherein a choice consists. I shall not wander afield in search of analogies—for instance, the affinity of the magnet for iron. In the vegetable kingdom I shall simply quote the fact that insectivorous plants, as *Dionæa*, choose certain bodies that come in contact with them, to the exclusion of other bodies. So too the *Amœba* chooses certain organic fragments for its nourishment. These facts are incontestable, but they are difficult of interpretation. They are explained in a general way on the theory of a relation between the molecular composition of the

organism choosing and the organic substance chosen. No doubt the choice is exercised here in a very narrow field; no doubt, too, this is the rudest form of choice. With the rise and development of a more and more complex nervous system this blind affinity is transformed into a conscious tendency, and then into several contradictory tendencies whereof one gains the mastery—the one which represents the maximum of affinity. Example: a dog hesitating between several pieces of meat and choosing one. But in every case the choice expresses the nature of the individual at a given moment, under given circumstances, in a given degree: that is to say, the weaker the affinity the less marked the preference. Hence we may affirm that the choice, whether it results from one tendency or from many tendencies, from a present sensation, from images recalled, from complex ideas, or from complicated calculations projected into the future, is always based on an affinity, an analogy of nature, an adaptation. This is true of animals whether the lower or the higher, and of man, with respect either to vice or to virtue, science, pleasure or ambition. To restrict our remarks to man, two or more states of consciousness arise as possible ends of action; after some oscillations one end is preferred, chosen. Why so, unless it is that between this state and the sum of states conscious, subconscious and unconscious (the latter purely physiological) which at this moment constitute the person, the Ego, there exists agreement, analogy of nature, affinity? This is the only possible explanation of the choice, unless we say it is without a cause. Some one suggests that I kill my friend: that tendency is rejected with horror, excluded; that is to say it is in contradiction to my other tendencies and feelings, there is no association possible between it and them, and by that very fact it is suppressed.

In the mind of the criminal on the contrary there appears to be a certain agreement, that is an analogy, between the murder and his feelings of hate or avarice, and consequently it is chosen, affirmed as something that ought to be. Hence considered as a state of consciousness, volition is nothing but an affirmation (or a negation). It resembles a judgment, with this difference, that the one expresses a relation of agreement (or disagreement) between ideas, while the other expresses the same relation between tendencies; that while the one is a repose for the mind, the other is a stage of progress

* Physiologists distinguish between voluntary and involuntary muscles, but admit that the distinction is in no wise absolute. There are persons, like E. F. Weber, the physiologist, who can at will stay the movements of the heart; others, like Fontana, who can produce contraction of the iris, and so on. A movement is voluntary when, after repeated successful experiments, it becomes associated with a state of consciousness and falls under its control.

toward action; while the one is an acquisition, the other is an alienation, for intelligence is a saving and will an expenditure. But volition in itself, as a state of consciousness, has no more power of producing an act than the judgment has of producing a truth. That power comes from another source. We will return, toward the conclusion, to this important point.*

The ultimate reason of choice is therefore in the character, that is to say in that which constitutes the distinctive mark of the individual in the psychological sense, and differentiates him from all other individuals of the same species.

Is the character, or, to use a more general term, the person, the Ego, which for us is a cause—is it in its turn an effect? Undoubtedly it is, but we are not concerned here with the causes which produce it. The science of character, which 40 years ago John Stuart Mill regarded as a desideratum, does not yet exist, nor will it ever, in my opinion. Were there such a science we should have only to accept its results, without essaying an excursion into its domain, for to be ever tracing effects to their causes would be to follow the devious steps of metaphysics. As regards the matter in hand, we repeat, character is an ultimate fact, a true cause, though for another order of research it is an effect. We would remark in passing, and as a simple suggestion, that character—the Ego so far as it reacts—is an exceedingly complex product to the formation of which heredity and physiological circumstances both anterior and posterior to birth, as education and experience, have contributed. We may also affirm that what constitutes character is affective states, and the individual's own feelings, much more than any intellectual activity. It is the general tone of the individual's feelings, the general tone of his organism that is the first and the true motor. If this is lacking, the individual cannot exercise will at all, as we shall learn from pathology. It is precisely because this

fundamental state is, according to the individual constitution, stable or fluctuating, continuous or variable, strong or weak, that we have three principal types of will—strong, weak and intermittent—with all intermediate degrees and shades of difference between the three. But these differences, we repeat, spring from the character of the individual, and that depends upon his special constitution. We cannot push the inquiry beyond that point.

We are thus fully in agreement with those who say that the predominance of a motive by itself does not explain volition. The preponderant motive is only a part of the cause, and always the weakest part too, though the most visible: nor has it any efficaciousness except inasmuch as it is chosen, that is, as it forms an integral part in the sum of the states constituting the Ego at a given moment, and as its tendency to action is added to the group of tendencies that spring from the character, forming one with them.

Hence it is not necessary to look on the Ego as an entity nor to place it in some transcendental region, in order to recognize in it a causality of its own. It is a very plain fact of experience; the contrary is incomprehensible.

Physiologically all this means that the voluntary act differs both from simple reflex action, where one impression is followed by one contraction, and from the more complex forms of reflex action where one impression is followed by a number of contractions; that it is the result of the entire nervous organization, which itself reflects the nature of the whole organism, and which reacts in consequence.

Psychologically it means that the voluntary act in its complete form is not merely the transformation of a state of consciousness into movement, but that it presupposes the participation of that whole group of conscious or subconscious states which make up the Ego at a given moment.

We are therefore justified in defining the will to be an individual reaction, and in regarding it as that which is inmost to us. The Ego, albeit an effect, is a cause, and that in the strictest sense.

To sum up, we have seen that from the lowest reflex action to the highest act of will the transition is imperceptible, and that we cannot say precisely where volition proper, that is the personal reaction, begins. The difference is most pronounced at the two ends of the series: at one end extreme simplicity, at the other extreme

* What has been said amounts simply to a statement of the evident fact that a choice proceeds always in the direction of the greatest pleasure. No animal, whether void of reason or gifted with it, whether sound or diseased can will anything save what seems to it at the moment to be its greater good or its less evil. Even the man who elects death rather than disgrace or apostasy, chooses the less disagreeable alternative. Individual character and development of the reason cause the choice now to rise very high, again to fall very low; yet always it tends toward that which promises more pleasure. The contrary is impossible. This is a psychological truth so clear that the ancients held it to be an axiom, and it has taken volumes of metaphysics to obscure it.

complexity; on one hand a reaction that is ever the same in all the individuals of the same species, on the other a reaction which varies according to the individual. Simplicity and permanence, complexity and change are here paired.

From the evolution standpoint all these reactions clearly were in their origin individual. They have become specific, from having been repeated times beyond number in the individual and in the race. The beginning of will is found in the property of reacting possessed by all living matter, and its extinction in the property possessed by living matter of acquiring habits; and it is this involuntary activity, fixed and unalterable, which serves as the groundwork and the instrument of the individual activity.

But among the higher animals the hereditary legacy, the chance circumstances of birth, the continual adaptation to conditions that vary every instant, do not permit the individual reaction to become fixed nor to assume the same form in all the individuals. The complexity of their environment is their safeguard against automatism.

Here we bring to an end these preliminary remarks, the only purpose of which was to prepare the ground for the pathology of the will, which we are now to consider.

CHAPTER II.

IMPAIRMENT OF THE WILL.—LACK OF IMPULSION.

AS we have seen, the term will denotes acts differing widely with respect to the conditions of their genesis, but all possessing this character, in common, that they represent in one form or another, in one degree or another, a reaction of the individual. Without reverting to that analysis we would for clearness' sake note two external characters which distinguish all true volition: it is a definitive state; and it is expressed by act.

Irresolution, which is the beginning of a morbid state, has inner causes which pathology will enable us to grasp; it springs from the weakness of the incitements, or from their ephemeral action. Of persons of irresolute character some—though these are very few indeed—are such from affluence of ideas. The work of comparing motives, of balancing arguments, of calculating consequences constitutes an exceedingly complex cerebral state, wherein the tendencies to action

interfere with one another. But affluence of ideas is not of itself a sufficient cause of irresolution; it is only an adjuvant. The true cause here as everywhere is in the character.

This is seen more clearly in persons of irresolute will who have few ideas. They always act in the direction of least action or of weakest resistance. Their deliberation results with difficulty in making up their minds, and after they have made a choice the next step, action, is more difficult still.

Volition on the contrary is a definitive state; it closes the debate. By it a new state of consciousness—the motive chosen—is imported into the Ego as an integral part of it, to the exclusion of other states. The Ego is thus constituted fixedly. In fickle natures this definitive action is always provisional, that is, the Ego willing is so instable a compound that the most insignificant state of consciousness that happens to arise modifies it, alters it. The compound formed at this moment has no force of resistance the moment following. In all the states conscious and unconscious that each moment represent the causes of volition, the part played by the individual character is a minimum, the part played by external circumstances a maximum. Here we have that lower form of will mentioned before which is simply permissive.

We must not forget that to will is to act and that volition is a passing to action. To reduce the will as some do to a simple resolution, that is, to the theoretic affirmation that such or such an act will be done, is to base it upon an abstraction. Making the choice is but one step in the will process. If it does not translate itself into act, whether immediately or at the fit time, then it is in no wise distinguishable from a logical operation of the mind.

The diseases of the will we divide into two principal classes, accordingly as they indicate that the will is *impaired*, or that it is *abolished*.

Impairment of the will constitutes the most important part of its pathology; it exhibits the will mechanism deranged. We shall consider cases of impairment of the will under two heads, viz.: 1. Impairment of the will from lack of impulse; 2. Impairment of the will from excess of impulse. We will consider separately, 3, impairment of voluntary attention, on account of its great importance. And 4, under the head of "Caprices," we will study a special state, wherein will either is not constituted at all, or only by accident.

The first group comprises certain simple and well defined phenomena that may be studied with profit. We find in the normal state many of the elements of this group in those soft and pliant characters who in order to act require that another will should be joined to theirs; but disease will exhibit to us this state enormously exaggerated. Guislain has described in general terms that impairment which physicians designate by the term *aboulia*: "The patients," he says, "can will to themselves, mentally, according to the dictates of reason. They may feel a desire to act, but they are powerless to make a move toward that end. . . . Their will cannot overpass certain bounds: one might say that this force of action undergoes an arrest. The *I will* is not transformed into impulsive will, into active determination. Some patients are themselves surprised at the impotence with which their will is stricken. . . . Left to themselves, they will pass whole days in bed, or sitting in a chair. When spoken to or aroused, they speak rationally though curtly; they judge of things fairly enough."*

As those patients are the most interesting whose intelligence is intact, we shall cite such cases only. One of the earliest observations, and the best known of all, we owe to Esquirol. "A magistrate," he writes, "highly distinguished for his learning and his power as a speaker, was seized with an attack of monomania, in consequence of certain troubles of mind. He regained entirely his reason, but he would not go into the world again, though he acknowledged himself to be in the wrong in not doing so; neither would he attend to his business though he well knew that it suffered in consequence of this whim. His conversation was both rational and sprightly. When advised to travel or to attend to his affairs, 'I know,' he would answer, 'that I ought to do so, but I am unable. Your advice is very good; I wish I could follow it; I am convinced; but only enable me to will, with the will that determines and executes. . . . It is certain,' said he one day to me, 'that I have no will save not to will, for I have my reason unimpaired, and I know what I ought to do, but strength fails me when I ought to act.'" †

Prof. J. H. Bennett records the case of

"a gentleman who frequently could not carry out what he *wished* to perform. Often on endeavoring to undress he was two hours before he could get off his coat, all his mental faculties, volition excepted, being perfect. On one occasion having ordered a glass of water, it was presented to him on a tray, but he could not take it, though anxious to do so; and he kept the servant standing before him half an hour, when the obstruction was overcome." He described his feelings to be "as if another person had taken possession of his will."*

Thomas De Quincey describes this paralysis of the will from personal observation. His remarks are the more valuable as coming from a man of subtle mind and fine literary tact. From the effects of long continued abuse of opium he was compelled to give up the studies in which he had been wont to delight. "I shrunk from them," he writes, "with a sense of powerlessness and infantine feebleness the greater from remembering the time when I grappled with them [mathematics, intellectual philosophy, etc.] to my own hourly delight; and for this further reason, because I had devoted the labor of my whole life to . . . constructing one single work. . . . This was now likely to stand a memorial of hopes defeated, of baffled efforts, of materials uselessly accumulated. . . . In this state of imbecility I had for amusement turned my attention to political economy." He speaks of "the utter feebleness of the main herd of modern economists" with whose writings he had been familiar. At length he read Mr. Ricardo's book, and before he had finished the first chapter, wonder and curiosity that had long been dead in him were re-awakened. Conceiving however that some important truths had escaped even Ricardo's eye, he drew up his "Prolegomena to all Future Systems of Political Economy." Arrangements were made for printing this work, and it was even twice advertised. But the author had a preface to write and a dedication to Ricardo, and he found himself quite unable to accomplish all that. So the arrangements were countermanded and the "prolegomena" was not published. "I have thus described and illustrated my intellectual torpor in terms that apply more or less to every part of the four years during which I was under the Circean spells of opium. But for misery and suffering, I might in-

* Guislain, "Leçons Orales sur les Phrénopathies," vol. i., p. 479. See also Griesinger, "Traité des Maladies Mentales" (French translation), p. 46; Leubuscher, "Zeitschrift für Psychiatrie," 1847.

† Esquirol, l. 420.

* Quoted by Carpenter, "Mental Physiology," p. 385, from Bennett, "The Mesmeric Mania of 1851."

deed be said to have existed in a dormant state. I seldom could prevail on myself to write a letter; an answer of a few words to any that I received was the utmost that I could accomplish; and often that not until the letter had lain weeks or even months on my writing table. Without the aid of M. all records of bills paid or to be paid must have perished, and my whole domestic economy, whatever became of Political Economy, must have gone into irretrievable confusion. I shall not afterward allude to this part of the case; it is one however which the opium eater will find in the end as oppressive and tormenting as any other, from the sense of incapacity and feebleness, from the direct embarrassments incident to the neglect or procrastination of each day's appropriate duties, and from the remorse which must often exasperate the stings of these evils to a reflective and conscientious mind. The opium eater loses none of his moral sensibilities or aspirations; he wishes and longs as earnestly as ever to realize what he believes possible and feels to be exacted by duty; but his intellectual apprehension of what is possible infinitely outruns its power not of execution only but even the power to attempt. He lies under the weight of incubus and nightmare; he lies in sight of all that he would fain perform, just as a man forcibly confined to his bed by the mortal languor of a relaxing disease, who is compelled to witness injury or outrage offered to some object of his tenderest love: he curses the spells which chain him down from motion; he would lay down his life if he might but get up and walk; but he is powerless as an infant and cannot even attempt to rise."*

I shall cite only one observation more. It is recorded by Billod in the "Annales Médico-pathologiques," and exhibits the disease in all its aspects. The patient was a man 65 years of age, "of strong constitution, of lymphatic temperament, with a faculty specially developed for business, and of middling sensibility." Being strongly attached to his profession (he was a notary) he hesitated long before he decided to sell his office. Having done so, he fell into a state of profound melancholy, refusing all food, deeming himself undone, and going so far in his desperation as to attempt suicide. In the narrative which follows I omit only a few details of purely medical interest, and per-

mit the observer to describe the case in his own words:

"The faculty that seemed to us to be most notably affected was the will. The patient oftentimes manifests an inability for willing to perform certain acts although he has the wish, and although his sound judgment, after prudent deliberation, convinces him of the fitness and often even the necessity of so acting." The patient was at this time confined in the asylum at Ivry, and it was desired that he should go to Italy with Dr. Billod.

"When told that he must soon leave, 'I never can,' said he, 'yet I am tired of this place.' On the eve of his departure he again protested that he never could leave. The next morning he rose at six o'clock to go and make the same declaration to Mr. M. Some resistance therefore was anticipated, yet when I presented myself he made no opposition whatever, saying only, as though he felt that his will was ready to lapse, 'Where is the coach, so I may lose no time in getting into it.'"

"It would be tiresome were we to take the reader with us and exhibit to him all the phenomena presented by the patient during this tour. These phenomena may conveniently be represented by three or four of the principal ones which I shall offer as a sample of all the rest. The first presented itself at Marseilles. The patient was requested, before he took ship, to execute a paper authorizing his wife to sell a house. He drew up the document himself, made a copy on stamped paper, and was in the act of signing his name when a difficulty arose for which we were quite unprepared. After having written his name, he was utterly unable to make the flourish. In vain he struggled to overcome the difficulty. A hundred times at least he went through the requisite movements with his hand raised above the paper—proving that the obstacle was not in the hand; a hundred times the will was unable to command the fingers to bring the pen down to the paper. Mr. P. was in an agony. He would rise from the desk with impatience, and stamp on the floor: then he would sit down again and try once more. Still he could not bring the pen to the paper. Will any one deny Mr. P.'s strong desire of completing his signature or assert that he does not understand the importance of the act? Will any one question the soundness of the organ that has to execute the flourish? The agent (the hand) seems to be as free from defect as the legal instrument, but the former cannot apply itself to the latter. Plainly the will is at fault. This struggle lasted three quarters of an hour. At last the effort had some result, after I had given up all expectation of any. The flourish was very imperfect, but it was executed. I was an eye witness of this struggle, taking the liveliest interest in it, and I declare that

* "Confessions of an Opium Eater," Boston edition, 1851, p. 106 *et seq.*

it was impossible to give more manifest proof of the impossibility of willing, in spite of the desire.*

"A few days later I observed another instance of disability of a kindred nature. It was proposed to go out for a little while after dinner. Mr. P. wished very much to do so, desiring, as he told me, to get some idea of the appearance of the city. For five days in succession, he took his hat, arose from table, and got ready to go out. Vain hope! His will could not command his legs to put themselves in motion, and carry him into the street. 'Evidently I am my own prisoner,' he would say; 'it is not you that prevent me from going out, nor is it my legs that refuse; then what is it?' Thus would Mr. P. complain of his *not being able to will*, much as he wished it. At last, after five days, he made a final effort, and succeeded in getting out of doors, but five minutes later he came back perspiring and out of breath, as though he had run a distance of several kilometers, and much astonished himself at what he had just done.

"Instances of such inability were occurring every moment. If the patient longed to go to the theater, he could not will to go. If at table with agreeable company he wished to take part in the conversation, the same inability was experienced. True, oftentimes this lack of force existed, so to speak, in apprehension only: the patient feared lest he should not be able, and yet he succeeded in more instances than he failed: often however, it must be admitted, his apprehensions were justified."

After passing six days at Marseilles, patient and physician took ship for Naples, "though not without the utmost difficulty." During these six days

"the patient formally expressed his disinclination to embark, and his desire of going back to Paris, dreading in advance the thought of finding himself, with his diseased will, in a strange country, and declaring that he would have to be taken on board in irons. On the day appointed for sailing, he made up his mind to leave the hotel only when he believed that I was about to resort to force. Once outside the door, he stopped on the street, and there no doubt would have remained, were it not for the intervention of some sailors, and they had only to show themselves.

"Another circumstance goes to show still further the lesion of the will. We reached Rome on the day of Pius the Ninth's election. 'This is a fortunate circumstance, I should say,' he remarked, 'were I not ill. I wish I could assist at the coronation, but I do not

know that I can. I shall try.' On the morning of the day he arose at five o'clock, shaved, took out his black coat, etc., and said to me, 'You see I am doing a good deal; I do not yet know whether I shall be able to go.' At last, when the hour for the ceremony was come, he made a great effort, and with much ado succeeded in going down stairs. Ten days afterward, on the feast of St. Peter, after making the like preparations, and the same efforts, no result was reached. 'You see,' he said, 'I am still my own prisoner. It is not the wish that is wanting seeing that I have been getting ready for the last three hours. Here I am dressed, shaven and gloved, yet I cannot budge from here.' In short it was impossible for him to attend the ceremony. I had used a good deal of urgency, but judged that I must not force him.

"I will conclude this narrative, already too long, with one observation. It is that the instinctive movements—those which are not subject to the will proper—were not affected in this patient like those which may be called the ordained movements. Thus, on arriving at Lyons, upon our return journey, our coach ran over a woman that the horses had thrown down: my patient regained all his energy, and not waiting for the vehicle to stop, threw off his cloak, opened the door, and was the first to descend and offer assistance to the woman."

The author adds that the voyage had not the good effect he had anticipated; that the patient however felt better when riding in a carriage, especially in a jolting vehicle over a rough road; and thus he went home to his family in about the same state.*

The cases just cited represent a very definite group. From them we gather some very precise facts, and a few highly probable inferences. And first let us consider the facts.

1. The muscular system and the organs of movement remain intact: they offer no impediment. The automatic activity which constitutes the ordinary routine of life persists.

2. The intelligence is intact—at least there is nothing that would warrant us in saying that it has suffered in the least. Ends are clearly apprehended, means likewise, but to pass to action is impossible.

Here then we have a disease of the will in the strictest sense. And we may remark that disease makes for our behoof a curious experiment. It creates exceptional conditions, such as can be produced in no other way: it makes two halves of the man, utterly extinguishing all power of individual reaction, but leaving intact all else; it produces for us, so far as the

* *Je déclare qu'il était impossible de constater plus manifestement une impossibilité de vouloir, malgré le désir.* I transcribe this observation literally, without any reflection upon the author's psychological doctrine. (Author's note.)

* "Annales Médico-Psychologiques," vol. x.

thing is possible, a being reduced to pure intelligence.

Whence comes this impotence of will? Here the inductions begin. As to its immediate cause two hypotheses only are possible: it consists of an impairment either of the motor centers or of the incitements they receive.

The first hypothesis has no valid reason to rest on.* At least we know too little about this matter to warrant even conjecture.

The second hypothesis remains. Experience confirms it. Esquirol has preserved for us the remarkable answer made to him by a patient who had been cured: "This lack of activity was owing to the fact that my sensations were too faint to exert any influence on my will." The same author has also noted the profound change such patients experience in their general sense of existence (cœnæsthesia). "My existence is incomplete," writes one of his patients to him. "The functions, the power of performing the ordinary acts of life, remain with me: but in the performance of them there is always something wanting, to wit, the sensation proper to each and the pleasure that follows them. Each one of my senses, each part of myself is, so to speak, separated from me, nor can it now procure for me any sensation." No psychologist could better define the point at which the affective life of the patient was impaired.

Billod relates the case of a young Italian woman "of brilliant education" who became insane from having been crossed in love; she recovered, but afterward fell into a profound apathy. "She reasons soundly on every subject, but no longer has any power of will or of love; no consciousness of what happens to her, of what she feels or of what she does. She says she is as one that is neither dead nor alive; like one living in continual sleep, to whom objects appear as though wrapt in a cloud, to whom persons seem to move like shadows, and words to come from a world far away."†

If, as we shall see later, the voluntary act is made up of two distinct elements, viz., a state of consciousness totally incapable either of producing action or prohibiting it, and organic states which alone have this power, then it must be admitted that the two elements, though usually they

are simultaneous, as being the effects of one same cause, are here dissociated. The inability to act is a fact. But the intensity of the state of consciousness, which intensity is clearly intermittent—is that a fact? If so, then we must say that the requisite conditions are present here, but only so far as this element is concerned. But is this intensity of consciousness an illusion? I am inclined to believe that it is. The strong desire to act that some of the patients suppose themselves to have seems to me to be simply an illusion of consciousness. The intensity of a wish is something entirely relative. The patient being in a state of general apathy, an impulse that to him appears to be strong is in fact below the average: hence inaction. When we come to study the state of the will in somnambulism we shall see that though some patients firmly believe their acts while in that state to be controllable by their will, experience at last compels them to admit that this judgment is erroneous and that their consciousness deludes them completely.*

When however an excitation happens to be very strong, sudden, unexpected, that is when it combines all the conditions of intensity, then in most cases it serves as an impulse to action, as in the case of the patient who recovered his energy to save a woman from being run over.† Every one can realize for himself this state of aboulia, for there is no one but has had his hours of weakness when all incitements, whether inward or outward, all sensations and all ideas have been ineffective, leaving him impassive. Between this state and aboulia there is only a quantitative difference—the difference between a transient and a chronic state.

If these patients are unable to will the reason is that however many projects they may conceive, only a feeble desire to act is awakened. I employ these terms in order to conform myself to the current phraseology, still it is not the weakness of the desire, as a simple state of consciousness, that produces inaction. To infer that it is, is to reason from mere appearances. As we have already shown, every nervous state—every sensation, every idea—is all the more surely translated into movement, as it is accompanied by those other nervous states, whatever they may be, which correspond to feeling and sentiment. It is from the weakness

* It must be remembered that we are speaking not of the motor organs, but of the centers, whatever opinion may be held as to their nature and their localization.

† "Annales Médico-Psychologiques," *ubi supra*.

* See Chapter VI., *infra*.

† I learn from Dr. Billod that this patient regained his activity, in consequence of the events of June, 1848, and the emotions they excited in him.

of these states that aboulia results, and not from weakness of desire, which is only a sign.

The cause therefore is a comparative insensibility, a general impairment of sensibility: that which is impaired is the affective life, the emotional faculty. But whence comes this morbid state? The question is purely a physiological one. Indisputably there exists in these patients a notable depression of the vital activities; and this may attain to such a degree as to involve all the faculties, so that the individual becomes like some inanimate thing. Physicians call this state melancholia, lypemania, stupor, and its symptoms are a slowing of the circulation, a lowering of the temperature of the body, and an almost absolute immobility. These extreme forms do not belong to our theme, but they exhibit to us the ultimate causes of impotence of the will. Every depression in the vital tone, be it slight or be it grave, transient or lasting, has its effect. So little is the will like a faculty controlling as a master, that it depends momentarily upon the most trivial causes: it is at their mercy. And yet, inasmuch as it has its source in biological actions that take place in our inmost tissues, we see how truly it is said to be our very self.

The second group is like the first in its effects (impairment of the will) and in its causes (depressive influences). The only difference is that the incitement to act is not suppressed. The first group presents positive causes of inaction; the second, negative causes. Inhibition results here from an antagonism.

In all the cases now to be mentioned the impairment of the will springs from a sense of fear, based on no rational ground, and varying from simple anxiety to anguish and paralyzing terror. In some instances the intelligence appears to be intact, in others impaired. Again, some of these cases are of an indefinite character, and it is difficult to say whether they indicate a disease of the will alone.*

The following case shows the transition from one group to the other; in fact it belongs to both. "A man of 30 years found himself involved in certain civic tumults which frightened him greatly. Thereafter, though he retained perfectly his mental balance, managing his private

affairs very well and carrying on a large business, he would not remain alone either on the street or in his chamber, but was always accompanied. If he went out, it was impossible for him to return home alone. Whenever he went out unattended, which he rarely did, he would soon halt on the street, and there remain indefinitely, neither going on nor turning back, unless some one led him. He seemed to have a will, but it was the will of those around him. Whenever the attempt was made to overcome this resistance of the patient, he would fall into a swoon."*

Several alienists have recently described under the names of "peur des espaces," "Platzangst," and agoraphobia, a curious sort of anxiety that paralyzes the will, and against which the individual is powerless to react, or at least does so only in a roundabout way. A case observed by Westphal may serve as a type. A traveler of strong constitution, perfectly sound of mind and presenting no disorder of the motor faculty, is suddenly seized with a feeling of alarm at the sight of an open space—as a public square—of some little size. If he must cross one of the great squares of Berlin, he fancies the distance to be several miles and despairs of ever reaching the other side. This feeling grows less or disappears if he goes around the square, following the line of houses, also if he has some person with him, or even if he supports himself on a walking cane. Carpenter† quotes from Bennett a case of "paralysis of the will" which seems to me to belong to the same class. "If when walking in the street this individual [a patient of Dr. Bennett's] came to a gap in the line of houses, his will suddenly became inoperative and he could not proceed. An unbuilt-on space in the street was sure to stop him. Crossing a street also was very difficult, and on going in or out of a door he was always arrested for some minutes."

Again, some persons while walking in the open country are more or less uneasy unless they keep close to the hedges or to the trees. Many other illustrations might be given, but that is needless, for they would add nothing to the fundamental fact.‡

* Billod, *loc. cit.*, p. 191.

† Op. cit., p. 385.

* Here it is well to remark once for all that, as we are studying the diseases special to the will, we have had to eliminate all cases where the psychic activity is affected as a whole, and those in which affections of the will are only the effect and the expression of intellectual insanity.

‡ For further details see Westphal, "Archiv für Psychiatrie," vol. iii. (two articles); Cordes, *ibidem*; Legrand du Saulle, "Annales Médico-psychologiques" (1876), p. 405; Ritti, "Dictionnaire Encyclopédique des Sciences Médicales," art. FOLIE AVEC CONSCIENCE; Maudsley, "Pathology of Mind."

The medical discussions of this morbid state do not concern us here. The psychological fact is reducible to a sense of fear, and that this fear is puerile and imaginary as regards its causes makes no difference for us: we have to do only with its effect, which is to disable the will. But we must inquire whether this depressive influence only arrests the will-impulse, the latter being in itself intact, or whether the power of individual reaction also is weakened. The latter hypothesis is well grounded for, the sense of fear not being insurmountable—as these patients prove in some instances—we must infer that the individual's power of reaction is fallen below the general level. Hence the arrest of volition results from two causes acting in the same direction.

Unfortunately we are ignorant of the physiological conditions of this impairment. Many are the conjectures that have been made. Cordes, himself subject to this infirmity, regards it as "a functional paralysis symptomatic of certain modifications of the motor centers, and capable of producing upon us impressions, in particular an impression of fear, which gives rise to a momentary paralysis; this effect is almost nothing if the imagination alone is in play, but it is carried to a very high degree by the operation of the accompanying circumstances." According to Cordes, then, the primary cause is "a paresic exhaustion of the motor nervous system, of that portion of the brain which governs not only locomotion but muscular sensibility also."

This explanation, were it firmly established, would be of great consequence for our research. It would show that the impotence of the will depends on an impotence of the nerve centers—and this would have the advantage of supplying to our inquiries an assured basis in physiology. But it would be premature to draw here conclusions that will come in more fitly at the end of our work.

I shall have little to say of the mental state denominated "grübelnsucht." It represents the pathological form of irresolution of character, just as aboulia represents that of the apathetic character. It consists of a state of continual hesitation, for the most frivolous reasons, with inability to reach any definitive results. This hesitation is seen at first in the purely intellectual order. The patient keeps asking himself questions continually. I take an illustration from Legrand du Saule. "A very intelligent woman could not go into the street but she would

be asking herself, 'Is some one going to jump out of a window and fall at my feet? Will it be a man or a woman? Will the person be wounded or killed? If wounded, will it be in the head or the legs? Will there be blood on the pavement? Shall I call for assistance, or run away, or recite a prayer? Shall I be accused of being the cause of this occurrence? Will my innocence be admitted?' and so on. These questionings go on without end. Several cases of a like nature are recorded in special treatises."*

If it involved only this "psychological rumination,"—to use Mr. du Saule's expression—we should have nothing to say about this morbid state; but the perplexity of the mind expresses itself in acts. The patient durst not attempt anything without endless precautions. If he has written a letter, he reads it over and over again, for fear he should have forgotten a word or committed some fault of spelling. If he locks a drawer, he must make sure again and again that it was done aright. It is the same as to his dwelling: he has to satisfy himself repeatedly as to the doors being locked, the keys in his pocket, the state of his pocket, etc.

In a graver form of the malady the patient, haunted by ridiculous abhorrence of contact with anything dirty or unclean, will not touch a piece of money, a door knob, a window fastening or the like; and he lives in a state of constant apprehension. Such was the cathedral beadle mentioned by Morel, who, worried for twenty-five years by absurd fancies, feared to touch his staff; the man would reason with himself, and rail at himself till his apprehensions were counteracted, yet he always was afraid that the next time he should not succeed.†

This malady of the will results in part from weakness of character, in part from the state of the intelligence. It is quite natural that this current of vain imaginings should find expression in frivolous acts; but the impotence of the individual reaction plays an important part. We find also a lowering of the general tone, and the proof of this is seen in the causes of this morbid state, namely hereditary neuropathy and debilitating maladies; also in the crises and the syncope brought on by the effort to act; so too in those extreme forms of the disease where

* See particularly Legrand du Saule, "La Folie du Doute avec Délire du Toucher" (1875); Griesinger, "Archiv für Psychiatrie" (1869); Berger *ibidem* (1876); Ritti, "Dict. Encycl.," *loco citato*.
† "Archives Générales de Médecine" (1866).

the patient, harassed by his unceasing apprehensions, will neither write, nor listen, nor speak, but keeps muttering to himself, or perhaps only moving his lips.

Finally let us notice those cases in which the impairment of the will approaches extinction. When a persistent state of consciousness is accompanied by an intense feeling of terror, there is produced an almost absolute inhibition, and the patient seems stupid without really being so. Such was the case with the young man mentioned by Esquirol, who appeared to be idiotic, who had to be dressed, put to bed, fed like a child, and who after his recovery declared that an inward voice used to say to him, "Do not budge, or you are dead."*

Guislain also reports a curious case, but in this instance the lack of psychological data leaves us in a quandary and no positive explanation can be offered. "A young lady, courted by a young man, was seized with an alienation of mind the true cause of which was unknown, but its distinctive feature was a strong aversion to society, which soon was transformed into a morbid mutism. During twelve years she made answer to questions only twice, the first time under the influence of her father's imperative words, and the second time on her being committed to an asylum. On both occasions she was strangely, surprisingly laconic."

For two months Guislain made repeated efforts to effect a cure. But "my efforts were vain, and my exhortations without effect. I persisted, and before long noted a change in her features, and a more intelligent expression in her eyes. Shortly afterward, from time to time, she would utter sentences, expressing her thoughts clearly, but this was at long intervals, for she manifested extreme repugnance to comply with my requests. It was evident that her self-love was each time gratified by the victory she gained over herself. In her answers it was impossible to detect the slightest sign of disordered intellect: her insanity was purely a disease of the impulsive will. Oftentimes a sort of bashfulness seemed to restrain this patient, whom I was beginning to regard as convalescent. For two or three days she ceased to speak, and then, yielding to renewed solicitations, she recovered speech again, till finally she took part of her own accord in the conversation going on in her hearing. . . . This recovery is one of the most surprising in-

stances of cure that have come under my observation." The author adds that restoration was complete and permanent.

This state of morbid inertia, of which *aboulia* is the type, where the "I will" is never followed by action, shows volition, as a state of consciousness, and the effective power of acting to be two distinct things. Not to dwell on this point at present, let us direct our attention to this fact of effort—a vital point in the psychology of the will, and which is lacking here.

The feeling of *muscular* effort has been studied so thoroughly and so minutely by Dr. William James* that there is no need of going over the ground again; it will suffice to recall his conclusions. That physiologist has shown that the sense of the muscular force expended in the performance of an act is a complex afferent sensation coming from the contracted muscles, the tense ligaments, the compressed articulations, the shut glottis, etc. He considers in detail, taking his stand upon the results of experiment, the opinion which holds it to be an *afferent* sensation connected with the motor discharge and coincident with the *outgoing* current of nervous energy. In particular he has shown, after Ferrier and other writers, that if in case of paralysis the patient retains the feeling of effort though quite unable to move the paralyzed member, the reason is because the conditions of the consciousness of effort persist, the patient moving the opposite member or organ.

But Dr. James justly distinguishes the *muscular* from the *volitional* effort which in many cases either involves no immediate movement at all, or only an exceedingly weak muscular energy. This we see in the case of the man who, after long hesitation, decides to put arsenic into his wife's glass to poison her: and every one is familiar through personal experience with this state of mental struggle in which the effort is all internal. But here we part regretfully with this author who locates this effort in a region apart and supersensible. To us it seems to differ from muscular effort only in this one point: its physiological conditions are ill understood, and we can offer only hypotheses.

There are two types of this volitional effort, of which the one consists in arresting the instinctive, the passional, the habitual movements, the other in overcoming languor, torpor, timidity. The one is an effort with a negative and the other an ef-

* Esquirol, vol. ii., p. 287.

* "The Feeling of Effort," Boston, 1880

fort with a positive result: the one produces inhibition the other impulsion. These two types may themselves be reduced to one formula: there is effort when the volition follows the line of greatest resistance. This volitional effort never takes place when the impulsion (or the inhibition) and the choice coincide, when our natural tendencies and the "I will" go in the same direction: in simpler language, when that which is *immediately* agreeable to the individual and that which is chosen by him are the same. It always takes place when two groups of antagonistic tendencies are struggling to supplant each other. As every one knows, this struggle takes place between the lower tendencies, whose adaptation is restricted, and the higher tendencies, whose adaptation is manifold. The former are always by nature the stronger; the latter are sometimes the stronger on account of adventitious circumstances. Again, the former represent a force enregistered in the organism; the latter a recent acquisition.

How comes it then that these naturally weaker tendencies prevail? It is because the "I will" is an element in their favor—this, of course, not inasmuch as it is a mere state of consciousness, but because underneath this volition there exist the causes known, half-known, or unknown which we have often designated by the term individual character. These minor active causes, which constitute the individual physically and psychically, are not mere abstractions: they are physiological or psychophysiological processes; they presuppose work done in the several nervous centers. Is it rash to maintain that the feeling of volitional effort too is an effect of these physiological processes? The only objection that can be urged is our inability to determine its mechanism. This point is all the more obscure because the mechanism must be different according as the effect to be produced is an impulsion or an inhibition; so too the feeling of volitional effort is not the same in the two cases.

The inward struggle is accompanied by a sense of fatigue often intense. Though we know but little about the nature and the causes of this state, it is generally supposed that even in muscular effort the seat of fatigue is in the nerve centers that call forth the contraction, not in the muscles: that there is nervous exhaustion, not muscular. In reflex contractions no fatigue is felt. Among subjects of hysteria contractions are seen to persist indefi-

nately, and yet the patient has no sense of lassitude; hence it is the voluntary effort that causes fatigue and not the contraction of muscle.*

Apart from our ignorance, we have no reason to attribute to the volitional effort a peculiar character. Are the nerve elements capable of furnishing a surplus of work for a given period in all cases where this volitional effort comes into play? Or, on the contrary, are they, owing to their nature or for the want of training and exercise, quickly exhausted and incapable of acquiring fresh strength? Have they or have they not a sufficiency of available force stored up? The problem of action in the direction of greatest resistance is reduced to its ultimate terms. It is this hidden, almost unsuspected work that makes itself known through the feeling of volitional effort. Hence the feeling of effort in all its forms is a subjective state corresponding to certain processes going on in the nerve centres and in other portions of the organism, but differing from them even as the sensation of light or of sound differ from their objective causes. To be capable of great muscular effort, the appropriate nerve centers must be able to produce a good deal of work for a prolonged period, and this depends on their constitution and on the rapidity with which they repair losses. So too, to produce a great moral or intellectual effort, the appropriate nerve centers, whatever they may be (and our ignorance touching this point is nearly total), must be able to produce intense work over and over again, and must not be quickly exhausted and slow to repair losses. The capacity for effort is therefore in the last analysis a natural gift.

To make our meaning clearer take the case of a vicious character. Suppose that never in his life, whether spontaneously or under the influence of others, he has experienced any faint desire of amendment: the reason is, because he entirely lacks the moral elements and their corresponding physiological conditions. Should the thought of amendment by any chance occur to him, it is to be remarked in the first place that this occurrence is no act of the will, though it supposes the pre-existence of certain psychophysiological elements and their being called into play. Now suppose he elects to pursue this object, approves this course, wills it; if the

* Richey, "Physiologie des Nerfs et des Muscles," pp. 477-490; Delbœuf, "Étude Psychophysique," pp. 92 et seq., in "Éléments de Psychophysique," vol. I.

resolution does not persist, it is because in the man's organization there exists no capacity for that iterated work of which we have spoken; but if the resolution does persist, it is because it is supported by an effort, by that inner work which produces arrest of the opposite states. Organs are developed by exercise, and this holds good here; so that repetition becomes easy. But if nature has laid no foundation, given no potential energy, there is no result. Hence the theological doctrine of grace as a free gift appears to be bottomed on a far more correct psychological theory than the opposite opinion,* and we see how easily it might be made to undergo a physiological transformation.

To return to the morbid forms that are the objects of our study, they involve a temporary, accidental incapacity for effort, which however extends to almost the entire organism.

CHAPTER III.

IMPAIRMENT OF THE WILL.—EXCESS OF IMPULSION.

WE have just been considering instances in which, though the intellectual adaptation—that is the correspondence between the intelligent being and his environment—is normal, the impulse toward action is either null, very weak, or at least insufficient. In the language of physiology, the cerebral actions which are the basis of intellectual activity (as the thought of ends and of means, choice, etc.), remain intact, but they lack the concomitant states which are the physiological equivalents of the feelings, and the absence of these causes failure to act.

We are now to study phenomena quite the opposite of these in certain respects. In this second group the intellectual adaptation is very little, or at all events very instable; the motives dictated by reason are forceless either for action or for restraint; and the lower impulses gain what the higher impulses lose. The will, that is to say the rational activity, disappears, and the individual reverts to the domain of instinct. Nothing could prove more effectually that the will, in the strict sense of the term, is the crown, the final term of an evolution, the result of a multiplicity

of disciplined tendencies coördinated with one another; that it is the most perfect species of activity.

Let us examine the facts. We will divide them into two groups: 1. Those which, being hardly if at all conscious, denote an absence rather than an impairment of will; 2. Those which are accompanied by perfect consciousness, but in which, after a longer or shorter struggle, the will succumbs, or is saved only by assistance from without.

1. In the former case "the impulsion may be sudden and unconscious, followed by immediate execution, the understanding even not having had time to take cognizance of it. . . . In such case the act possesses all the characters of a purely reflex phenomenon, without any intervention whatever of the will: it is in fact a convulsion differing from ordinary convulsions only in that it consists of movements associated and combined in view of a determinate result. Such is the case of the woman who, seated on a bench in a garden, oppressed with unwonted sadness, suddenly rose to her feet, threw herself into a ditch full of water, as if to drown herself, and who, after being rescued and restored to herself fully, declared a few days later that she was unconscious of having wanted to commit suicide and had no recollection of the attempt she had made."*

"I have seen," says Luys, "a number of patients who repeatedly attempted suicide in the presence of those who watched them, but they had no recollection of the fact in their lucid state. And what proves the unconsciousness of the mind under these conditions is the fact that the patients do not perceive the inefficiency of the methods they employ. Thus a lady who attempted suicide whenever she saw a table knife, did not notice one day when I was watching her that I had substituted for the knife a harmless instrument. Another patient tried to hang himself with a half rotten cord that was not strong enough to bear even slight tension."†

Impulses of this kind are so frequent among epileptics that pages might be filled with accounts of them. Hysterical patients too furnish innumerable examples: they manifest an uncontrollable tendency toward the immediate gratification of their caprices or the satisfaction of their wants.

Other impulsions produce effects that

* The doctrine of grace is found even among the Hindus, particularly in the "Bhagavad Gitâ," xi., 53. Consult Barth, "Les Religions de l'Inde," pp. 48, 136.

* Foville, "Nouveau Dictionnaire de Médecine," art. FOLIE, p. 342.

† "Maladies Mentales," pp. 373, 439, 440.

are less serious, but they indicate the same psychic state. "In some patients the overexcitation of the motor forces is such that they keep walking for hours at a time without stopping, never looking about them, like mechanical figures that have been wound up." "A marchioness possessed of very great intelligence," says Billod, "would in conversation interrupt a sentence with an unseemly or an obscene epithet addressed to some one in the company, and then take up the broken sentence again. The utterance of this epithet was accompanied by a blush; the lady seemed to be annoyed and confounded, and the word was as it were jerked out, like an arrow that is shot unawares from the bow." "An aged victim of hysteria, a woman of much intelligence and very clear-headed, used to feel at certain times the need of going into some lonely place and shouting aloud; there she would give vent to her grievances and her complaints against her family and her surroundings. She knew perfectly well that it was wrong to publish certain secrets, but, as she used to say, she must speak and satisfy her grudges."*

This last case brings us to irresistible impulses that are conscious. But at present we have to do with those which are unconscious. Cases of this kind we might cite in abundance. They exhibit the individual reduced to the lowest degree of activity—that of pure reflex action. His acts are unconscious (or at least not deliberate), immediate, irresistible, and their adaptation is of little complexity and invariable. Considered from the point of view of physiology and of psychology, the human being, under these conditions, is like an animal that has been decapitated, or at least deprived of its cerebral lobes. It is generally held that the brain can govern the reflex actions, and this opinion rests upon the following grounds: An excitation, starting from any point of the body becomes divided on reaching the spinal cord, and then pursues two routes. It is transmitted to the reflex center by a transverse route, and to the brain by a longitudinal and ascending route. Since the transverse route presents the greater resistance, transmission in that direction takes some time, while transmission longitudinally on the contrary is much more rapid. Hence there is time for the suspensive action of the brain to take place and to regulate the reflex actions. The

brain being in the causes just mentioned without action, its activity remains at its lower degree and volition does not occur, its necessary and sufficient conditions not being present.

2. The phenomena of the second group are worthy of more detailed study: they explain the overthrow of the will and the artificial means that support it. The patient is fully conscious of his situation; he feels that he is not master of himself, that he is dominated by an inner force and irresistibly urged on to perform actions that he condemns. The intelligence remains sufficiently sane, and the insanity affects only the acts. We find in a work by Marc that is now almost forgotten* a rich collection of facts upon which later writers have freely drawn. We quote a few.

A lady subject at times to homicidal impulses used to request to be put under restraint by means of a strait waistcoat, and would let her keeper know when the danger was passed and when she might be allowed her liberty. A chemist haunted with similar homicidal impulses used to have his thumbs tied together with a ribbon, and in that simple restraint found the means of resisting the temptation. A servant woman of irreproachable character asked her mistress to let her go away, because she was strongly tempted to disembowel the infant she took care of whenever she saw it stripped. Another woman, a person of much intellectual cultivation and very affectionate to her relatives, "began to beat them in spite of herself and called for assistance, begging that she might be held down in an arm-chair." A victim of melancholia haunted with the thought of suicide arose in the night, knocked at his brother's door and cried out to him, "Come quick; suicide is pursuing me and soon I shall be unable to withstand it."

Calmeil in his "Traité des Maladies Inflammatoires du Cerveau" cites the following cases, of which he was a witness and which I will give in detail, for so I shall be dispensed from recounting many more:

"Glénadel having lost his father in childhood, was brought up by his mother who adored him. On attaining his 16th year his character underwent a change. Till then he had been a good and dutiful son, but now he became gloomy and taciturn. Being pressed

* Luys, *loc. citato*, 167, 212; Billod, *loc. citato*, 193 59.

* "De la Folie considérée dans ses Rapports avec les Questions Médico-judiciaires." 2 vols. 8vo. Paris, 1840.

with questions by his mother, he at length resolved to make a confession:

"To you I owe everything," he said, "and I love you dearly: still for the last few days a thought that is ever in my mind has been driving me to kill you. Do not let me at last give way to it, do not let so great a misfortune befall, but give me leave to enlist." In spite of her urgent solicitations he was immovable in his resolution, left his home and made a good soldier; yet a lurking desire was ever urging him to desert, so that he might return and kill his mother. At the close of his term of service this thought was as strong as on the first day. He enlisted for another term, and still the homicidal instinct persisted, though now another victim was substituted. He no longer thinks of killing his mother; night and day he now is conscious of a horrid impulse to murder his step-sister. In order to withstand this second impulse he condemned himself to lifelong exile from his home.

"At this juncture a man from his own neighborhood joined the regiment, and to him Glénadel confided his distressing secret. 'Cheer up,' said the other, 'that crime is out of the question, for your step-sister died a short time ago.' On hearing these words Glénadel sprang to his feet like a captive set free. He was filled with joy and set out for his home, which he had not seen since his boyhood. Arrived there he saw his step-sister alive. He uttered a cry, and the terrible impulse instantly seized him again. That evening he had his brother to put him under restraint. 'Take a strong cord,' he said, 'and tie me up in the barn like a wolf, and send word to Dr. Calmeil.' The physician obtained for him admission to an asylum for the insane. On the eve of his admission he wrote to the director of the asylum: 'Sir, I am about to enter your establishment: I shall behave there as in my regiment. People will think I have recovered, and at times perhaps I shall feign recovery. You must not believe me, and I must never be permitted to leave under any pretext. When I beg to be allowed to go at large, redouble your vigilance, for the only use I shall make of that liberty will be to commit a crime I abhor.'"

It is not to be supposed that this case is unique or even a very uncommon one: in works on insanity we find recorded many instances of persons who, tormented by the impulse to kill those who are dear to them, take refuge in asylums, becoming voluntary prisoners.

The irresistible though conscious impulse to steal, to set fire to houses, to commit suicide by alcoholic excess, belongs to the same category.* Maudsley in his "Pathology of Mind" (Chapt. VIII.) presents so many examples that I cannot do

better than to refer to that work. I thus spare the reader useless repetition. For me it suffices to point out the enormous multitude of facts which justify the considerations I am about to offer.

It is to be remarked that the transition from the sane state to these pathological forms is almost imperceptible. Persons that are perfectly rational experience insane impulses, but these sudden and unwonted states of consciousness are without effect, do not pass into acts, being suppressed by opposite forces, by the dominant mental habit. Between this isolated psychic state and the states antagonistic to it there exists so great a disproportion that there is even no struggle between them. In other cases, usually regarded as of very little moment, "there is some eccentricity of behavior but nothing reprehensible or dangerous—simple oddity, capriciousness. Or again, a person is given to acts which though not seriously compromising are nevertheless mischievous—as destroying or beating an inanimate object, tearing one's clothing, etc. We have at the present time under observation a young woman who chews up all her gowns. Then there is the oft quoted case of the art amateur who, happening at a museum to see a valuable painting, felt an instinctive impulse to punch a hole through the canvas. Often-times these impulses go unnoticed, except by the consciousness of the one who experiences them."*

Sometimes fixed ideas of a character frivolous or unreasonable find lodgment in the mind which, though it deems them absurd, is powerless to prevent them from passing into acts. Many curious examples of this are to be found in a work by Westphal. A man, for instance, is haunted by the thought that perchance he might commit to writing that he has been guilty of some crime, and lose the paper. Accordingly he carefully preserves every bit of paper he finds, picks up paper on the streets to make sure that it contains no writing, takes it home and hoards it. He is fully conscious of the absurdity of the phantasy which worries him continually: he does not believe in it, nevertheless he is powerless to dismiss it.†

* Foville, *opus citatum*, p. 341.

† Westphal, "Ueber Zwangsvorstellungen," Berlin, 1877. We may add that the fear of doing an act sometimes leads one inevitably to do it. This we see illustrated in vertigo, when a person throws himself down in the street through fear of falling, when one wounds himself through fear lest he should wound himself, etc. These phenomena are explained by the nature of the mental representation, which by reason of its intensity passes into act

* See Trélat, "Folie Lucide;" Maudsley, "Crime and Insanity."

Between acts that are frivolous and those which are dangerous the difference is only quantitative: what the former exhibit to us foreshortened, the latter exhibit in enlarged proportions. We will try to explain the mechanism of this disorganization of the will.

In the normal state an end is chosen, approved, attained; that is to say the elements of the Ego, whether all or a majority of them, concur toward attaining it. Our states of consciousness—feelings and ideas, with their respective motor tendencies—and the movements of our members form a *consensus* that converges toward this end with more or less effort by means of a complex mechanism made up both of impulsions and inhibitions.

Such is the will in its perfect, typical form. But this is not a natural product; it is the result of art, of education, of experience. It is a structure that has been built up slowly, bit by bit. Observation both subjective and objective shows that each form of voluntary activity is the fruit of a conquest. Nature supplies only the raw material—in the physiological order a few simple movements, in the psychological order a few simple associations. To assist these simple and almost invariable adaptations, there must be formed other adaptations more and more complex and variable. For instance, the babe must acquire the power of using its legs, arms, and all the movable portions of its body, by means of experiment, combining the movements that are appropriate and suppressing those which are of no advantage. The simple groups so formed must be combined in complex groups, these into groups more complex still, and so on. A similar operation is necessary in the psychological order. What is complex is never won at the first effort.

But it is plain that in the edifice so built up little by little the original materials alone are stable, and that as complexity increases stability diminishes. The simplest actions are the most stable anatomically, because they are congenital, registered in the organism; and physiologically, because they are continually repeated in the experience of the individual, as also—if we take account of heredity, which opens up an illimitable field—in the innumerable experiences of the species and of all species.*

* The will-power being constituted when certain groups of movements obey certain states of consciousness, we may cite as a pathological case the fact mentioned by Meschede ("Correspondenzblatt," 1874) of a man who "found himself in this curious condition, that when he would do anything,

On the whole, the surprising thing is that the will, the complex and higher order of activity, should become predominant. The causes which raise it to that rank and hold it there are the same which in man raise and hold the intelligence above the sensations and the instincts: and taking humanity as a whole, facts prove the dominion of the one to be as precarious as that of the other. The great development of the mass of the brain in civilized man, and the influence of education and of the habits it produces, explain how it is that, in the face of so many adverse chances, rational activity so often retains the mastery.

The pathological facts that have been cited prove that the will is no entity reigning by right of birth, but a resultant that is always instable, always liable to break up, and in truth only a lucky accident. These facts—and they are innumerable—represent a state that may be regarded equally as a dislocation of the will and a retrograde form of activity.

If we study cases of irregular impulsions accompanied by full consciousness, we find that this subordination of tendencies—the will—is here broken in twain: for the *consensus* which alone constitutes the will is substituted a conflict between two groups of opposite and nearly equal tendencies, and hence it may truly be said that the will is dislocated.*

Considering the will not as a constituted whole but as the culminating point of an evolution, we must say that the lower forms of activity have the mastery and that the activity which is distinctively *human* retrogrades. We would observe however that the term "lower" has no moral implication here. One group is lower because it is evident that the activity which expends itself wholly in expressing a fixed idea or a blind impulse is by its nature restricted, adapted only to

whether of his own accord or at the instance of others, he, or rather his muscles, did just the contrary. If he would look to the right, his eyes turned to the left; and this anomaly extended to all his movements. It was simply a contra-direction of movement without any mental derangement, and it differed in this from involuntary movements, that he never produced a movement save when he willed it, though the movement was always the reverse of what he willed."

* We might show, were this the place, how fickle a thing is the unity of the Ego and how unreliable. In these cases of conflict which is the true Ego, that which acts or that which resists? If you decide in favor of neither, then there are two Egos. If you decide in favor of either, you must admit that the preferred group represents the Ego about as in politics the party that is slightly in the majority represents the state. But these questions cannot be discussed incidentally. I hope some day to devote a monograph to them.

the present and to a very small number of circumstances, while rational activity on the other hand transcends the present and is adapted to a great number of circumstances.

It must be admitted, though language does not lend itself readily to such a form of expression, that the will, like the intelligence, has its idiots and its geniuses, with all the degrees intermediate between these two. From this point of view the cases cited in the first group (impulses not attended by consciousness) would represent will-idiocy, or, in more precise language, will-dementia; the facts of the second group would exhibit a weakness of will analogous to weakness of intellect.

Pursuing our research, we must now pass to an analysis of the facts and must determine their causes. Is it possible to ascertain the conditions upon which this weakening of the higher activity depends? First of all we have to inquire whether the overthrow of the will is an effect of the predominance of the reflex actions, or whether on the contrary it is the cause of that predominance: in other words, whether the weakening of the will is the primary or the secondary fact. This question admits of no general answer. Observation shows that both propositions are true with respect to different cases, and consequently we can give only a special answer for a special case whose circumstances are fully known. No doubt oftentimes the irresistible impulse is the *origo mali*: it constitutes a permanent pathological state. There is then produced in the psychological order a phenomenon analogous to hypertrophy of an organ, or to the overproliferation of a tissue, as for example that which leads to the formation of certain forms of cancer. In both instances, whether the physiological or the psychological, this vicious development makes itself felt throughout the entire organism.

The cases wherein voluntary activity is affected directly and not as an indirect effect, are of most interest for us. What takes place in such cases? Is it the power of coördination or the power of inhibition that is affected, or both? An obscure point upon which only a conjecture may be offered. To obtain some light upon it, let us investigate two new groups of facts, viz., the artificial and momentary impairment of the will produced by intoxication; and the chronic impairment produced by lesion of the brain.

As every one knows, the intoxication caused by alcoholic liquors, by hashish,

by opium, after a first period of superexcitation brings about a notable impairment of the will. The individual is more or less conscious of this: other persons see it more distinctly. Soon—especially under the influence of alcohol—the impulses become excessive. The extravagances, violences and crimes committed in this state are innumerable. The mechanism of the onset of intoxication is subject of warm controversy. It is generally supposed that it begins with the brain, later acting upon the spinal cord and the medulla, and lastly upon the great sympathetic. There is produced an intellectual hebetude—that is to say, the states of consciousness are vague, indefinite, of little intensity: the physiopsychological activity of the brain is reduced. This decline of activity extends also to the motor power. Obersteiner has proved by experiments that under the influence of alcohol one reacts less promptly, though he imagines that the contrary is the fact.* It is not the ideation alone that is affected but also the ideomotor activity. At the same time the power of coördination becomes null or ephemeral and forceless. Now since coördination consists both in converging certain impulses toward an end and in directing impulses that are useless or antagonistic to that end, it follows from the fact that the reflex actions are excessive or violent in any case, that the power of inhibition—whatever may be its nature and mechanism—is impaired, and that its part in constituting and maintaining will-action is all-essential.

The pathology of the brain affords other confirmatory facts, all the more striking because they show a sudden and permanent change in the individual. Ferrier and other writers cite cases where lesion of the frontal convolutions, especially the first and second, led to almost total loss of will, and reduced the patient to automatism, or at least to that state wherein the instinctive activity reigns almost alone, without possibility of inhibition.

An infant was wounded by a knife in the frontal lobe. Seventeen years afterward his physical health was good, "but he was incapable of occupations that demanded mental exertion. He was irritable, especially when he drank intoxicating

* "Brain," Jan., 1879. A considerable number of experiments have been made with respect to this point, with uniform results. See Exner, in "Pflüger's Archiv," 1873; Dietl and Vintschgau, *ibidem* 1877; also an account of an important research made by Kræpelin in Wundt's psychophysiological laboratory, published in "Philosophische Studien," pp. 573 seqq.

liquor or when he was under any extraordinary excitement." A patient of Lepine's suffering from an abscess in the right frontal lobe "was in a state of hebetude. He seemed to understand what was said to him, but only with difficulty could he pronounce a word. On being bidden he would sit down; raise him from the chair and he could walk a few steps unassisted." A man who had received a violent blow which destroyed the greater part of the first and second frontal convolutions "lost all will-power. He understood what was said and acted as he was bid to act, but in an automatic, mechanical way."

Many similar cases are on record,* but the one which is most important for us is that of the "American carrier." A bar of iron shot from a mine passed through his skull, injuring only the præ-frontal region. He recovered and survived the accident twelve years and a half; but of the patient's mental state after recovery the following particulars are given: His employers, who before the accident regarded him as one of their best foremen, found him so changed that they could not restore him to his former position. The equilibrium, the balance between his intellectual faculties and his instinctive tendencies, seemed to have been destroyed. He had become nervous, disrespectful and grossly profane. He showed now but little politeness to his equals, was impatient of contradiction, and would listen to no advice that ran counter to his own ideas. At times he was exceedingly obstinate, though capricious and indecisive. He would make plans for the future, and forthwith reject them and adopt others. He was a child intellectually, a man in passions and instincts. Before the accident, though he had not received a school education, he had a well-balanced mind, and was regarded as a man of good natural ability, sagacious, energetic and persevering. In all these respects he was now so changed that his friends said they no longer recognized him.†

In this case we see the will impaired in proportion as the inferior activity becomes stronger. Furthermore we have here an *experiment*, for here is a sudden change brought about by an accident under clearly defined circumstances.

It is to be regretted that we have not many observations of this kind, for with their aid a great deal might be done

toward the interpretation of the diseases of the will. Unfortunately the researches so vigorously prosecuted with regard to localization of functions in the brain have had to do mostly with the motor and the sensorial regions, and these, as we know, occupy only a portion of the frontal region. So too there is need of a critical examination of the opposite class of facts, those namely which go to show that though the brain has suffered lesion, the will-power is apparently undiminished. This work accomplished, then Ferrier's theory that there exist in the frontal lobes centers of inhibition for the intellectual operations, would assume greater consistence and would supply a solid basis for the determination of the causes. As things stand, we may not attempt anything beyond conjectures.

When we compare the case of aboulia with that of the existence of irresistible impulses, we see that in the two cases will is in default owing to totally opposite conditions. In the one case the intelligence is intact, but impulsion is wanting; in the other, the power of coördination and of inhibition being absent, the impulse expends itself in purely automatic fashion.

CHAPTER IV.

IMPAIRMENT OF VOLUNTARY ATTENTION.

WE are now to study impairment of the will in a less striking form, namely, impairment of the power of *voluntary attention*. This does not in its essence differ from the impairments belonging to the group we have just been considering, since like them it consists in an impairment of the power of directing and of adaptation. It is a diminution of will-power in the strictest, straitest, and narrowest sense of the term, and it is indisputable even in the eyes of those who restrict themselves most obstinately to interior observation.

Before we turn our attention to acquired impairment, let us consider *congenital* impairment of voluntary attention. We will take no note of narrow or mediocre minds, in which feelings, intelligence and will are at one dead level of weakness. It is more interesting to study a great mind, some man gifted with high intelligence, with a quick sensibility, but who lacks the power of direction: thus we shall see a perfect contrast between thought and will. We have in Coleridge an instance of this.

* See Huxley's essay on "Animal Automatism." It will be published in No. 53 HUMBOLDT LIBRARY.
 † Ferrier, "Localization of Diseases of the Brain."

"There was probably no man of his time or perhaps of any time who surpassed Coleridge," says Dr. Carpenter,* "in the combination of the reasoning powers of the philosopher with the imagination of the poet and the inspiration of the seer; and there was perhaps not one of the last generation who has left so strong an impress of himself in the subsequent course of thought of reflective minds engaged in the highest subjects of human contemplation. And yet there was probably never a man endowed with such remarkable gifts who accomplished so little that was worthy of them, the great defect of his character being the want of Will to turn his gifts to account; so that with numerous gigantic projects constantly floating in his mind, he never brought himself even seriously to attempt to execute any of them. It used to be said of him that whenever either natural obligation or voluntary undertaking made it his *duty* to do anything, the fact seemed a sufficient reason for his not doing it. Thus at the very outset of his career, when he had found a bookseller generous enough to promise him thirty guineas for poems which he recited to him, and might have received the whole sum immediately on delivering the manuscript, he went on week after week begging and borrowing for his daily needs in the most humiliating manner, until he had drawn from his patron the whole of the promised purchase money, without supplying him with a line of that poetry which he had only to *write down* to free himself from obligation. The habit of recourse to nervine stimulants (alcohol and opium) which he early formed and from which he never seemed able to free himself doubtless still further weakened his power of volitional self-control, so that it became necessary for his welfare that he should yield himself to the control of others.

"The composition of the poetical fragment 'Kubla Khan' in his sleep, as told in his 'Biographia Litteraria,' is a typical example of automatic mental action. He fell asleep whilst reading the passage in 'Purchas's Pilgrimage' in which the 'stately pleasure house' is mentioned, and on awaking he felt as if he had composed from two to three hundred lines, which he had nothing to do but to write down, 'the images rising up as things, with a parallel production of the correspondent expressions, without any sensation or consciousness of effort.' The whole of this singular fragment as it stands, consisting of fifty-four lines, was written as fast as his pen could trace the words; but having been interrupted by a person on business who stayed with him above an hour, he found to his surprise and mortification that 'though he still retained some vague and dim recollection of the general purport of the vision, yet with the exception of some eight or ten scattered lines and images, all the rest had passed away like the images on the surface of a stream into which a stone has been cast,

but, alas! without the after-restoration of the latter."

Dr. Carpenter then quotes the description of Coleridge given in Chapter VII. of Carlyle's "Life of John Sterling":

"Coleridge's whole figure and air, good and amiable, otherwise, might be called flabby and irresolute, expressive of weakness under possibility of strength. He hung loosely on his limbs, with knees bent and stooping attitude. In walking he rather shuffled than decisively stepped; and a lady once remarked he never could fix which side of the garden walk would suit him best, but continually shifted in corkscrew fashion and kept trying both.

"Nothing could be more copious than his talk; and furthermore it was always virtually or literally of the nature of a monologue; suffering no interruption however reverent: hastily putting aside all foreign additions, annotations or most ingenious desires for elucidation as well-meant superfluities which would never do. Besides it was talk not flowing any whither like a river, but spreading everywhither in inextricable currents and regurgitations like a lake or sea; terribly deficient in definite goal or aim, nay, often in logical intelligibility; *what* you were to believe or do on any earthly or heavenly thing, obstinately refusing to appear from it. So that most times you felt logically lost, swamped, near to drowning in this tide of ingenious vocables spreading out boundless as if to submerge the world.

"He began anywhere. You put some question to him, made some suggestive observation; instead of answering this or decidedly setting out toward answering it, he would accumulate formidable apparatus, logical swim-bladders, transcendental life-preservers and other precautionary and vehicular gear for setting out; perhaps did at last get under way, but was swiftly solicited, turned aside by the glance of some radiant new game on this side or that into new courses and ever into new, and before long into all the universe, where it was uncertain what game you would catch or whether any. His talk, alas! was distinguished like himself by irresolution: it disliked to be troubled with conditions, abstinences, definite fulfillments; loved to wander at its own sweet will and make its auditor and his claims and humble wishes a mere passive bucket for itself.

"Glorious islets too, balmy, sunny islets of the blest and the intelligible I have seen rise out of the haze, but they were few and soon swallowed in the general element again.

"Eloquent, artistically expressive words you always had; piercing radiances of a most subtle insight came at intervals; tones of noble pious sympathy, recognizable as pious though strangely colored, were never wanting long; but in general you could not call this aimless, cloud-rapt, cloud-based,

* "Mental Physiology," pp. 266-7.

lawlessly meandering human discourse of reason by the name of 'excellent talk,' but only of 'surprising,' and were bitterly reminded of Hazlitt's account of it: 'Excellent talker, very—if you let him start from no premises and come to no conclusion.'"

We now turn to familiar instances of *acquired* impairment of voluntary attention. It occurs in two forms. The first is characterized by excessive intellectual activity, superabundance of states of consciousness and abnormal production of feelings and ideas in a given time, as we have seen when speaking of alcoholic intoxication. This exuberance of cerebral activity is more noticeable still in the more intellectual intoxication produced by hashish* and opium. The individual feels himself to be overwhelmed by the irresistible tide of his ideas, and language is too slow to render the rapidity of his thoughts; but at the same time the power of directing the course of his ideas becomes weaker and weaker, and the lucid moments shorter and shorter.* This state of psychic exuberance, whatever its cause,—fever, cerebral anæmia, emotion—always has the same result.

Between this state and attention there is a perfect antagonism: one excludes the other. We have here in fact only a special case of excessive reflex action, only that here we have to do with psychic reflex action. In other words all states of consciousness tend to expend themselves, and this they can do only in two ways, either by producing a movement, an act; or by calling forth other states of consciousness, according to the law of association. The latter process is a case of reflex action of a complex kind—psychic reflex action—but like physiological reflex action it is only a form of automatism.

The second form brings us back to the type of aboulia. It consists in a progressive diminution of the directive power and eventual impossibility of intellectual effort.

"In the incipient stage of disease of the brain," says Forbes Winslow,† "the patient complains of an incapacity to control and direct the faculty of attention. He finds he cannot without an obvious and painful effort accomplish his usual mental work, read or master the contents of a letter, newspaper or even a page or two of a favorite book. The ideas become restive and the mind lapses into a flighty condition, exhibiting no capacity for continuity of thought.

"Fully recognizing his impaired and failing energies, the patient repeatedly tries to conquer the defect, and seizing hold of a book, is resolved not to succumb to his sensations of intellectual incapacity, physical languor and cerebral weakness; but he often discovers (when it is too late to grapple with the mischief) that he has lost all power of healthy mental steadiness, normal concentration, or coördination of thought. In his attempt to comprehend the meaning of the immediate subject under contemplation, he reads and re-reads with a determined resolution, and apparently unflagging energy, certain striking passages and pages of a particular book, but without being able to grasp the simplest chain of thought, or follow successfully an elementary process of reasoning; neither is he in a condition of mind fitting him to comprehend or retain for many consecutive seconds the outline of an interesting story, understand a simple calculation of figures or narrative of facts. The attempt, particularly if it be a sustained one, to master and converge the attention to the subject which he is trying to seize, very frequently increases the pre-existing confusion of mind, producing eventually physical sensations of brain lassitude and headache."

Many general paralytics, after passing through the period of intellectual over-activity—the period of gigantic projects, of immoderate purchases, of purposeless voyages, of incessant loquacity, during which the will is dominated by the reflex actions, reach later the period when it is impotent from atonicity: effort persists but for a moment, till at last this ever increasing passivity ends in dementia.*

The reader sees without any commentary that the diseases of voluntary attention are reducible to the types already considered. It will be best therefore without citing any further instances to inquire what instruction may be derived from that state of the mind called attention, as to the nature of the will, and what suggestions bearing upon the present research. For this purpose it is not necessary that we make a study of attention, however interesting, however ill-understood that subject may be. The question

* Of this class of patients some, but they are few pass through a period of struggle which shows wherein the will is master and how it eventually succumbs. "I have seen at Bicêtre," says Billod, "a general paralytic whose *délire des grandeurs* was of the most ultra type, escape from the establishment and go barefoot through a driving rain storm and in the middle of the night from Bicêtre to Batignolles. The patient remained outside for a whole year, during which he struggled with all his will against his intellectual delirium, knowing well that should he betray the first symptom of insanity, he would be sent back to Bicêtre. He came back nevertheless. I have met with several other instances of soundness of will persisting for a considerable time in general paralytics."

* Moreau, "Du Hashish et de l'Aliénation Mentale," p. 60; Richet, "Les Poisons de l'Intelligence," p. 71.

† "On Some Obscure Diseases of the Brain and Mind," chap. xii.

can be considered here only in part, that is so far as it concerns the will. I shall restrict my conclusions upon this point to the following propositions:

1. Voluntary attention, which is commonly credited with marvelous feats, is only an imitation, artificial, instable and precarious, of spontaneous attention.

2. The latter alone is natural and effective.

3. It depends, as regards its origin and its permanence, upon certain affective states, upon the presence of agreeable or disagreeable *feelings*: in a word it is sensitive in its origin, and hence allied to the reflex actions.

4. The inhibiting action appears to play an important but as yet indefinable part in the mechanism of attention.

To establish these propositions it is well first to examine spontaneous attention, considering it in all its different forms. The crouching animal watching its prey; the child intently gazing at a commonplace spectacle; the assassin awaiting his victim in a nook of a wood—here the mental image takes the place of the real object; the poet contemplating an inward vision; the mathematician studying out the solution of a problem:* all present essentially the same interior and exterior characters.

With Sergi I define the state of intense spontaneous attention to be a differentiation of perception producing greater psychic energy in some of the nerve centers, and a sort of temporary catalepsy in other centers.† But I have not to study attention in itself, only to determine its origin, its cause.

Plainly in the states above enumerated and in their analogues, the true cause is an affective state, a feeling of pleasure, love, hate, curiosity: in short a state more or less complex, agreeable, disagreeable or mixed. Because the prey, the spectacle, the thought of the victim, the problem to be solved produce in the animal, the child, the assassin, the mathematician, an emotion that is intense and sufficiently durable, they are attentive. Eliminate emotion, and all is gone: but while emotion lasts, so does attention. The *modus operandi* is as in those reflex actions which seem to be continuous, because an excitation that is incessantly repeated and which

is ever the same keeps them up till nervous exhaustion is produced.

Is a counter proof required? Observe the incapacity for protracted attention of children, women, and in general those of inferior mental force. The reason is that objects awaken in them only superficial, instable feelings, and they are quite inattentive to high, complex, profound questions, for these do not touch their emotions. On the other hand they are attentive to trifles, for these interest them. I might add that the orator and the writer hold the attention of their public by addressing their feelings. Look at the matter from whatever side, and the same conclusion is inevitable; nor would I dwell upon so evident a fact were it not that the authors who have studied the subject of attention seem to have forgotten this all-important influence.

Spontaneous attention gives a maximum effect with a minimum of effort, while voluntary attention gives a minimum effect with a maximum of effort, and the contrast between the two is sharper in proportion as the one is more spontaneous and the other more voluntary. Voluntary attention in its highest degree is an artificial state in which with the aid of factitious emotion we keep up certain states of consciousness that are ever tending to die out—for instance when for politeness[‡] sake we carry on a wearisome conversation. In the case of spontaneous attention it is our own individuality that produces this specialization of consciousness; in voluntary attention it is an exceedingly limited portion of our individuality. Many questions suggest themselves here, but as I have already said, I have only to study attention in itself. I had simply to show—and this point I hope is beyond controversy—that attention is by its origin of the nature of reflex action; that under the form of spontaneous attention it possesses the regularity of the reflex actions and their potency of action; but that in both cases it is a sensitive excitation that causes it, keeps it up, and measures its intensity.

Again we see that the voluntary rests upon the involuntary and derives from it all its force, and that, compared with the latter, it is very precarious. Education of the power of attention consists in the last resort simply in calling out and developing these factitious emotions, and in striving to make them stable by repetition; but as there is no creation *ex nihilo*, they must have some basis however weak in nature. To conclude as regards this point, I confess that for my part I accept the paradox

* Of course we speak of poets and mathematicians that are such by nature, not by education.

† Sergi, "Teoria Fisiologica della Percezione." See also Lewes, "Problems of Life and Mind," Third Series; Maudsley, "Physiology of Mind," Wundt, "Grundzüge der Physiologischen Psychologie;" Ferrier, "The Functions of the Brain."

of Helvetius so often disputed, that "all intellectual differences between one man and another spring only from attention," with the proviso that attention here be taken to mean spontaneous attention alone: but then the dictum amounts only to this, that the differences between men are innate and natural.

Having shown how attention is produced, we have next to inquire how it is kept up. The difficulty is with voluntary attention only, for, as we have seen, spontaneous attention explains itself. It is continuous because the excitation which causes it is continuous. On the other hand, the more voluntary it is, the more effort does attention require, and the more instable is it. The two cases are in effect a struggle between states of consciousness. In the first case (spontaneous attention) a state of consciousness—or rather a group of states of consciousness—possesses such intensity that no struggle against it is possible, and it assumes the mastery by sheer force. In the second case (voluntary attention) the group of states of consciousness is not of sufficient intensity to dominate competing states, and it gets the upper hand only by the aid of an additional force, namely, by the intervention of the will.

By what mechanism does attention act? Apparently by an inhibition of movements. Thus we are brought back to the problem of inhibition, more involved in obscurity here than anywhere else. Let us see what is to be learned upon this point. In the first place it is hardly necessary to repeat that the brain is a motor organ, that is to say that many of its elements have for their function to produce motion, and that there is hardly a single state of consciousness which does not contain in some degree motor elements. It follows that every state of attention implies the existence of these elements. "In movements of the limbs and trunk the feelings of operation are very conspicuous; they are less so in the delicate adjustments of the eye, ear, etc., and are only inductively recognizable in the still more delicate adjustments of attention and comprehension, which are also acts of the mind in more than a metaphorical sense. . . . The purest intellectual combinations involve motor impulses (feelings of operation) quite as necessarily as the combination of muscles in manipulation. The feelings of effort and relief in seeking and finding our way through an obscure and tangled mass of ideas—the tentatives of hypothesis and induction—are but fainter forms of the feelings in

seeking and finding our way along a dark road or thick forest, checked by failure and enlightened by every successful step."*

Again every state of consciousness, particularly when it is highly intense, tends to pass into movements; and so soon as it enters its motor phase, it loses its intensity, it is in decline, it tends to disappear out of the consciousness. But a state of consciousness has another way of expending itself: it may transmit its tension to other states through the mechanism of association—an expenditure inward, if you please, in lieu of an expenditure outward. But association does not proceed in one fashion only. In spontaneous attention certain associations gain the mastery themselves alone, and by themselves alone, in virtue of their own intensity. In voluntary attention—which reflection is the highest form—we are conscious of a radiation in different directions; and in cases where we have much difficulty in being attentive, the associations which have the upper hand are those which we do not wish, that is to say those which are not chosen, not affirmed as the ones that ought to be kept up.

By what means then are the weaker associations maintained? In order to get as clear an idea as may be of the process, let us consider some analogous phenomena, though of a less abstruse kind. A man is learning to play a musical instrument, or to handle a tool, or better still, a child is learning to write. At first he makes many movements that are quite useless: he keeps moving his tongue, his head, his legs, and only by degrees does he learn to hold his members in subjection, and to confine himself to the required movements of the hands and the eyes.

In voluntary attention the process is similar. The associations which go out in all directions may be likened to these useless motions. The problem in both cases is to substitute a limited for an unlimited association. For this purpose, we eliminate all associations not helpful to the end we have in view. Properly speaking, we do not suppress states of consciousness, but we do prevent their surviving to call forth like states and to increase and multiply at pleasure. As every one knows the attempt to do this often fails and is always laborious, and while we check divagation, the available nerve force is economized to our advantage, for

* G. H. Lewes, "Problems of Life and Mind," 3d Series cont'd, page 397.

to lessen purposeless diffusion is to increase useful concentration.

Such is the idea we may form of this obscure phenomenon when we strive to get at its mechanism, instead of having recourse to any supposed "faculty" of attention, which explains nothing. Still we must admit with Ferrier that "on what physiological basis this psychological faculty rests is an extremely difficult question, and is one scarcely capable of experimental determination."* We would add that the foregoing remarks do not pretend to be an explication, but only an approximation.

CHAPTER V.

THE REALM OF CAPRICE.

To will is to choose in order to act: such is for us the formula of normal will. The anomalies so far considered may be classed in two great groups: in one impulsion is absent, and no tendency to act appears (aboulia); in the other a too rapid or too intense impulsion prevents the act of choice. Before we consider instances of extinction of the will, where there is neither choice nor acts, let us study a type of character in which either the will is not formed at all or at best exists only in an extremely instable and inefficient form. The best instance of this is seen in the hysterical constitution. Properly speaking we find here rather a constitutional state than a mere derangement. A simple irresistible impulse is like an acute disease; permanent and invincible impulses are like a chronic malady; but the hysterical character is a diathesis. It is a state in which the conditions of volition are nearly always lacking. From the description recently given by Dr. Huchard of the characters of hysterical subjects I take the following particulars bearing upon our subject:

"One prominent trait of their character is mobility. From day to day, from hour to hour, from minute to minute they pass with incredible rapidity from joy to sadness, from laughter to tears. Changeable, freakish or capricious, at one moment they talk with amazing loquacity, but the next they are gloomy and taciturn, have not a word to say, being lost in reverie or plunged in profound depression. Then they are possessed by a vague indefinable feeling of sadness ac-

* "Functions of the Brain." The two paragraphs devoted to this question will be read with profit.

companied by a choking sensation and oppression in the epigastric region. They have fits of sobbing, and seek to hide their tears in solitude; again on the other hand they have outbursts of immoderate laughter, without sufficient cause. 'They behave,' says Ch. Richet, 'like children who oftentimes can be made to laugh heartily, while their cheeks are still wet with the tears they have shed.'

"Their character changes like the views of a kaleidoscope, a fact which led Sydenham justly to remark that inconstancy is their most constant trait. Yesterday they were joyous, amiable, gracious: to-day they are ill-humored, touchy, irascible, vexed by every trifle, testy and snappish, dissatisfied with everything; nothing interests them, they are tired of life. They conceive a strong antipathy to-day toward the person they esteemed and loved yesterday, or *vice versa*, and they are as zealous to hate certain persons now as before they were eager to show them every mark of affection.

"Sometimes their sensibility is aroused by a most trivial cause, while the profounder emotions scarcely touch it: they are indifferent, unmoved by the recital of a real sorrow, while they shed abundant tears and give themselves up to despair on account of some harmless speech that they misinterpret, or some trivial pleasantry that they transform into an affront. This *moral ataxy* is exhibited even with regard to their nearest interests. One hysterical subject will be entirely indifferent about the conduct of her husband; another will be heedless of the danger that threatens her fortunes. By turns they are gentle or violent, says Moreau of Tours, kind or cruel; impressionable to excess; rarely master of the first movement of passion; incapable of resisting impulses of the most opposite kinds; they show a lack of equilibrium between the higher moral faculties—will, conscience,—and the lower faculties—instincts, passions and desires.

"This extreme mobility in their state of mind and their affectional disposition, this instability of character, this want of fixedness, this absence of stability in their ideas and volitions, explains their incapacity to keep the attention long fixed upon a book, a study or a task of any kind whatever.

"All these change: take place with great rapidity. In hysterical subjects the impulses are not altogether free from control by the intelligence, as they are in epileptics, but they are quickly followed by acts. This is the explanation of those sudden movements of anger and indignation, those outbursts of enthusiasm, those fits of desperation; the mad gayer, the sudden affectionateness or the equally sudden transports of wrath during which they stamp the floor like spoiled children, break the furniture, and so on.

"Hysterical women are governed by the passions. Nearly all the different phases of their character, of their mental state, may be summed up in these words: they know not how to will, they cannot will, they will not will. Just because their will is ever waver-

ing and tottering; because it is ever in a state of instable equilibrium; because it turns like the weather, *vana*, to the slightest gust: for all these reasons do hysterical subjects show such variability, such inconstancy in their desires, their ideas and their affections."*

Having reproduced this faithful portrait we may abridge our comments. The reader has here placed before his eyes this state of incoördination, of broken equilibrium, of anarchy and of "moral ataxy;" but it still remains for us to justify the assertion made at the beginning of this chapter, that we see here a constitutional impotence of will; that the will cannot exist here because the conditions of its existence are wanting. For clearness' sake, I will anticipate what will be established by proofs and in fuller detail when I sum up the conclusions of the work.

If we take an adult person endowed with an average will, we find that his activity (that is to say his power to produce acts) is of three degrees. In the lowest degree are automatic acts, simple or composite reflex actions, habits; next above these come the acts produced by the feelings, the emotions and the passions; highest of all the acts dictated by reason. These last presuppose the other two, rest upon them and consequently depend upon them, though they give to them coördination and unity. Capricious characters, of which the hysterical character is the type, possess only the two lower forms; the third is as it were atrophied. Therational activity is by nature, the very rare exceptions apart, always the weakest. It becomes predominant only on condition that the ideas in the mind call into action certain feelings that are far more apt than ideas to pass into acts. As we have seen, the more abstract an idea, the weaker is its motor tendency. In subjects of hysteria the regulative ideas either do not come into being at all, or they remain simply theoretic concepts. It is because certain ideas, as those of utility, convenience, duty and the like remain in this state of theoretic conceptions, that they are not *felt* by the individual, that they produce in him no affectional reverberation, so to speak, that they do not enter into his moral fiber but remain as it were a foreign element: hence they are without action; hence they are practically as though they did not exist.

The individual's power of acting is maimed and imperfect. The tendency of the feelings and passions to pass into acts is doubly strong, both in itself and because there is nothing above it to hamper it or to be a counterpoise to it. And as it is the characteristic of the feelings as of the reflex actions to go straight to their object, and to have an adaptation in one direction only—unilateral, whereas rational adaptation is multilateral,—the desires, rapidly conceived and immediately satisfied, leave the ground free for other desires whether like or opposite, according to the ever changing whims of the individual. There is nothing but caprice, or at most velleity, the merest simulacrum of volition.

Still the fact that desire proceeds only in one direction and tends to expend itself unchecked, does not explain the instability of the hysteric character nor its lack of will. If a desire that is ever satisfied is ever recurring, there is stability. The predominance of the affectional life does not of necessity preclude will: indeed a passion intense, stable, consented to is the very basis of an energetic will. Such passion we find in men of great ambition—in the martyr whose faith is not to be shaken; in the redskin who in the midst of his tortures defies his enemies. We must search deeper therefore for the cause of the instability found in the hysteric character; and this cause cannot be anything else but a state of the individuality, that is, in the last resort, of the organism. We say that will is strong whose aim, whatever it be, is fixed. If circumstances change, means are changed: adaptations are successively made, in view of new environments; but the center toward which all converges does not change. Its stability expresses the permanency of character in the individual. If the same end is ever chosen, approved, the reason is that the individual continues to be the same. But suppose an organism with instable functions, whose unity—which is simply a *consensus*—is ever in process of dissolution and reconstitution upon a new plan according to the sudden variations of the functions that make it up: clearly in such a case choice can hardly exist and cannot be enduring: there are only velleities and caprices. This is what takes place in subjects of hysteria. The instability is a fact: its cause is very probably to be found in functional disorders. Anæsthesia of the special senses or of the general sensibility, hyperæsthesia, derangement of the motor apparatus, contraction of muscles, convul-

* Axenfeld et Huchard, "Traité des Nevroses," 2d edition, 1883, pp. 958-971.

sions, paralysis, derangement of the vasomotor, secretory and other functions—all of these causes occurring successively or simultaneously, keep the organism constantly in a state of instable equilibrium; and the character, which is only the psychic expression of the organism, varies in the same degree. For a stable character to rest upon so wavering a base were a miracle. Here therefore we see the true cause of the impotence of will, and this impotence is, as we have said, constitutional.

Certain facts, while they seem to conflict with this theory, only give confirmation to it. Hysterical patients are sometimes possessed by a *fixed* idea, of which it is impossible to disabuse them. One refuses to eat, another to speak, a third to use her eyes, on the ground that the work of digestion or the exercise of the vocal or the visual organs would, as they imagine, cause them pain. More frequently we find the species of paralysis known as "psychic" or "ideal." The patient remains abed for weeks, months or even years, in the belief that she is unable to stand or to walk. Some moral shock, or simply the influence of some one who possesses her confidence, or who acts with authority effects a cure. One betakes herself to her feet at the alarm of fire; another rises from her bed and goes to meet her long-absent brother; a third decides to partake of food out of fear of her physician. Briquet, in his "*Traité de l'Hystérie*," mentions several cases of women whom he cured by inspiring them with faith in their recovery. We might quote many of those so-called miraculous cures which have amused the curiosity of the public from the time of the deacon Pâris to our own day.

The physiological causes of this sort of paralysis are subject of keen disputation. Looking at it from the psychological point of view, we recognize the existence of a fixed idea the result of which is an inhibition. Now since an idea does not exist of itself, nor without certain cerebral conditions, and since it is only a part of a psychophysiological whole—the conscious part—it must correspond to an abnormal state of the organism, of the motor centers perhaps, and thence it must have its origin. However that may be, there is no "exaltation" of the will, as some physicians have stoutly contended: on the contrary there is absence of will. We come again upon a morbid type that we have already studied, differing from that only in form: it is inhibitory. But there

is no reaction springing direct from the individual, against the fixed idea. It is an influence from without that interposes and produces an opposite state of consciousness, with the concomitant feelings and physiological states. The result of this is a strong impulsion to act, which suppresses and takes the place of the state of inhibition: but it is hardly a volition: at best it is a volition produced with the assistance of others.

The conclusion to which we are led by these phenomena is, again, that the conditions of will are wanting, and will cannot exist.

CHAPTER VI.

EXTINCTION OF THE WILL.

THE cases of extinction of the will, which we are now to study, are those in which there is neither choice nor action. When the whole psychic activity is, or seems to be completely suspended, as in deep sleep, in artificial anæsthesia, in coma and similar states, there is a return to the vegetative life. Of this we will not treat: the will disappears because all psychic life disappears. We have to do here with cases where one form of mental activity continues, though there remains no possibility of choice followed by act. This extinction of the will is seen in ecstasy and in somnambulism.

Authors distinguish divers kinds of ecstasy—as mystic, morbid, physiological, cataleptic, somnambolic, and so forth. These distinctions are of no consequence here, for at bottom the mental state is the same in all the forms. Most ecstasists reach the ecstatic condition naturally, in virtue of their physical constitution; but others assist nature by artificial processes. The religious and philosophical literature of the Orient, India particularly, abounds in writings from which it has been possible to compile a sort of working manual showing how to bring about ecstasy. To stand motionless; to gaze fixedly at the sky, or a luminous object, on the tip of the nose, or on one's navel (after the manner of the monks of Mt. Athos hence called *Omphalopsychi*); to repeat continually the monosyllable OM (Brahm) contemplating the while the supreme being; to "hold in the breath," *i.e.* to retard respiration; "to have no heed of time or place:" such are the acts which "cause one to be like

unto the placid light of a lamp set in a place where the wind blows not.*

Having attained this state the ecstasist presents certain physical characters: now he is motionless and mute; anon he interprets the vision that holds him entranced, by speech and song and gesture. Seldom does he quit the spot where he stands. His physiognomy is expressive, but his eyes though open see not. Sounds no longer reach his sense, save in some cases the voice of a particular person. The general sensibility is gone: he feels no contact: neither pricking nor burning causes pain.

What he feels inwardly the ecstasist alone may tell, and were it not that at waking he retains a very distinct recollection of it, the profane would have to rely on inductions. The speeches and the writings of ecstasists show striking uniformity amid differences of race, of belief, of mental constitution, of time and of place. Their mental state is reduced to one image-idea standing either isolated or as the center of a single group which engrosses the entire consciousness and maintains itself there with extreme intensity. Many mystics have described this state with great precision, and above all St. Theresa. I take a few passages from her autobiography in order thus to place before the reader an authentic description of ecstasy.

In communion with God there are four degrees of "prayer," which she compares to four ways of watering a garden, "the first by drawing the water by main force out of a well: this is sheer hard work; the second, by drawing it by means of a *noria* (Persian wheel)—in this way one obtains more water with less fatigue; the third, by conducting the water from some river or brook; the fourth and incomparably the easiest is an abundant fall of rain, God himself undertaking to water the garden without the slightest fatigue on our part."

* "Bhagavad Gita," VI. The Buddhist teachers say that there are four degrees in the contemplation which leads to the earthly *nirvāna*. The first degree is the inward feeling of happiness which springs up in the soul of the ascetic when he declares himself to have at length come to distinguish the nature of things. The *yoghi* is then detached from all other desire save the *nirvāna*: he still exercises judgment and reason; his intelligence is all centered on the *nirvāna*, and feels only the pleasure of inner satisfaction, without judging of it, without even understanding it.

In the third degree, the pleasure of satisfaction is gone, and the sage is indifferent about the felicity which his intelligence still experiences. The sole pleasure that remains for him is a vague sense of physical well-being, obscure and all as it is; he has also lost all memory; he has lost even the sense of his indifference. Free of all pleasure and of all pain, he has attained impossibility: he is as near to *nirvāna* as he can be in this life. (Barth. Saint-Hilaire, "Le Bouddha et sa Religion," pp. 136, 137.)

In the first two degrees there are as yet only the rudiments of ecstasy, as she observes in passing: "Sometimes while reading I would suddenly experience a sense of the presence of God. It is utterly impossible for me to doubt that he was within me or that I was quite lost in him. This was not a Vision. . . It suspends the soul in such a way that it seems to be quite outside of itself. The will loves, the memory to me appears almost lost, the understanding acts not at all, yet it is not lost." In a higher degree which is "neither a ravishment nor a spiritual sleep," "the will alone acts and, not knowing how it is made captive, gives simply to God its consent, that he may imprison it, in the assurance that it becomes the thrall of him whom it loves. . . . The understanding and memory come to the assistance of the will, to the end it may become more and more capable of enjoying so great a good. Sometimes however their aid serves only to disturb the will, in this close union with God. But then the will, not suffering itself to be disturbed by their importunity, must cleave to the delights and to the profound calm which it is enjoying. The attempt to exercise these other two powers [faculties] would lead the will astray with them. They are then like doves which, dissatisfied with the food provided for them by their master without any exertion on their part, go in search of other food, but which, after seeking in vain, make haste to return to the dove-cote." In this degree "I look on it as a great advantage, when writing, to find myself in the prayer of which I am speaking, for I then see clearly that neither the expression nor the thought comes from me; and after it has been written, I cannot understand how I could ever have done it: this happens to me often."

In the third degree we have the ecstasy:

"This state is a sleep of the powers [faculties] wherein, though not altogether lost in God, they nevertheless know not how they operate. . . . It is as though one who longs for death were already holding in his hand the blessed candle, and had but to draw one breath more to attain the fulfillment of his longings. It is for the soul an agony full of inexpressible delights, wherein it feels itself dying almost entirely to all the things of the world, and reposes with rapture in the enjoyment of its God. No other terms do I find to portray or to explain what I experience. In this state the soul knows not what to do: knows not whether it is speaking or is silent: whether it laughs or weeps: it is a glorious delirium, a heavenly madness, a supremely delicious mode of enjoyment. . . . And while it

thus searches for its God, the soul feels with a very lively and a very sweet pleasure that it is fainting almost quite away: it falls into a sort of swoon which little by little deprives the body of respiration and of all its strength. It is unable without a very laborious effort to make the slightest movement of the hands. The eyes close without any purpose of the soul to shut them; and if it keeps them open it sees almost nothing. It is incapable of reading, even if it would; it sees indeed the letters, but can neither distinguish them nor assemble them. When spoken to it hears the sound of the speaker's voice, but no distinct words. So too it receives no service of its senses. . . . All its outer strength departs: conscious that thereby its own strength is increased, it can the better enjoy its glorious privilege. . . . In truth, if I am to judge from my own experience, this 'prayer' is at first of so brief duration as not to reveal itself in so manifest a way by external signs and the suspension of the senses. It is to be observed, at least in my opinion, that this suspension of all the powers never lasts long: the suspension is a protracted one that lasts half an hour, and I do not think with me it ever lasted so long. Still it must be confessed that it is difficult to judge of this matter, seeing that one is at the time deprived of feeling. I would simply call attention to one point, namely that whenever this general suspension occurs hardly any time elapses before some one or other of the powers [faculties] comes to itself. The will is the faculty which persists best in the divine union, but the other two soon begin to importune it. As it is in serenity, it brings them back and suspends them again; thus they remain tranquil for a moment, and then resume their natural life. With these alternations the prayer may continue and does in fact continue for some hours. . . . But that state of perfect ecstasy in which the imagination does not wander to any external object is, I repeat, of short duration. I would add that as the powers come to themselves only imperfectly, they may remain in a sort of delirium for some hours, during which God from time to time enraptures them anew and fixes them in himself. . . . What occurs in this secret union is so hidden that it is impossible to speak of it more clearly. The soul then sees itself to be so near to God, and so strong is its certitude touching that fact, that it cannot have the slightest doubt that it enjoys such a favor, all its powers lose their natural activity: they have no knowledge of their operations. . . . Thus the butterfly, memory, sees its wings scorched here, and it no longer can flit hither and thither. The will no doubt is occupied with loving, but it understands not how it loves. As for the understanding, if it understands at all it does so in a way that remains unknown to itself, nor can it comprehend aught of what it understands.*

I will not follow St. Theresa in her description of "rapture"—"that divine eagle which with sudden impetuosity seizes you and carries you off." These extracts suffice, and whoever reads them attentively will not hesitate to attribute to them all the value of a good psychological observation.*

On examining the detailed narratives of other ecstasists, which I cannot present here, I find that ecstasy may be conveniently for the purpose of our work divided into two classes. In the first motor power persists in a certain degree. The ecstasist follows the several phases of the Passion, the Nativity or some other religious drama, reproducing it with appropriate movements. There is a series of highly intense images with one invariable order of succession, being repeated again and again with perfect automatism. Marie von Moerl and Louise Lateau are well known instances.

The other class is that of ecstasy in repose. Here the idea alone reigns, commonly an abstract or metaphysical idea: in the case of St. Theresa and Plotinus it is the idea of God; for Buddhists it is *Nirvāna*. All movements are repressed: there is felt only "a residuum of inward agitation." Observe in passing how all this agrees with what has already been said, that with abstract ideas the tendency to movement is at the minimum, and that these ideas being representations of representations—pure schematisms—the motor element grows weaker in the same degree as the representative element.

But in both cases the mental state of ecstasy is a complete reversal of the laws of the normal mechanism of consciousness. Consciousness exists only on the condition of perpetual change: it is essentially discontinuous. An homogeneous and continuous consciousness is an impossibility. Ecstasy fulfills the conditions of

* St. Theresa thus describes her physical state during her "raptures": "Oftentimes my body would become so light that it no longer possessed any weight—sometimes I no longer felt my feet touching the ground. While the body is in rapture it remains as though it were dead, and often is absolutely powerless to act. It retains whatever attitude it may have assumed at the moment of the access; thus it continues standing or seated, the hands open or closed, in a word it continues in the state wherein the rapture found it. Though commonly a person does not lose feeling, still it has happened to me to be entirely deprived of it. This has occurred very rarely and it has lasted only for a very short time. Most frequently feeling remains; but a person experiences an indefinite disturbance; and though it is impossible to perform any external act, one still can hear a sort of confused sounds coming from a distance. And even this kind of hearing ceases when the rapture is in the highest degree."

* "Vie de Sainte Thérèse écrite par elle-même." Compare Plotinus, "Enneades," VI.; Tauler, "Institutio Christiana."

such consciousness in the highest degree possible, but as St. Theresa remarks, either consciousness disappears, or the understanding and the memory—that is discontinuity—come back at intervals bringing consciousness back with them.

This psychological anomaly is complicated with another. All states of consciousness tend to expend themselves in proportion to their intensity. In the highest ecstasy the expenditure is naught, and it is owing to the absence of the motor phase that the intellectual intensity is maintained. The brain, which is in the normal state an organ at once intellective and motor, ceases to be a motor organ. Furthermore, in the intellectual order the heterogeneous and manifold states of consciousness which constitute the ordinary staple of life have disappeared. The sensations are suppressed, and with them the associations they call out. One single representation absorbs everything. If we compare the normal psychic activity to circulating capital that is continually modified by receipts and outlays, then we may say that here the capital is massed in one sum; concentration takes the place of diffusion, extensive force is transformed into intensive. It is no wonder therefore if in this state of mental erethism the ecstasist seems to be transfigured, lifted above herself. Certainly the visions of the rude peasant girl of Sanderet who saw a virgin all of gold in a silvery paradise, bear but little resemblance to those of a Saint Theresa; but every intelligence does its maximum in the moment of ecstasy.

Is there any need now of inquiring why there is neither choice nor acts in that state? How could there be choice, seeing that choice presupposes the existence of that complex whole, the Ego, which has disappeared? The personality being reduced to one idea or one vision, there is no state that can be chosen, that is incorporated with the whole, to the exclusion of others. In a word there is nothing that can choose, nothing that can be chosen. As well might we suppose an election without either electors or candidates.

Thus action is nipped in the bud, utterly estopped. Only its elementary forms remain, as the respiratory movements, etc., without which organic life were impossible. We have here a curious instance of psychological correlation or antagonism: whatever one function gains is lost by some other: whatever thought gains is lost by movement. In this respect ecstasy is the opposite of the states in which mo-

tility is predominant, as epilepsy, chorea, convulsions, etc. In these cases we see maximum of movements, minimum of consciousness: in ecstasy intensity of consciousness with minimum of movement. There is at all times only a certain sum of nervous and psychic force available: if this is monopolized by one function, the other functions are impoverished. Whether the excess shall be on the one side or on the other depends on the nature of the individual.

Having studied extinction of the will in its highest phase, we may remark that we find in the act of contemplation, of profound reflection, modified and minor forms of the same phenomenon. The unfitness of contemplative minds for action has its physiological and psychological reasons, and these are explained to us by the state of ecstasy.

It is of equal interest to the psychologist and to the physiologist to know what it is that produces abolition of consciousness in somnambulism whether natural or artificially induced, and from what organic conditions it results. But though the subject has been a matter of eager research for some years, we have nothing to offer but theories, and the reader may choose between several hypotheses. Some authors, as Schneider and Berger, regard it as a result of "expectant attention" producing a unilateral and abnormal concentration of consciousness. Preyer holds it to be a special case coming under his theory of sleep. Other authors, as Rumpf, favor the theory of reflex changes in the cerebral circulation—hyperæmia and anæmia in the surface of the hemispheres of the brain. Heidenhain who opposes this last theory refers hypnotism to an inhibiting action. There occurs, he says, a suspension of the activity of the cortical nerve cells, probably resulting from a change in their molecular arrangement, and in this way the functional movement of the gray matter is interrupted. This hypothesis seems to be most in favor, and since it is, at least from the psychological standpoint, simply a statement of fact, we may adopt it.

There is no need to describe a state so many times described before, and that so carefully. We would merely remark that the terms somnambulism, hypnotism and their analogues do not designate a state identical in all individuals and in every case. This state varies in the same individual from simple drowsiness to profound stupor; between one individual and

another it varies according to their respective constitutions,* pathological conditions, etc. It would therefore be illogical to affirm that there is always abolition of the will power. As we shall see, some cases are very doubtful.

Take first hypnotism in the form designated by many authors Lethargic. The mental inertia here is absolute; consciousness is utterly gone; the reflex actions are in excess—an excess which always keeps pace with the decline of the higher activity. At a word from the operator, the hypnotized subject rises, walks, sits down, sees absent persons, goes on a journey, describes the landscape, and so on. The only will, as we say, is that of the operator. The meaning of this expressed in more precise terms, is: In the vacant field of consciousness a state is called up; and since states of consciousness tend to action, whether immediately or after having called forth associations, an act follows. The passage to action is here all the easier because there is nothing that hinders it, neither power of inhibition nor an antagonistic state, the idea suggested by the operator having the sole dominion in the slumbering consciousness. Other phenomena apparently more anomalous are explained in the same way. We know that by giving to the members of the hypnotized subject certain postures we can awaken in him the emotion of pride, terror, lowness, devotion, etc.; if we place him in the position for climbing, he makes as though he were going up a ladder; if we put in his hands any instrument he has been wont to employ, he goes to work with it. Plainly the position given to the members awakens in the cerebral centers the corresponding states of consciousness with which they have become associated by much repetition. The idea, once it is awakened, is in the same condition as one coming from the direct order or suggestion of the operator. All these cases therefore are reducible to the same formula: the hypnotized subject is an automaton that is made to act according to the nature of his organization. There is absolute abolition of will, the conscious personality being reduced to one single state which is neither chosen nor rejected, but suffered, imposed.

The automatism is spontaneous in natural somnambulism; in other words, it has for its antecedent some cerebral state, and that in turn has for its antecedent some special excitation in the organism. Often the automatism is of a high order: the series of states of consciousness called

out is long and each term of the series is complex. As its type we may cite the singer whose history is given by Mesnet. If a cane were offered to him he would take it to be a musket, his recollections of army life coming back to him; he would load his weapon, lie prone upon the ground, take aim and fire. Give him a roll of paper, and his recollection of his present calling were called forth; he would open the roll and sing at the top of his voice.* But the unvarying repetition of the same acts in the same order in each paroxysm gives to all these phenomena a very definite character of automatism from which all will power is eliminated.

Some cases however are doubtful. Burdach tells of "a very fine ode" that was composed in the somnambulant state. The story has often been told of the abbé who in preparing a sermon corrected and pruned his sentences, changed the places of epithets, etc. Again, a man made sundry attempts at suicide and each time tried different means. Facts of this kind are so numerous that, even making allowance for credulity and exaggeration, it is impossible to reject them all.

It might be said that such acts involve comparison followed by a choice, a preference—in other words a volition: and hence that we have here will power, that is a true reaction of the individual, faint, indeed, obscure, limited, but active.

But we may also hold that automatism is of itself sufficient. For is it not a recognized truth that in the normal state the intellectual work is often automatic, and all the more valuable on that account? Is not what the poets call inspiration an involuntary and almost unconscious sort of brain work—at least is it not conscious only in its results? We read our own writings over again, and our corrections are often spontaneous, that is to say, the movement of thought brings a new association of words and ideas which is immediately substituted for the other. Hence it may be that the individual as one that chooses and prefers is here of no account. Examining the matter more minutely, we may hold that all these cases are not strictly comparable: if to compose an ode automatism suffices, it does not suffice for correcting it; in the latter case there is choice, however rapid, however insignificant we may suppose it to be. Instead of a zero of will we should have a minimum of will. This opinion is reduci-

* "De l'Automatisme de la Mémoire et du Soudain dans le Somnambulisme Pathologique." Paris, 1874.

ble to the first, and differs from it only by a hair's breadth.

The reader will choose between these two interpretations. I pass now to cases in which the data are more definitely ascertained. We find among hypnotized subjects instances of *resistance*. An order is not obeyed, a suggestion is not followed immediately. The mesmerists of the last century recommended the operator to assume the tone of authority and advised the subject to practice trust, confidence, which produce assent and prevent resistance.

"While in the state of somnambulism B. performed certain acts at the word of command, but others she refused to perform. Usually she would not read though we are confident she could see, despite the apparent occlusion of her eyelids. When her hands were placed in the attitude of prayer, her mind was impressed accordingly. Asked what she was doing, she said she was praying to the Blessed Virgin, but that she did not see her. So long as her hands remained in the same position, she continued her prayer, and *showed displeasure* if any one sought to distract her. When the position of the hands was changed, the praying ceased immediately. However exempt it may be from will action, the praying is in this case in some sort under the control of the reason, for the subject shows a dislike to being distracted, and is able to argue with any one who would interrupt her prayer."* One of Richer's subjects readily allowed himself to be metamorphosed into an officer, a sailor, etc., but he refused with tears in his eyes to be transformed into a priest. This was sufficiently explained by the man's habits and the atmosphere in which he had lived.

Hence there are cases in which two states co-exist—one produced by outside influences, the other by influences from within. We know what the automatic power of the former is. But in the other state this is effaced by a contrary state: there is here something resembling inhibition. But the inhibition is so weak that commonly it succumbs before repeated attacks: and it is so vague that we cannot say what its nature is. Is it not simply an antagonistic state of consciousness awakened by the very suggestion, so that it would all amount to the co-existence of two contrary states of consciousness? Or is the case more complex, and must we

say that it represents the sum of the tendencies still existing in the individual, and some residue of that which constitutes his character? If we accept Heidenhain's theory we must recognize in the so called lethargic state a complete arrest of functional activity; the order or the suggestion of the operator would set in action an exceedingly limited number of nerve elements in the cortex; but in the state of resistance we should see awakening from their sleep some of those elements which in the normal state constitute the physiological and psychological basis of the individuality, being the synthetic expression of the organism. It must be confessed that, even admitting this second hypothesis, all that would remain of will power, of the individual's power of reacting according to his nature, would be an embryo, a power so stripped of efficacy that it is hardly to be called will.

Again it may be remarked that if it is difficult for the observer to say what power of reacting persists in the person who resists, the person himself is no better judge. "A close analysis of the phenomena such as can be made by educated, intelligent men submitting to the action of animal magnetism, proves how difficult it is even for the magnetized patient to make sure that he is not simulating. To make these observations, the sleep should not be very profound. In the period of *engourdissement* consciousness is retained, but nevertheless there is a very plain automatism." A physician of Breslau told Heidenhain that magnetization made no impression on him; yet after he had been brought into the state of *engourdissement*, he was unable to pronounce a single word. On being awakened, he declared that he could have spoken easily enough, and that if he had said nothing, it was because he had preferred not to speak. Put in the state of *engourdissement* again by a few passes, he was again unable to speak. Once more he was awakened, and had to confess that if he had not spoken the reason was that he could not speak. A friend of mine having been *engourdi*, and not quite put to sleep, observed closely this phenomenon of impotence coincident with the illusion of the possession of power. When I indicate to him a movement to be performed, he always executes it, though before being magnetized he was quite determined to resist. This he has the greatest difficulty in accounting for after awakening. 'Certainly,' he says, 'I could resist, but I have not the will to do so.' Sometimes he is tempted to believe that

* P. Richer, "Étude sur l'Hystéro-Épilepsie," pp. 426, 427.

he is simulating. 'When I am dozing,' he says, 'I simulate automatism though I could, as it seems to me, act otherwise. I begin with the firm resolve not to simulate, but in spite of me when sleep begins it seems to me that I simulate.' Of course this sort of simulation of a phenomenon is absolutely identical with its reality. Automatism is demonstrated by the very fact that perfectly honest subjects are unable to act otherwise than as automata. It is of little consequence that they imagine that they are able to resist. *They do not resist.* That is the fact that must be taken into consideration, and not the illusion that possesses them that they have the power of resistance."*

Still this power of resistance, weak though it be, is not equal to zero: it is a last survival of the individual reaction exceedingly reduced; it is on the confine of nullity but does not pass over. The illusion of this feeble power of inhibition must answer to some equally precarious physiological state. In short the state of somnambulism whether natural or induced may justly be regarded as a state of abolition of the will. Exceptions are rare and obscure, but they bring their own measure of instruction. They prove once again that volition is not an invariable quantity, but that it diminishes till the point is reached where we may with equally good reason either affirm or deny its existence.

I will mention in passing a fact that hardly belongs to the pathology of the will but which furnishes matter for reflection. Certain hypnotized subjects may be commanded to perform an action at some future time, at a given time in the same day, or even at a later time, say eight or ten days hence. After they have come to, they execute the command at the prescribed time, on the appointed day, commonly saying that they know not why. In some curious instances these persons give specious reasons to explain their conduct, to justify this act which does not spring from their own spontaneity, but is imposed upon them though they know it not. I cite a case that came under my own observation. A young man at 10 o'clock ordered his mistress who was in the hypnotic state to leave him at three o'clock in the morning; then he restored her to the normal state. Toward three o'clock she awoke, made ready to go, and though he begged her to stay, she found reasons to excuse and justify her going at

that unseasonable hour. "Our illusion of free will," says Spinoza, "is only ignorance of the motives that lead us to act." Do not facts of this kind support the dictum?*

CHAPTER VII.

CONCLUSION.

HAVING examined the different morbid types, let us now see whether we can discover a law which shall sum up the pathology of the will and throw some light upon the normal state.

As a matter of fact, volition alone exists, that is to say a choice followed by acts. Certain conditions are requisite to produce a volition. A lack of impulsion or of inhibition, an excess of automatic activity, of a tendency, of an appetite, a fixed idea, all these may prevent volition for a moment, an hour, a day, a period of one's life. The sum of these necessary and sufficient conditions may be called will. With respect to volition the will is a cause, though it is itself a sum of effects, a resultant varying with its elements. This has been proved by pathology.

These elements, briefly stated, are as follows: 1. Tendencies toward action (or inhibition) resulting from the circumstances, the surroundings, the counsels, the education that influence a person. In a word all tendencies which are the effect of external causes.

2. Character, the principal element, which is the effect of interior causes, and not an entity but the resultant of the innumerable infinitesimal states and tendencies of all the anatomical elements that constitute a given organism. Or briefly, character is for us the psychological expression of a given organism, deriving from it its proper complexion, its special tone and its relative permanence. It is the ultimate stratum whereon rests the possibility of will and which makes the will strong or weak, intermittent, average or extraordinary.

If now we consider the will not in its constituent elements but in the phases through which it passes in its evolution, we see that volition is the final term in a progressive series whereof simple reflex action is the first step. It is the highest form of activity—activity being understood

* Ch. Richet, in the "Revue Philosophique," 1883.

* Many similar facts are recorded in Ch. Richet's article already quoted, "Rev. Philos.," March, 1883.

in the precise sense of power to produce acts, power of reaction.

The will has for its basis a legacy coming down from generations innumerable, and registered in the organism, namely primordial automatic activity, which is almost invariable, and quite unconscious, although in the distant past it must have been accompanied by a rudiment of consciousness which later faded away, in proportion as coördination, growing more perfect, became organic in the species.

Upon this basis rests the conscious and individual activity of the appetites, desires, feelings, passions, whose coördination is more complex and far less stable.

Higher still we have ideomotor activity which in its extreme manifestations attains a coördination at once very stable and very complex: this is perfect volition.

It may therefore be said that perfect volition has for its coördination a *hierarchical coördination*, that is to say, it is not enough that reflex actions be coördinated with reflex actions, rational tendencies with rational tendencies, but there must be coördination between these different groups—coördination with subordination, so that all shall converge toward a single point, namely the end to be attained. Let the reader recall the morbid cases already cited, and in particular those irresistible impulses which in themselves represent almost the entire pathology of the will, and he will see that they are all reducible to this formula: Absence of hierarchic coördination, independent, irregular, isolated, anarchic action.

Hence whether we regard the will in its constituent elements or in the successive phases of its genesis—and the two aspects are inseparable,—we see that its ultimate result, volition, is not a phenomenon supervening we know not whence, but that it has its root deep in the nature of the individual, nay beyond the individual in the species and in all species. It comes not from above but from below; it is a sublimation of the lower elements. Volition may be compared to the keystone of an arch. To that stone the arch owes its strength, even its existence; nevertheless this stone derives its power from the other stones that support it and press it on all sides, as it in turn presses them and gives them stability.

These preliminary observations were requisite for an understanding of the law which governs overthrow of the will; for if the foregoing considerations be just, then since dissolution always pursues a course the reverse of that followed by ev-

olution, it follows that the more complex will manifestations must disappear before the more simple and the more simple before automatism. To express the law in its exact form, and regarding volition not as a phenomenon *sui generis* but as the highest manifestation of individual activity, we should say that dissolution proceeds in a retrograde direction from the more voluntary and the more complex to the less voluntary and the more simple, *i.e.* toward automatism. We have now to show that this law is confirmed by facts, and here we have only to select our materials.

In 1868 Hughlings Jackson, while engaged in the study of certain disorders of the nervous system, observed, for the first time as I believe, that the more voluntary and the more specialized movements and faculties are the first to be affected, and that in a greater degree than the others.* This "principle of dissolution," or of "reduction to a more automatic state" was proposed by Dr. Jackson as the correlative of Herbert Spencer's doctrines touching the evolution of the nervous system. He takes a very simple case, that of hemiplegia from lesion of the corpus striatum. A clot of blood here makes an experiment for us. The patient, whose face, tongue, one arm and one leg are paralyzed, has lost the more voluntary movements of a portion of his body, without losing the more automatic movements. The study of cases of hemiplegia, says he,† proves that the external parts which suffer most are those which psychologically speaking are most controlled by the will, and which physiologically speaking imply the greatest number of different movements, produced with the greatest number of different intervals. If the lesion be serious and if it affect not only the more voluntary parts, as face, arms, legs, but also those which are less voluntary, as when the patient loses the power of certain movements of the eyes, the head and one side of the chest, we find that the more voluntary parts are much more gravely paralyzed than the others.

So too Ferrier observes ‡ that the general destruction of the motor region in the cortex, as of the corpus striatum, produces the same relative disorder of the different movements, those movements being most

* "Clinical and Physiological Researches on the Nervous System." London, 1875.

† "Clinical and Physiological Researches on the Nervous System."

‡ "Localization of Diseases of the Brain."

affected and paralyzed which are most under the influence of the will, at least after the first shock has passed away. Facial paralysis has its seat especially in the inferior facial region, and affects the more independent movements, the frontal and the orbicular muscles being only slightly affected. The movements of the legs are less affected than those of the arm, and those of the arm less than those of the hand.

The same author draws a distinction between the different *kinds* of movements and their respective centers—those which imply consciousness (and which are called voluntary in the strict sense of the word), and those which are described as automatic, instinctive, responsive (including motor-adaptations of the equilibrium and of motor-coördination, and the instinctive expression of the emotions) which are more or less perfectly organized in the centers underlying the cortex. And he says that the latter possess a relative independence which is at its maximum in the lower vertebrates (the frog, the pigeon) and at the minimum in the monkey and in man. He thinks that in animals whose motor faculties do not seem to suffer much from destructive lesion of the nervous centers, those movements are paralyzed which imply consciousness (voluntary movements) and which are not automatically organized. This, he adds, is proved by the researches made by Goltz. That author has shown that though the paw of a dog is not absolutely paralyzed as an organ of locomotion by lesion of the cortex, it is absolutely paralyzed *in so far as it serves as a hand and is employed as such*. This observation is of prime importance for us, as showing that when an organ is adapted both for locomotion and prehension, the former function persists, though impaired, while the latter function, which is the more delicate one, disappears.*

The instability of the voluntary, complex, higher action as compared with the automatic, simple, lower action is seen again in a *progressive* form in general paralysis of the insane. "The earliest imperfections of the motor power," says Foville, "those which betray themselves

by a beginning, and hardly a beginning even of a break in the harmony of the muscle contractions, are the more readily appreciated because they concern the more delicate movements, and those which require the greatest precision and the greatest perfection. Hence it is not surprising that the delicate muscular movements which go to produce phonation should be the first affected." It is known that an impediment of speech is one of the first symptoms of this malady. Though at first this is so slight that only a practiced ear can detect it, the defect of pronunciation increases steadily and ends at last in unintelligible babble. "The muscles which aid in articulation lose all their harmony of action; they are able to contract only with an effort; the words spoken cannot be understood. In the several members lesions of the motility at first affect only the movements that require the greatest precision. The patient can walk long distances and can use the arm in work that only calls for general movements; but he is unable to perform any of the minor and more delicate operations of the fingers without some degree of tremor, and he has to try again and again. The defect is noticed when the man is asked to pick up a pin from the ground, to wind his watch, etc. Artisans accustomed in their trade to work of great exactitude are incapacitated far more quickly than those whose tasks require but little precision. In writing the pen is held with a degree of indecision which manifests itself in the more or less irregular form of the letters. And as the disease progresses the handwriting becomes more tremulous and irregular, so that by comparing a series of letters written at different periods, we may trace the progress of the malady, till in the end the patient becomes quite unable to write.

"At a later stage the vacillation of the superior members is seen even in their general movements: owing to tremulousness and feebleness of the muscles of the arm the patient is unable to pass food to his mouth, to take out his handkerchief or to replace it in his pocket, etc.

"In the inferior members the course of the malady is much the same. At first insane general paralytics are able to walk firmly when going straight forward: but when they have to turn to the right or to the left, and above all when they have to wheel round in order to retrace their steps, they show hesitation and lack of precision in their movements. Later, even when they are walking straight forward, they

* Ferrier, "Localization," etc. From Goltz's experiments it appears that if the lesion is in the left brain, then in all movements in which the dog was wont to employ the fore paw as a *hand*, he gives up the use of the right paw. Thus he will hold a bone with the left fore paw only, and will employ only that paw in scratching the ground, or in touching his wound. If the dog has been trained to give his paw, he will, after mutilation, give only the left paw. (Goltz, in "Dict. Encycl. des Sci. Méd.," art. NERVEUX.)

advance with a heavy tread and with ill-coördinated steps. Later still they have difficulty in making even a few paces."*

Compare the disorders of the motor system which follow the abuse of alcohol. Tremor is one of the earliest phenomena. "The hands are first affected, next the arms, the legs, the tongue and the lips. As the disorder progresses the tremulousness becomes complicated with another affection of a more serious kind, muscular debility. This too first affects the superior member in nearly every case. The fingers lose their cunning, the hand holds objects imperfectly and lets them slip from its grasp. Then this feebleness extends to the forearm and to the arm. The patient now can use his superior members only in a very imperfect fashion, and in time he is unable to take his food without assistance. Later these phenomena extend to the inferior members. To stand becomes difficult; the gait is unsteady, tottering; and these symptoms become more and more pronounced from day to day. The muscles of the back in turn succumb, and the patient must keep his bed."†

Compare also what takes place in convulsions, chorea, etc. This steady advance, which for the physician possesses only a clinical interest, has for us a psychological interest. These familiar facts will suffice, I hope, to prove that the course of dissolution is from the complex to the simple, from the voluntary to the automatic, and that the final term of evolution is the initial term of dissolution. We have so far studied, it is true, only the disorganization of movements, but those who treat psychology as a natural science will find here nothing that needs to be restated. Inasmuch as volition is for us not an imperative entity reigning in a world apart, but the ultimate expression of an hierarchic coördination; and as each movement or group of movements is represented in the nerve centers, it is plain that with each group that is paralyzed an element of coördination disappears. If the dissolution is progressive, the coördination, which is continually being stripped of some element, becomes more and more restricted: and since experience shows that the disappearance of movements is in direct ratio to their complexity and their precision, our theory is justified.

We might further pursue this verifi-

* Foville in the "Dictionnaire de Médecine," art. PARALYSIE GÉNÉRALE.

† Fournier, *ibidem*, art. ALCOOLISME.

cation of our law by calling attention to what takes place in diseases of speech. Here we touch upon the inmost mechanism of the mind: but I will not discuss over again a subject I have already treated at length. In "The Diseases of Memory,"* I have endeavored to show that many cases of aphasia result from motor amnesia, that is, from a forgetfulness of motor elements, of those movements which constitute articulate speech. I will simply repeat that it was an observation of Trousseau that "aphasia is always reducible to a loss of memory either of the vocal signs or of the means whereby words are articulated;" and that W. Ogle also recognizes two word memories—one, recognized by every one, whereby we are conscious of a word, and besides this another whereby we express it. This forgetfulness of the movements, though primarily it is a disease of memory, reveals to us furthermore an impairment of the motor power, a disordered condition of voluntary coördination. The patient wishes to express himself, but his volition comes to naught or manifests itself imperfectly; that is to say the sum of the coördinated tendencies which at the moment constitute the individual in so far as he would express himself, is partially hindered in its passage into act; and experience teaches us that this impotence of expression affects first words, *i.e.* rational speech; next exclamatory phrases, interjections, what Max Müller calls emotional language; lastly, and only in rare cases, gesture. Here too then dissolution proceeds from the more complex to the less complex and to the simple: from the voluntary to the semivoluntary and the automatic; but the latter is in most cases unaffected.

We may now advance further into the purely psychic life, but here all becomes vague and fluctuating. As we no longer can refer each volition to a group of movements of the vocal, locomotory or prehensile organs, we must needs grope. Still we cannot but perceive that the highest form of volition, voluntary attention, is rarest of all and the most instable. If instead of considering voluntary attention † after the fashion of the subjective psychologist who studies himself and there halts, we consider it in the mass of sane adult persons, in order to determine approxi-

* See HUMBOLDT LIBRARY, No. 46, Chapter III., page 39.

† We do not speak of involuntary attention, which is natural, spontaneous. This point has already been explained in Chapter IV.

mately what place it holds in their mental life, we shall see how seldom it occurs and for how short a time it lasts. If it were possible to survey humanity as a whole for a given period of time, and to compare the sum of the acts produced by voluntary attention with the sum of the acts produced without it, we should find the ratio to be nearly as zero to infinity. By reason of its very superiority and its extreme complexity, it is a state, a coördination* that can seldom come into existence and which begins to break up as soon as it is formed.

To confine ourselves to admitted facts, is it not a familiar observation that inability to hold the mind attentive is one of the first symptoms of mental impairment whether temporary as in fevers, or permanent as in insanity? The highest form of coördination therefore is the most unstable, even in the purely psychological order.

And what is this law of dissolution but a phase of the great biological law already pointed out with respect to memory, viz., that the functions last to be acquired are the first to degenerate. In the individual automatic coördination precedes coördination springing from the appetites and passions; this latter precedes voluntary coördination: and the simpler forms of voluntary attention precede the more complex. In the development of species, according to the evolution theory, the lower forms of activity existed alone for ages; then with the increasing complexity of the coördinations came will. Hence a return to the reign of impulsions, with whatever brilliant qualities of mind it may be accompanied, is in itself a regression. This being so, the following passage from Herbert Spencer will serve us as a summation and a conclusion upon this point: †

“There is one other trait of nervous debility on which a few words may be said—the accompanying change of character or modification of the emotional nature.

“Even small ebbings of the nervous fluid hardly to be called abnormal produce slight modifications of this kind, as is observable in children. The highest coördinating plexuses being in them the least developed, children betray more quickly than adults any defective action of these plexuses; and they habitually do this when the general nervous pressure is

below par. Sluggishness of the alimentary canal, implying partial failure of nutrition and decreased genesis of energy, is accompanied by fretfulness—by a display of the lower impulses uncontrolled by the higher.

“It is however in the chronically nervous whose blood, deteriorated in quality and feebly propelled, fails to keep up a due activity of molecular change, that we see this connection of phenomena most clearly. The irascibility of persons in this state is matter of common remark; and irascibility implies a relative inactivity of the superior feelings. It results when a sudden discharge, sent by a pain or annoyance through those plexuses which adjust the conduct to painful and annoying agencies, is unaccompanied by a discharge through those plexuses which adjust the conduct to many circumstances instead of a single circumstance. That deficient genesis of nervous fluid accounts for this loss of emotional balance is a corollary from all that has gone before. The plexuses which coördinate the defensive and destructive activities, and in which are seated the accompanying feelings of antagonism and anger, are inherited from all antecedent races of creatures, and are therefore well organized—so well organized that the child in arms shows them in action. But the plexuses which by connecting and coördinating a variety of inferior plexuses adapt the behavior to a variety of external requirements have been but recently evolved; so that besides being extensive and intricate they are formed of much less permeable channels. Hence when the nervous system is not fully charged these latest and highest structures are the first to fail. Instead of being instant to act, their actions, if appreciable at all, come too late to check the actions of subordinate structures.”

Having step by step followed the course of dissolution of the will, the fundamental result seems to be that the will is a coördination varying in complexity and in degree; that this coördination is the condition of all volition; and that when the coördination is either partially or wholly broken up, volition is either abolished or maimed. Upon this result we would now insist, limiting ourselves to a few brief suggestions upon certain points.

I. Let us first examine the material conditions of this coördination. Will, though among a privileged few it attains extraordinary power and performs great feats, has a very lowly origin. It has its rise in a biological property inherent in all living matter and known as irritability, that is to say reaction against external forces. Irritability—the physiological form of the law of inertia—is in some sense a state of primordial indifferenciation whence shall spring, by an ulterior differentiation, sensibility properly so called and motility, those two great bases of psychic life.

* Just as groups of simple movements have to be organized and coördinated to allow of the higher coördination from which come delicate and complex movements; so must groups of simple states of consciousness be organized, associated and coördinated to allow of this higher coördination called attention.

† “Principles of Psychology,” vol. i., § 262.

Motility, which alone concerns us here, manifests itself even in the vegetal kingdom under divers forms, as by the movements of certain spores, of the Sensitive Plant, of *Dionæa* and sundry other plants to which Darwin has devoted a well known work. The apparently homogeneous protoplasmic mass which alone constitutes certain rudimentary organisms, is possessed of motility. The amœba, the *white* corpuscle of the blood, move little by little by the aid of the processes which they send out. These facts which are described in many special works teach us that motility made its appearance long before the muscles and the nervous system.

We have no occasion to follow the evolution of these two apparatus through the animal series. We would only remark that researches upon the localization of the motor centers—a subject that very nearly concerns the mechanism of the will—have led some physiologists to study the state of these centers in new-born animals. "This investigation, very carefully made by Soltmann in 1875, gave the following results: In hares and dogs, there does not exist, immediately after birth, any point in the cortex capable, under electric irritation, of producing movements. Not until the tenth day are the centers for the anterior members developed. On the thirteenth day the centers for the posterior members appear. On the sixteenth these centers are distinguishable from one another and from those belonging to the face. One conclusion to be drawn from these results is that the absence of voluntary motor direction coincides with the absence of the corresponding organs, and that the more the animal becomes master of its movements, the cerebral centers in which the volitional process takes place gain a more manifest independence."*

Flechsig and Parrot have studied the development of the brain in the fœtus and in the infant. From the researches of the latter author † it appears that if we follow the development of the white matter of an entire hemisphere, we find it rising successively from the peduncle to the optic thalami, then to the internal capsule, to the hemispheric center, and finally to the mantle of the brain. The parts which are slowest to develop are those which are destined to perform the highest functions.

The formative period past, the mechanism of will action seems to be as follows: The incitation starts from the so called

motor regions of the cortex (parietofrontal region) and follows the pyramidal fasciculus called by some authors the voluntary fasciculus. This fasciculus which is formed by the grouping of all the fibers coming from the motor convolutions, descends through the oval center, and forms a small part of the internal capsule, which as we know penetrates into the corpus striatum "like a wedge into a piece of timber." Then it follows the peduncle and the medulla where it undergoes more or less perfect decussation and passes to the opposite side of the cord, so forming a great commissure between the motor convolutions and the gray matter of the cord, from which are given out the motor nerves. This rough sketch gives some notion of the complexity of the elements requisite for will action, and of the close connection which exists between them.*

Unfortunately there are differences as to the interpretation of the real nature of the brain centers from which comes the incitation. According to Ferrier and many other authors these are motor centers in the strict sense, that is to say, in them and through them the movement begins. Schiff, Hitzig, Nothnagel, Charlton Bastian and Munk have given other interpretations not all of equal clearness or of equal probability. But they generally agree in regarding these centers as being rather "sensory" in their nature, the motor function proper being referred to the corpus striatum. "The nervous fibers that extend from the cerebral cortex, in higher animals and in man, down to the corpora striata are in their nature strictly comparable with the fibers connecting the 'sensory' and the 'motor' cells in an ordinary nervous

* The process is described as follows by Dr. Charlton Bastian. Taking the spinal and medullary mechanisms as being either developed or in process of development we may now turn our attention more particularly to a consideration of the parts whence and of the channels through which cerebral incitations pass in emotional, ideomotor and volitional movements. One part of the route has been pretty clearly defined.

Motor stimuli pass from certain parts of the cerebral cortex downward to the corresponding corpora striata. These bodies are called into activity in a way which cannot be defined, though from them the motor stimuli seem to be continued and redirected toward the motor mechanisms in the medulla and spinal cord. The tracks of these latter stimuli are fairly well known. They pass from each corpus striatum through the inferior layers of the crus cerebri and through the pons Varolii on the same side; while below this bridge they are gathered together in the anterior pyramid of the medulla, which after a course of a little more than an inch decussates in part with its fellow, so that many of the fibers of each pyramid pass over into the opposite lateral column of the cord, while some continue to descend on the same side in the anterior column.—"The Brain as an Organ of Mind," chap. xxvi.

* François-Franck, in the "Dictionnaire Encycl. des Sci. Méd.," art. NERVEUX, p. 585.

† "Archives de Physiologie," 1879.

mechanism for reflex action."* In other words, there exists in the cortex "circumscribed regions experimental excitation of which produces in the opposite side of the body determinate localized movements. Seemingly these points ought to be regarded much rather as centers of voluntary association than as motor centers properly so called. They are the seat of incitements to voluntary movements, and not actual starting points of movements. They are to be compared rather to the peripheric organs of sense than to the motor apparatus of the anterior cornua of the medulla. These centers then are psychomotor centers because by their purely psychic action they command true motor apparatus. . . . We believe that the different points indicated as motor centers for the members, the face, etc., correspond to the apparatus which receive and transform into voluntary incitation the sensations of peripheric origin. These are volitional centers, not true motor centers."†

But notwithstanding this question remains still undecided, and notwithstanding the matters of detail respecting the part played by the cerebellum that are as yet undetermined, we may say with Charlton Bastian that "if since Hume's time we have not learned in any full sense of the term 'the means by which the motion of our bodies follows upon the command of our will,' we have at least learned something as to the parts chiefly concerned, and thus as to the paths traversed by volitional stimuli."‡

II. If we look at the question on its psychological side, voluntary coördination assumes so many forms and exists in so many degrees that we can only note its principal features. It would be the natural course to consider the lowest form, but I judge it best, for the sake of clearness, to follow the reverse order.

Coördination of the most perfect kind is seen in great men of action whatever be the nature of their activity—in Cæsar, Michelangelo or Saint Vincent de Paul. Its properties are unity, stability, power. The outer unity of such men's lives is founded on the unity of their aim which they steadily pursue, and which according to circumstances makes new coördinations and adaptations. But this outer unity itself is but the expression of an inner unity—the unity of their character. It is be-

cause they remain the same that their aim is the same. What is fundamental in their nature is a mighty, irrepressible passion which controls all their thoughts. This passion is the man—the psychic expression of his constitution as nature made it. Such men present the type of a life always in harmony with itself, because in them everything conspires and converges to a definite aim. Such characters are found in everyday life, but they are unknown to fame because either loftiness of aim, or circumstances, or, above all, strength of passion has been lacking. They possess only stability. The great historic Stoics, as Epictetus and Thræseas—I speak not of their Sage, who is only an abstract ideal—have realized this higher type of will in its negative form—inhibition—conformably to the maxim of the school, Bear and refrain.

Below this grade of perfect coördination, there are characters that show an intermittence of coördination: whose center of gravity, while ordinarily stable, oscillates nevertheless from time to time. A group of tendencies will temporarily secede from the coördination, expressing, so far as they are active, one side of the character. Neither as regards themselves nor as regards others have these individuals the unity characteristic of strong wills; the more frequent and the more complex these infractions of perfect coördination, the less is the will power.

Lower in the scale we find lives in which two contrary or two different tendencies reign alternately. There are in the individual two alternating centers of gravity, two points of convergence for coördinations successively preponderant but partial. This type is perhaps the most common one, as we may convince ourselves by looking about us or by consulting the poets and the novelists of every age who are ever declaring that there are two natures in every one. The number of these successive coördinations may be larger still; but it is useless to pursue further this analysis.

One step more and we enter the region of pathology. Take a case where sudden and irresistible impulses hold the will every moment in check: here is an unduly strong tendency ever destroying the equilibrium, for its intensity will not allow of its being coördinated with the other tendencies: it commands instead of subordinating itself. And when such impulses have come to be not an accident but a habit, not one side of the character but the character itself, then there is only an

* Bastian, "The Brain as an Organ of Mind," chap. xxvi.

† François-Franck, *loc. cit.*

‡ *Loc. cit.*

intermittent coördination—it is the will that becomes the exception then.

Lower still, and will is simply accidental. In the indefinite succession of impulsions that vary from minute to minute, a chance volition finds only at long intervals its conditions of existence. Caprices take the place of volitions. The hysterical character furnishes the type of this perfect *incoördination*. Here we reach the final term of the will. At a grade lower than this there are no diseases of the will, but an arrest of development which precludes will altogether. Such is the state of idiots and imbeciles. We will add a few remarks upon these mental states in order to complete our pathological study.

"In profound idiocy," says Griesinger, "effort and determination to action are always instinctive. Generally they are prompted by the craving for food, and in most instances they possess the character of reflex actions of which the individual is hardly conscious. Certain simple ideas however may incite them to effort and movement, as when they amuse themselves by playing with bits of paper or the like. Without taking into account those sunk in the profoundest idiocy, the question arises, Is there here anything that represents will? What is there in them that can will?"

"In many idiots of this last class the only thing that seems to arouse the mind in some degree to action, is the desire to eat. The lowest idiots manifest this desire only by grunts and bodily agitation. Those in whom mental degeneration has not gone so far move the lips or the hands slightly, or even cry: thus do they express their desire of food. In idiocy of a less pronounced type, the basis of the character is inconstancy and obtuseness of feeling and weakness of will. The humor of idiots belonging to this class depends on their surroundings and the treatment they receive. They are docile and obedient when well cared for, but perverse and malicious when ill used."*

Before we quit this subject, we would remark that if the will is a coördination, that is to say a sum of relations, it may be affirmed *a priori* that it will be of far rarer occurrence than simpler forms of psychic activity, because a complex state has much less chance of coming into existence and of enduring, than a simple state. And so it is in fact. If in any human life we take note of the parts played by automatism, by habit, by the passions, and above all by imitation, we shall find that the number of acts that are in the strict sense of the term purely voluntary is very small. For the majority of mankind imitation suffices: they are contented to accept that which has been matter of vol-

untary choice by others, and as they think in the thoughts, so they act with the will of the multitude. Viewed in connection with the habits that render it of no use, and with the diseases that maim or destroy it, the will, as we have already said, is a happy accident.

We need hardly observe how closely this coördination, ever growing more complex, of tendencies, which constitutes the different degrees of will, resembles the coördination, ever growing more complex, of sensations and mental images which constitutes the different degrees of intelligence. The one has for its basis and fundamental condition character, the other "forms of thought." They are each a more or less perfect adaptation of the individual to his surroundings whether in respect to action or to cognition.

We are now ready to formulate the general conclusion of this inquiry, already incidentally indicated. It will, I hope, throw light retrospectively upon the path we have been pursuing. It is as follows:

Volition is a final act of consciousness resulting from the more or less complex coördination of a group of states whether conscious, subconscious or unconscious (purely physiological) which all together find expression in an action or in an inhibition. The principal factor of the coördination is character, and character is simply the psychic expression of an individual organism. It is character which gives unity to the coördination, not the abstract unity of the mathematical point, but the concrete unity of a *consensus*. The act whereby this coördination takes place and is affirmed is choice founded on a natural affinity.

Thus volition, so often observed, analyzed and explained by subjective psychologists, is in our view simply a state of consciousness. It is only an effect of that psychophysiological activity, so often described, whereof a part only enters consciousness under the form of a deliberation. Furthermore, *volition is not a cause at all*. The acts and movements that follow volition result directly from the tendencies, feelings, mental images and ideas which have succeeded in being coördinated in the form of a choice: from this group comes all the efficiency. In other terms, and to leave no ambiguity, the psychophysiological work of deliberation results on the one hand in a state of consciousness,—the volition; on the other hand in a sum of movements or inhibitions. *The "I will" shows that a situation exists,*

* Griesinger, *opus citatum*, pp. 433, 434.

but does not constitute it. I should compare it to the verdict of a jury which may be the result of very passionate pleadings and of the charge of the judge, and which may be attended by grave consequences extending far into the future, *but which is an effect and not a cause*, being in law a simple determination, or ascertainment.

If the will be insisted on as a faculty, an entity, all is contradiction, obscurity, confusion. If on the contrary we take the facts as they are, we at least free ourselves of factitious difficulties. We do not have to ask ourselves how an "I will" can make my members to move. That is a mystery that does not need to be explained, for the simple reason that it does not exist, volition being in no sense a cause. We must look for the secret in the natural tendency of feelings and mental images to find expression in movements. Here we have only a very highly complicated case of the law of reflex action in which between the period of excitation and the motor period there appears a capital psychic fact—volition—showing that the first period ends and the second begins.

Observe further how the strange malady called aboulia may be easily explained, and with it the analogous forms considered in Chapter II., and even the simple feebleness of will—hardly a morbid state—so common among persons who say they have the will and act not. The explanation is that the individual organism had two effects to produce and produces only one—the state of consciousness, choice, affirmation; but the motor tendencies are too weak to pass into acts. There is sufficient coördination, but insufficient impulsion. In the case of irresistible acts, on the contrary, impulsion is in excess, while coördination is defective or non-existent.

Thus then we obtain from the study of the pathology these two results, viz., that the "I will" has no efficacy in producing action; and that will in the sane man is a coördination exceedingly complex and instable, and by reason of its very superiority easily broken up, being "the highest force yet introduced by nature—the last consummate efflorescence of all her wondrous works." *

* Maudsley, "Physiology of the Mind."

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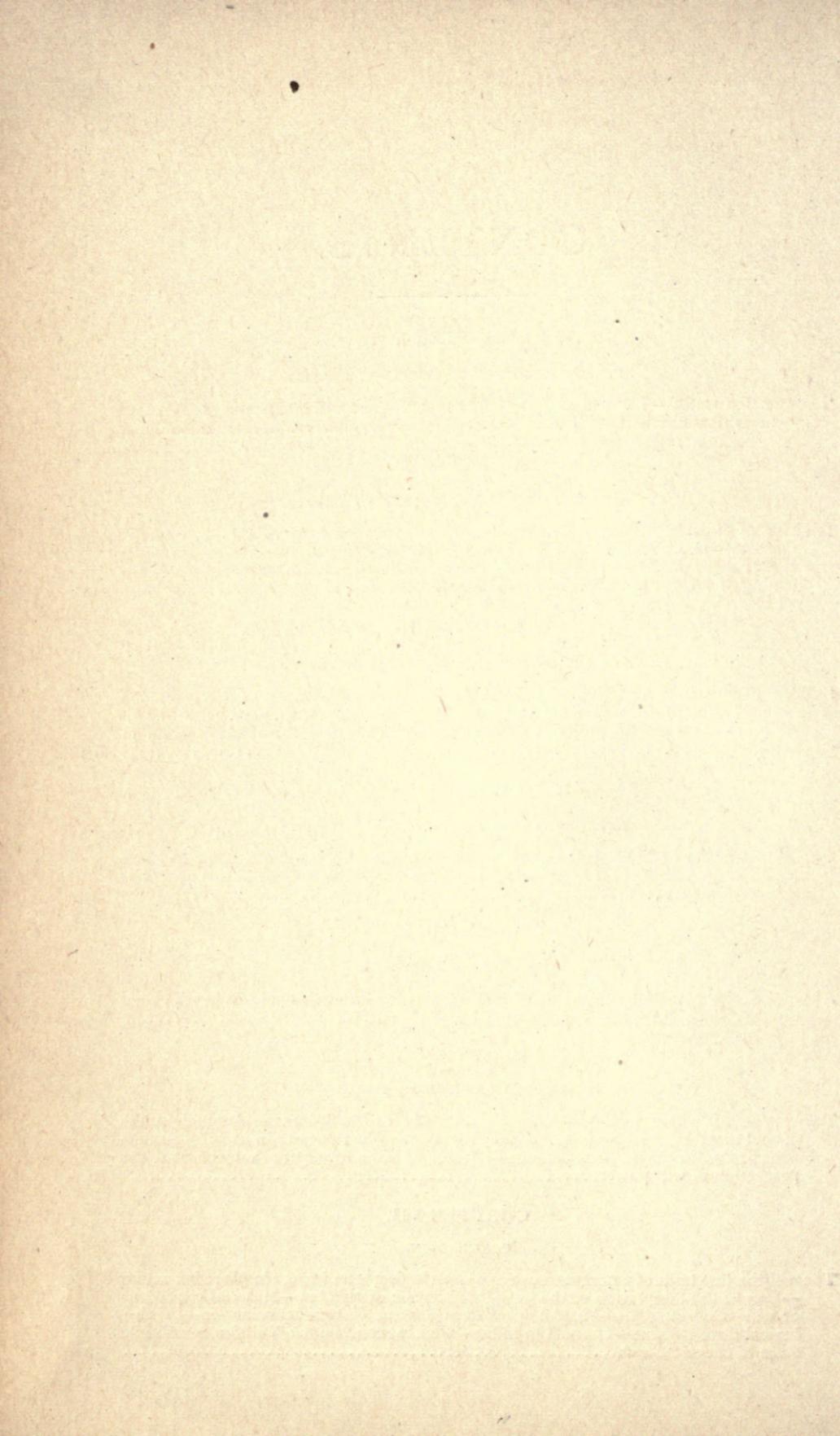
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THE DISEASES OF PERSONALITY.

By TH. RIBOT.

TRANSLATED FROM THE FRENCH BY J. FITZGERALD, M.A.

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CHAPTER I.

INTRODUCTION.—PERSONALITY.—INDIVIDUALITY.—CONSCIOUSNESS.

IN the language of psychology the general meaning of the term "person" is, an individual being that has a clear consciousness of itself and that acts consequently: it is the highest form of individuality. Metaphysical psychology, to explain this character (which it reserves for man exclusively) merely assumes a Me [*ego*], absolutely one, simple, and identical. Unfortunately, the explanation is illusive, the solution only apparent. Unless we assign a supernatural origin to this Me, we must needs explain how it comes to be, and from what lower form it springs. Experimental psychology can neither state the problem in the same way nor treat it by the same method. It learns from natural history how difficult it is in many cases to determine the characters of individuality, far less complex though they be than those of personality; simple, easy solutions it mistrusts, and far from supposing the problem to be resolvable at the first attack, it finds the solution at the final term of its researches, as the result of laborious investigations. It is therefore quite natural that the representatives of the old school, being a little off their bearings, should accuse those of the new school of "stealing their Me," though nobody has attempted anything of the kind. But the language of either side is so different from that of the other, and their methods are so opposite that they no longer understand one another.

At the risk of increasing the confusion, I would try to find out what is to be learned from teratological, or morbid, or merely rare cases, touching the formation and disorganization of personality, but

without pretending to treat the subject in its entirety: that undertaking were, it seems to me, premature.

Personality being the highest form of psychic individuality, a preliminary question arises: What is an individual? Few problems have in our days been more discussed by naturalists than this, and few remain more obscure as regards the lower grades of animal life. It is not yet time to treat it in detail: in the conclusion of this work, after we shall have studied the constituent elements of personality, we will consider personality itself as a whole. Then we shall take occasion to compare personality with the lower forms through which nature has essayed to produce it, and to show that the psychic individual is only the expression of the organism: like it of low grade, undifferentiated, incoherent, or complex and integrated. For the present it suffices to remind the reader who has already some acquaintance with these studies, that as we descend in the animal series, we see the psychic individual formed by more or less perfect fusion of less complex individuals—a colony-consciousness being produced by the co-operation of local consciousness. These discoveries in natural history are of the utmost importance for psychology. Owing to them the problem of personality takes a new form: it must be approached from below; and one is led to ask whether the human personality itself is not a "coalition whole" whose extreme complexity makes its origin difficult to discover, or even inscrutable, did not the existence of elemental forms throw some light upon the process of this fusion.

Human personality—and of this alone can we treat to any purpose, especially in a pathological essay—is a concrete whole, a complex. To know what it is, we must

analyze it, and here analysis is of necessity artificial, for it separates groups of phenomena that are not merely juxtaposed but co-ordinated, and standing toward one another not in the relation of mere simultaneity but of mutual dependence. Still analysis is indispensable. Adopting therefore a division of the subject which I hope will be its own justification, I will consider successively the *Organic*, the *Affective*, and the *Intellective* conditions of personality, laying stress upon anomalies and irregularities. Upon a final survey of the subject we shall group together again these dissevered elements.

But before we begin the exposition and interpretation of the facts, it will be well to have an understanding as to the nature of consciousness. I do not propose to write a monograph on consciousness, for that would cover pretty nearly the whole field of psychology: it will be enough to state the problem with precision.

Details apart, we find only two hypotheses: one very ancient, according to which consciousness is the fundamental property of the "soul," or the "mind," constituting its essence; the other very recent, which regards consciousness as a simple phenomenon superadded to the cerebral activity, as an occurrence having its own conditions of existence, and which comes or goes as circumstances decide.

The former hypothesis has been in vogue so long that it is easy to judge of its merits and its defects. I am not called upon to pass sentence upon it; I will simply show its utter powerlessness to explain the mind's unconscious life. In the first place, for a long time it took no cognizance of this unconscious life. Leibnitz's clear and profound observations on that point lie forgotten or at least in abeyance; and till well on in the present century the most distinguished psychologists (with a few exceptions) restricted themselves to consciousness. At last, when the question must be heard, and when it was clear to every one that to regard psychic life as embracing simply the data of consciousness is a conception so poor and jejune as to be of no use in practice, then the metaphysical psychologists were in a quandary. They adopted the hypothesis of "unconscious states," an ambiguous and semi-contradictory term soon widely accepted: the term itself betrays the confusion of ideas amid which it arose. What is meant by "un-

conscious states?" The wise note their existence, without trying to account for them; the less wise talk of latent thought, of unconscious consciousness—expressions so vague, so illogical, that many authors have admitted as much. In truth, if the soul be defined to be thinking substance, whereof states of consciousness are modifications, it is plainly a contradiction in terms to ascribe to it unconscious states. No fetch of language, no trick of dialectic can help the matter: and forasmuch as the high importance of these unconscious states as factors of psychic life is undeniable, there is no escape from the situation.

The second hypothesis clears the ground of all this logomachy. It does away with the factitious problems that swarm in the first (*e.g.* whether consciousness be a general or a particular faculty, etc.), and we may fearlessly claim for it the benefit of the *lex parcimonie*. It is the simpler, the clearer, the more consistent of the two. Compared with the other, it may be characterized as expressing the unconscious in physiological terms (states of the nervous system) and not in psychological terms (latent thought, sensations not sensed, etc.). But this is only a particular case of the hypothesis: we have now to consider it as a whole.

I would remark first that consciousness, like all general terms, must be resolved into concrete data. Just as there is not a will in general, but only volitions, so there is not a consciousness in general, but only states of consciousness: and these alone are real. As for defining the state of consciousness, the fact of being conscious, that were a vain and idle attempt: it is a datum of observation, an ultimate fact. Physiology shows that its production is always associated with the activity of the nervous system and in particular of the brain. But the converse proposition is not true: though psychic activity always implies nerve activity, nerve activity does not always imply psychic activity. Nerve activity has far greater extension than psychic activity: hence consciousness is something superadded. In other words, we must regard a state of consciousness as a complex fact (*événement*, event, occurrence) which presupposes a particular state of the nervous system; nor is this nervous process an accessory but on the contrary an integral part of the fact—nay, its groundwork, its fundamental condition; once produced, the fact exists *in* itself; when

consciousness is added, the fact exists for itself; consciousness completes it, gives it the finishing touch, but does not constitute it.

Upon this hypothesis we readily understand how every manifestation of psychic life—sensations, desires, feelings, volitions, recollections, reasonings, inventions, etc., may be alternately conscious and unconscious. There is nothing mysterious in this alternation, because in every case the essential conditions, *i.e.*, the physiological conditions, remain the same, and consciousness is only complementary—the finish.

The question would remain, why this finish sometimes is added, sometimes is lacking; for were there not in the physiological phenomenon itself something more in the former case than in the latter, the adverse hypothesis would be indirectly strengthened. If it could be shown that whenever certain physiological conditions are present there is consciousness, that when they disappear, consciousness too disappears, and that when they vary, consciousness varies: then we should have no longer an hypothesis but a scientific truth. That is a distant prospect indeed. Still we may confidently predict that consciousness at least will never give us these revelations touching itself. As Maudsley justly says, consciousness cannot be at once effect and cause—cannot be at once itself and its molecular antecedents: it lives for an instant only and cannot by a direct intuition turn back to its immediate physiological antecedents; and besides, to descend again to these material antecedents were to lay hold not of itself but of its cause.

It would be for the present chimerical to undertake to define even roughly the necessary and sufficient conditions of the apparition of consciousness. We know that the cerebral circulation, as regards the quantity and the quality of the blood, has a good deal to do with the case. Of this we have striking proof in experiments made on the heads of animals immediately after decapitation. So too we know that the duration of the nervous processes in the centers is an important point. Psychometric research daily shows that a state of consciousness takes longer time in proportion to its greater complexity, and that on the other hand automatic acts, whether primordial or acquired, the rapidity of which is extreme, do not enter the consciousness. It may also be affirmed that the apparition of conscious-

ness is connected with the period of the disassimilation of nerve tissue, as Herzen has shown in detail.* But all these results are but partial gains, while a scientific account of the genesis of a phenomenon requires a determination of *all* its essential conditions.

This the future will yield perhaps. In the mean time we shall best strengthen our hypothesis by showing that it alone explains one highly important character—and not merely a condition—of consciousness, namely its *intermittence*. To avoid all misunderstanding at the outset, be it noted that the question is not as to the discontinuity of states of consciousness with one another. Each has its limits which, while they allow it to be associated with others, preserve its own individuality. Not of this do we speak, but of the well known fact that consciousness has interruptions: in ordinary language, a man is not always thinking.

True it is, that this assertion has been contradicted by the majority of metaphysicians. But they have never furnished proof in support of their thesis; and, as all the facts apparently are against it, the burden of proof seems to lie upon its advocates. Their whole argument is in effect that since the soul is essentially a thing that thinks, consciousness must needs always exist in some degree, even though no trace of it subsists in the memory. But this is simply begging the question, for the hypothesis we maintain challenges their major premise. Their alleged proof is, after all, only an inference drawn from a contested hypothesis.

Let us put aside all *a priori* solutions and look at the question as it is in itself. Let us consider, not cases of syncope, artificial anæsthesia, epileptic vertigo, coma, etc., but the familiar and frequently occurring psychic state of sleep. It has been asserted that sleep is never dreamless; but that is a purely theoretic assertion, based on the thesis that the soul is ever thinking. The only fact that can be cited in support of this proposition is that sometimes a sleeper, when called or questioned, responds in suitable fashion, but on waking has no recollection of the occurrence. But this fact does not justify a general conclusion, and the theory of the metaphysicians is met by the physiologists with another. Physiology teaches us that the life of every organ comprises two periods, one of compara-

**La Condizione fisica della Coscienza.* Roma, 1879.

tive repose, or of assimilation, the other of activity, or of disassimilation; that the brain presents no exception to this law, and that experience shows the duration of sleep, in the several epochs and circumstances of life, to be in direct ratio to the need of assimilation. The cause of sleep is the necessity of repairing losses, of making the nutritive circulation succeed to the functional circulation. In wakefulness, the brain burns up more material than is given to it by the blood, so that oxidation soon grows less, and with it the excitability of the nerve tissue. Preyer's experiments show that sleep comes when, in consequence of prolonged activity, the substance of the brain, like that of a fatigued muscle, finds itself overloaded with a certain quantity of acid *detritus*. The very presence of these products arrests, at a given moment, the cerebral activity, which does not reappear till repose has allowed complete elimination of these waste matters.* It must be admitted that complete, absolute sleep, without any dream, is the exception; but that such sleep occurs, and that not rarely, is sufficient to establish the intermittent character of consciousness.

The physiological thesis possesses a probative value very different from, and much stronger than, that of the metaphysical thesis. And it must be remembered—an important point—that all those who have investigated the question whether there exists perfect cerebral sleep, are men of cultivated and active minds—psychologists, physicians, literary men—in whom the brain is ever wakeful, vibrating like a sensitive musical instrument in response to the slightest excitation: in them consciousness is a habit, so to speak. Those who put to themselves the question whether sleep is always accompanied by dreams, are, in fact, the ones least fitted to give a reply in the negative. Among hand workers, this is not the case. A farm-laborer living remote from all intellectual agitation, ever restricted to the same occupations, to the same routine, usually does not dream. I know several peasants who look on a dream as a rare occurrence in their hours of sleep.

“The most convincing proof that the mind can be completely inactive during sleep—that it can have its existence momentarily in-

terrupted or suspended—would indisputably be afforded if the instant of falling asleep should connect immediately with the instant of awaking, and if the intervening time should be as though it had not been. The philosophers who do not believe in perfect sleep have themselves pointed out this test, at the same time declaring that it has never been verified. But I have been witness of the fact under the following circumstances: One morning, at 2 o'clock, I was called to attend a person in the neighborhood attacked by cholera. As I was about to go out, my wife gave me some direction about the candle I held in my hand, and then fell asleep. I came back after about half an hour. The noise of the key turning in the lock as I opened the door, awakened my wife suddenly. So deep had been her sleep, so close was the conjunction of the moment when she fell asleep, with the moment when she was awakened, that she supposed she had not slept at all, and that she took the sound of the key upon my return, for the same sound at my going. Seeing me re-enter, she believed I was simply turning back on my steps, and asked me the reason; great was her astonishment on learning that I had been absent half an hour.” †

I know not how facts of this kind can be met, except by falling back upon the inevitable hypothesis of states of consciousness that have left no trace in the memory: but that hypothesis, I repeat, is gratuitous and improbable. Those who are subject to fits of swooning with loss of consciousness, know by experience that, while the fit is on, they may suffer a fall or contusion of a member, or overturn a chair, and, yet, on coming to themselves, have no idea of what has happened. Is it likely that these rather serious accidents, had they been accompanied by consciousness, would have left no memory lasting at least a few seconds. I do not in any wise deny that in certain circumstances, whether normal or morbid,—for instance, in hypnotism—states of consciousness that leave no trace apparent at the awakening, may later be recalled; I will restrict as much as any one may wish, the cases of complete interruption of consciousness; but one single case suffices to raise up insuperable difficulties against the hypothesis of the soul being substance which thinks. On the opposite hypothesis, all is easily explained. If consciousness is an occurrence depend-

* By absorbing a certain quantity of lactate of soda, taken as a type of disassimilation products in the brain, Preyer produced yawning, somnolence, and even sleep.

† Despine, *Psychologie Naturelle*, I., p. 522. Writers on insanity mention cases where, a pathological state suppressing consciousness abruptly, the patient, after a longer or shorter interval, resumes his conversation at the word where he had been stricken. See other facts of like nature in Winslow, *On Obscure Diseases*, etc., p. 322 et seq.

ent on determinate conditions, it need not surprise us if sometimes it is wanting.

Were this the place to discuss the question of consciousness thoroughly, we might show that on our hypothesis the relation of the conscious to the unconscious is no longer unsettled or contradictory. The term *unconscious* may always be expressed by this periphrasis: A physiological state which, though sometimes, and even most frequently it is accompanied by consciousness, or may have been so accompanied originally, is at present not accompanied by consciousness. This characterization, though negative as regards psychology, is positive as regards physiology. It declares that in every psychic happening the fundamental, active element, is the nervous process, and that the other is but concomitant. Consequently it is easy to see that all of the manifestations of psychic life may be unconscious and conscious by turns: for the former case there is required (and this suffices) a determinate nervous process, that is to say, the calling into action of a determinate number of nerve elements forming a determinate association, to the exclusion of all other nerve elements and of all other possible associations. For the second case it is required (and this suffices) that supplementary conditions of whatever kind be added, without changing aught in the nature of the phenomenon, save to render it conscious. And here we see how unconscious cerebration does so much work quietly, and how, oftentimes after protracted incubation, it manifests itself by unexpected results. Each state of consciousness represents only a very small part of our psychic life, for unconscious states ever underlie it and as it were thrust it forward. Every volition, for instance, has roots deep down in our being; the motives that accompany and apparently explain it are never more than a part of the true cause. So it is with many of our sympathies; and so evident is this fact, that minds most deficient in observation often wonder that they cannot account for their likes and dislikes.

It were tedious as well as needless to pursue this demonstration farther. Should the reader wish to do so he may consult, in Hartmann's *Philosophy of the Unconscious*, the section entitled "Phenomenology." There he will find classified all the manifestations of the mind's unconscious life, and he will see that there is not one fact that is not explained by the

hypothesis here maintained. Let him then apply to the same facts the other hypothesis.

One point more remains to be considered. The theory which regards consciousness as a phenomenon, and which springs (as could be shown were the digression allowable here) from that fundamental principle in physiology that "reflex action is the type of nerve action and the basis of all psychic activity," to many sound intellects appears paradoxical and irreverent. They think it robs psychology of all stability and dignity. They are loath to admit that all the highest manifestations of nature are instable, fleeting, superadded, and, as regards their conditions of existence, subordinate. But that is only a prejudice. Consciousness, whatever be its origin, and its nature, loses naught of its value; it is to be esteemed for what it is in itself; and for the one who takes the evolution point of view, it is not the origin that is of importance but the height attained. Experience too teaches us that as we ascend in the series, natural compounds are more and more complex and instable. Were stability to measure dignity the highest place would belong to minerals. This objection then, a purely sentimental one, is inadmissible. As for the difficulty of explaining on this hypothesis the unity and continuity of the conscious subject, it is not yet time to speak of it. It will be considered in due course.

But the hypothesis of consciousness as phenomenon has a weak side: its sincerest partisans have maintained it under a form that has won for them the title of advocates of absolute automatism. They are wont to compare consciousness to a ray of light from the furnace of a steam-engine that lights up the machine but has no effect whatever on its work; according to them consciousness has no more action than the shadow that accompanies the wayfarer's steps. If these similes have no purpose save to express the doctrine in a telling way, there is nothing to say; but taken in their strict sense they are exaggerated and inexact. Consciousness in itself and by itself is a new factor; and in this there is nothing mystical nor supernatural, as we shall see.

In the first place, from the hypothesis itself, a state of consciousness supposing a greater number of physiological conditions (or at least different ones) than

does the same state when it remains unconscious, it follows that two individuals, one of them in the former state, the other in the latter, are not, other things being equal, strictly comparable.

Stronger proofs still remain—not logical deductions but facts. When a physiological state is become a state of consciousness, it thereby acquires a special character. Before, it had relation to space, and could be conceived of as the calling into action of a certain number of nerve elements occupying a determinate superficies: but now it takes a position in *time*—comes after this, follows that, whereas for unconscious states there is neither before nor after. It now is capable of being recalled, *i. e.*, recognized as having occupied a definite position among other states of consciousness. Hence it is become a new factor in the individual's psychic life, a result that may serve as a starting point for some new work whether conscious or unconscious; and so far is it from being the product of a supernatural operation that at bottom it is simply a case of that organic registration which underlies all memory.

To reach greater clearness let us take a few examples. Volition is always a state of consciousness: it says that a thing should be done or prevented. It is the final and definite result of a multitude of states, conscious, semi-conscious, and unconscious; but once affirmed, the volition becomes in the individual's life a new factor. The resolution taken marks a sequence, and it is capable of being recommenced, or modified, or inhibited. Automatic acts unaccompanied by consciousness do not admit of anything like this. Novelists and poets, accurate observers of human nature, have often noted the situation where a passion—love or hate—after lying for a long time latent and unconscious, at last comes to the light, assumes definite form, becomes conscious. Its character is then changed; it acquires increased intensity, or it is overpowered by other antagonistic passions. Here again consciousness is a new factor that has modified the psychological situation. Take another example. One may by instinct, that is by unconscious cerebration, solve a problem, yet quite possibly at another time he may be stalled by a similar problem. If on the other hand the solution is reached through conscious reasoning, difficulty with the second problem is far less probable, for each step forward is a new position won, and thereafter we no longer walk as blind. But this in no

wise belittles the part played in invention and discovery by the unconscious work of the brain.

These examples, taken at random, suffice to show that the similes mentioned above are true with respect to every state of consciousness *in itself*. It is indeed in itself only a light that makes visible unconscious work: but viewed in its relation to the future development of the individual it is a factor of the highest importance.

And what is true of the individual is true also of the species and of the succession of species. Considered merely with reference to the survival of the fittest, and quite apart from all psychological considerations, the apparition of consciousness upon the earth was an event of prime consequence. Thereby was made possible for the animal world experience, *i. e.*, a higher order of adaptation. Wherein consciousness had its origin we need not inquire. Some highly ingenious hypotheses have been put forward upon the subject—hypotheses that enter the domain of metaphysics—but these experimental psychology need not discuss, for it assumes consciousness as a datum. It is probable that consciousness, like every other manifestation of life, first made its appearance in a rudimentary form, and seemingly with poor endowment. But when it had become capable of establishing in the animal a memory in the psychic sense, so enabling it to bank upon its past for the benefit of the future, there was a new chance of survival. To unconscious, blind, accidental adaptation, dependent on the environment, there was added a conscious, coherent adaptation dependent on the animal itself, and more steady and more rapid than the other: it curtailed the labor of selection.

The part of consciousness, then, in the development of psychic life is plain. I have dwelt upon this point because the supporters of the hypothesis here maintained have usually studied consciousness only as it actually exists, not noting sufficiently the result of its apparition. They rightly say that it illumines, but they have not shown that it brings something additional. Consciousness, I repeat, is in itself only phenomenon, an accompaniment. If there exist animals in which consciousness appears and disappears every moment, leaving no trace, these are mental automata in the strictest sense: but if the state of consciousness leaves a residuum, an enregistration in the organism, then it acts not only as an indicator but as a con-

densator; and the metaphor of the automaton is no longer valid. This admitted, many of the objections to the theory of consciousness as a phenomenon fall to the ground.

CHAPTER II.

ORGANIC DISTURBANCE.

I SHALL treat at length of the organic conditions of personality, for on these all depends and these explain all the rest. Metaphysical psychology has hardly taken any notice of them, therein showing logical consistency, for in its view the Me comes from above not from beneath. We on the other hand must seek the elements of personality in the most elemental phenomena of life: these confer upon it its distinctive character. The "organic sense," the "sense of the body"—a sense with us vague and obscure generally, though at times very well defined—is for each animal the basis of its psychical individuality.* This is that "principle of individuation" so much sought after by the scholastic philosophers, for on it directly or indirectly all depends. It may be regarded as highly probable that as we descend toward the lower animals, the organic sense becomes more and more dominant till it becomes the whole psychic individuality. But in man and in the higher animals the bustling world of desires, passions, perceptions, images, ideas, overlies this voiceless deep: save at intervals we forget it because we ignore it. It is as with facts of the social order. The millions of human beings that make up a great nation are for itself and the rest of the world reduced to a few thousand men who, so to speak, are its clear consciousness, and who represent its social activity in every phase—political, industrial, commercial, intellectual. Still it is the millions of common people, ignored, leading a narrow, local life, living and dying unnoticed, that constitute the nation's mass: without them it is nothing. They are the inexhaustible reserve out of which, by natural selection,

a few emerge, rising to the surface, but these, however endowed with talent, power, or wealth, have only an ephemeral existence. The degenerescence naturally inherent in whatever rises above the general level will lower them or their descendants, while the mute toil of the millions who live ignored will continue to produce others and to imprint a character upon them.

Metaphysical psychology notes only the summits of the prospect, and inner observation has but little to tell of what takes place within the body; hence the study of the general sensibility has been from the first the special work of physiologists.

Henle (1840) thus defines general sensibility, or "cœnæsthesis": It is, he says, "the *tonus* of the nerves of sensation, or the perception of the state of activity in which these nerves constantly exist, even at moments when no impression from without is acting upon them." "It is," says he in another place, "the sum, the indiscriminated chaos of the sensations that are continually coming into the sensorium from all parts of the body." † E. H. Weber, with greater precision, defines cœnæsthesis to be an inner sensibility, an inner touch, which informs the sensorium of the mechanical and chemico-organic state of the skin, the mucous and serous membranes, the viscera, the muscles, the joints.

Louis Peisse, a physician and a philosopher, was the first man in France to combat the teaching of Jouffroy who held that we know not our own bodies save objectively, as an extended, solid mass like all other bodies; lying outside of the Me, and alien to the percipient subject as any strictly external object might be—as a table or a chair. Peisse showed, though rather timidly, that our knowledge of our own bodies is above all subjective. His description of this organic consciousness seems to me so exact that I quote it entire.

"Is it true" he says, "that we have absolutely no consciousness of the exercise of the organic functions? If you mean clear, distinct, locally determinable consciousness, like our consciousness of external impressions, plainly it is lacking: but we may have a faint, indistinct, so to speak, a latent, consciousness of it; for instance such a consciousness as we have of the sensations that call forth and accompany the respiratory movements—

* It may be remarked in passing that a great metaphysician, Spinoza, clearly maintains the same thesis, though in different terms. "The object of the idea that constitutes the human soul is the body. . . and nothing but the body."—"The idea which constitutes the formal being of the human soul is not simple but made up of many ideas." *Ethics*, Part II., Props. 13 and 15.

† *Pathologische Untersuchungen*, p. 114. *Allgemeine Anatomie*, p. 728.

sensations which though continually repeated pass unnoticed as it were. May we not indeed regard as a distant, faint, confused echo of the general vital work the peculiar feeling which continuously and unremittingly makes us aware of the presence and actual existence of our own body? This feeling has nearly always, but erroneously, been confounded with the chance local impressions which during wakefulness arouse, stimulate, and keep up the action of the sensibility. These sensations, though incessant, appear but for a moment on the stage of consciousness and pass away, whereas the feeling of which we speak endures and persists beneath this shifting scenery. Condillac properly enough called it 'the fundamental feeling of existence,' and Maine de Biran the feeling of sensitive existence. Through it the body is ever present to the Me as *its own*, through it the spiritual subject feels and knows itself to exist in some sort locally in the limited extension of the organism. It is a never-failing remembrancer, rendering the state of the body ever present to consciousness; thus does it most clearly show the indissoluble tie between psychic and physiological life. In the ordinary state of equilibrium which constitutes perfect health this feeling is continuous, uniform, and always equable; and just because it is thus continuous, uniform and equable it does not enter the Me as a distinct specific, local sensation. In order to be distinctly noted, it must gain a certain intensity; then it expresses itself by a vague impression of general well-being or general discomfort, the former state indicating a simple exaltation of physiological vital action, the latter betraying a pathological perversion of the vital economy, but in this case it soon becomes localized in the shape of particular sensations referred to one or another part of the body. Sometimes it manifests itself in a more indirect way, yet far more clearly, when it chances to fail at any given point in the organism, as for example in a member stricken by paralysis. The stricken member still belongs by nature to the living aggregate, but it is no longer within the sphere of the organic Me, if we may use that phrase. This Me no longer perceives it as its own, and the fact of this separation, though negative, is the object of a special positive sensation familiar to every one that knows what it is to suffer total numbness in any part of the body, as a result of cold or of compression of the nerves. This sensation is nothing else but the expression of a break in the general feeling of the bodily life: it shows that the vital state of the member was really, though obscurely, felt, and that it constituted one of the partial elements of the general feeling of the entire organism's life. A continuous, monotonous noise, as that made by a wagon in which one is riding, is not noticed though constantly heard; for should it cease abruptly its cessation would be noted instantly. The analogy may enable us to understand the nature

and characteristics of the fundamental feeling of organic life, which on this hypothesis would be simply the resultant *in confuso* of the impressions produced at every point of the living organism by the action of the several physiological functions, these impressions being carried to the brain either directly by the cerebro-spinal nerves, or indirectly by the nerves of the ganglionic system." *

Since the publication of these views (1844) physiologists and psychologists have been studying the elements of this general sense of the body. They have determined what contribution is made to the result by each vital function; they have shown how complex this confused sense of life is which by incessant repetition is become our own selves, so that to examine into it is to examine into ourselves. But we know it only through the variations that lift it above the normal tone or lower it beneath the same. In special treatises may be found full details of these vital functions and their psychic bearings; such details are not called for here, and it suffices if I give a very general view of them.

First we have the organic sensations connected with respiration, the sense of well-being produced by a pure atmosphere, of suffocation in confined air; then the sensations that come from the alimentary canal; and others, that are still more general, connected with the state of the nutrition. Hunger and thirst, for example, appearances to the contrary notwithstanding, have no precise local seat: they result from a feeling of discomfort diffused throughout the entire organism: the impoverished blood is craving something. And as regards thirst in particular, Claude Bernard's experiments have shown that it comes of a lack of water in the organism, not from dryness of the pharynx. Of all the functions, the general and local circulation is perhaps the one whose psychological influence is greatest, and whose variations between individuals and at successive moments in the same individual are most striking. Then consider the organic sensations resulting from the state of the muscles—the sense of fatigue and exhaustion, or the reverse; finally, those muscular sensations which, being associated with the external sensations of sight and touch, play so large a part in our cognitions. In fact the muscular sensibility, in its purely subjective form,

* Note to his edition of Cabanis's *Rapports du Physique et du Moral*, pp. 108, 109.

by itself alone makes known to us the degree of contraction or relaxation of the muscles, the position of our members, etc. I purposely omit the organic sensations of the genital apparatus: to that subject we will return in treating of the affective bases of personality.

Let the reader for a moment consider the multitude and the diversity of the vital actions just now summarily classed under their most general heads, and he will form some conception of what is meant by the phrase "physical bases of personality." Being ever in action, they make up by their continuousness for their weakness as psychic elements. And then too, when the higher forms of the mental life disappear, these organic sensations come forward in the first rank. A very clear instance of this is found in dreams, whether pleasurable or otherwise, prompted by the organic sensations—erotic dreams, nightmare, etc. We are even able to assign with some degree of precision to each organ its special part in dreams: the sensation of weight seems specially attached to digestive and respiratory affections; dreams of struggling and fighting accompany affections of the heart. Sometimes pathological sensations, unnoticed in wakefulness, make their impression during sleep, and thus become premonitory symptoms. Armand de Villeneuve dreams that he is bitten on the leg by a dog: a few days after, the leg is attacked by a cancerous ulcer. Gessner imagines during sleep that he is bitten on the left side by a serpent: shortly afterward, an anthrax appeared at the same spot, from which he died. Macario dreams that he has a violent pain in the throat, but awakes entirely well; a few hours later he was suffering from a severe amygdalitis. A man sees in his dream an epileptic: a little while later he has an attack of epilepsy. A woman dreams of speaking to a man who cannot make her any reply, being dumb: on awaking she could not speak a word. In all these cases we recognize as facts the obscure beckonings from the depths of the organism to the nerve centers; but the conscious life, with its hubbub and its constant bustle, suppresses instead of developing them.

It is plain that psychology, by giving exclusive credit for so long a time to the data of consciousness, must needs have cast into the shade the organic elements of personality: physicians, on the other hand, were under a professional obligation to give weight to the latter. The

doctrine of temperaments, as ancient as medicine itself, a doctrine that is ever criticised, ever worked over again,* is the vague, fluctuating expression of the principal types of the physical personality, as given by experience, with the chief psychic traits that result from it. Hence the few psychologists who have studied the several types of character have looked here for their basis. Thus did Kant more than a century ago. If the determination of the temperaments could be made on a scientific basis, the question of personality would be greatly simplified. In the mean time, the first thing to do is to rid ourselves of the preconceived opinion that personality is something mysterious, heaven-descended, without antecedents in nature. If we simply consider the animals around us, we shall have no difficulty in seeing that the difference between the horse and the mule, the goose and the duck, their "principle of individuation," can come only out of a difference of organization and of adaptation to environment, with the psychic consequences thence resulting, and that, within the same species, the differences between one individual and another must have come about originally in the same way. There is no reason in the nature of things for classing man separately: the simple fact is that in man the very great development of the intellectual and affective faculties produces an illusion and conceals the fact of origination.

Taking physical personality to mean simply a sense of the state of the organism—a mode of existence in which, on the hypothesis, all consciousness, clear or obscure, original or recalled, of any outer fact is absent, we ask, Does such a thing exist in nature? Clearly not in the higher animals; and it can be posited only as a highly artificial abstraction. But it is probable that this form of psychic individuality, which is simply the consciousness the animal has of its own body, exists in the lower species, though not in the lowest.

In the lowest species—instance any

* Quite recently Henle (*Anthropologische Vorträge* [1887], pp. 103, 120) has endeavored to refer the temperaments to the different degrees of activity, or *tonus*, of the sensorial and motor nerves. When this degree is a low one, we have the phlegmatic temperament. In a higher degree, with rapid exhaustion of the nerves, we have the sanguineous temperament. The choleric temperament also presupposes a high *tonus*, but with persistence of nervous action. The melancholic temperament can only be defined by the quantity of the nervous action: it presupposes a high *tonus* with a tendency to emotions rather than to will activity.

multicellular organism composed of cells that are all alike—the constitution of the organism is so homogeneous that each several element lives for itself, and each has its own action and reaction. But their sum no more represents an individual than six horses drawing a wagon constitute one horse. There is neither coördination nor *consensus*, but only juxtaposition in space. If, as many authors do, we were to give to each cell the analogon of a consciousness (which would be only the psychic expression of its irritability) we should then have consciousness in the state of complete diffusion. Between the elements there would be an impenetrability which would leave the whole mass in the state of living matter without even external unity.

But higher in the animal scale, for instance in the Hydra, observation finds a certain *consensus* among the actions and reactions and a certain division of labor. Still the individuality is highly precarious: Trembley cut one hydra into fifty individuals. But inversely two hydras may be made into one: it is only necessary to turn the smaller one inside out and then thrust it into the larger, so that the two endoderms may come into contact and grow together. As far as one may venture an opinion on so obscure a subject, the adaptation of movements denotes a certain unity, temporary, instable, at the mercy of circumstances, it may be, but probably not without some faint consciousness of the organism. If still we are observing too low a stage of animal life, we may at pleasure go higher to find the point where the creature has simply a consciousness of its organism—organic consciousness. Even this form of consciousness probably does not exist in its purity, for as soon as the rudiments of special senses appear, the animal rises above the level of general sensibility; and besides, is general sensibility of itself enough to constitute a consciousness? We know that the human fœtus makes efforts to free itself from an inconvenient position, from the impression of cold, from painful irritation; but are these movements unconscious reflex actions?

But I haste to quit these conjectures. The undisputed fact is that organic consciousness (*i.e.* the animal's consciousness of its body and of nought but its body) is vastly preponderant in the greater part of the animal world; that it is in the inverse ratio to the higher psychic development; and that everywhere and always this consciousness of the organism is the

basis on which individuality rests. In virtue of it the whole structure stands: without it the structure is nought. The contrary thesis is unintelligible, for is it not through the organism that we receive external impressions, the *materia prima* of all mental life? And what is more, is it not upon it that we find inscribed and fixed by heredity, how we know not, yet, as facts prove, in characters indelible, the instincts, feelings, aptitudes peculiar to each species, to each individual?

If then it be confessed that the organic sensations coming from the tissues, from all the organs, from all the organic movements, in short from all the bodily states, are, in whatever form, in whatever fashion represented in the sensorium, and if the psychic personality is simply their sum, it follows that, like them and with them, the personality must vary, and that these variations range through all possible degrees, from simple indisposition [*malaise*] to total metamorphosis of the individual. The phenomenon of "double personality" which has made such a noise—and I shall treat of it later—is only an extreme instance. Granted sufficient patience and sufficient research, and we should find in mental pathology plenty of observations to prove a progression, or rather a continuous regression from the merest passing change to the most complete transformation of the Me. The Me exists only on the condition that it vary continually: that point is not disputed. As for its identity, that is only a question of number: it persists so long as the sum of the states that remain relatively fixed is greater than the sum of the states added to or taken from this stable group.

At present we have to study only disorders of personality directly connected with the organic sensations, and since in itself general sensibility possesses but an inconsiderable psychic value, it produces only partial disorders, except when the transformation is total or sudden.

We begin with the consideration of a state hardly to be called morbid, a state probably familiar to every one: the feeling of exaltation or of depression which comes upon a person without known cause. The habitual tone of the individual changes: it rises or falls. In the normal state there is a positive "euphoria": there is neither bodily satisfaction nor bodily indisposition. At times, on the other hand, the vital functions are in a higher tone: there is unwonted or-

ganic activity which seeks to expend itself; every enterprise seems easy, every scheme promising. This state of satisfaction, at first purely physical, becomes diffused over the whole nervous organization, summoning up a host of pleasurable feelings to the exclusion of whatever displeases. The subject sees everything in a rosy light. Again the reverse condition obtains: a state of indisposition, depression, inertia and helplessness, and consequent upon this a feeling of gloom, apprehension, downheartedness. The man sees nothing to cheer him. But in neither case has anything occurred, any influence come from without that might account either for the gladness or for the gloom.

Assuredly we may not affirm that the personality has been transformed in the strict sense of the term. It has been transformed relatively. For himself and still more for those who know him, the individual is changed, is no longer the same. Translated into the language of analytical psychology, this means that his personality is made up of elements, some of them relatively stable, the others variable; and that the variable elements having overpassed considerably their habitual limit, the stable elements assume a lower ratio to the whole, without disappearing.

Now suppose—and the supposition is realized every day—that this change, instead of passing away after a little while, and giving place to the normal state, itself persists: in other words, suppose the physical causes that produce it to be permanent instead of being transitory; then there results a new physical and mental habitude, and the individual's center of gravity tends to displacement.

This first change may lead to other changes so that the transformation shall go on increasing. At present I will not dwell upon this: my wish was simply to show how from a very common physical and psychic state it is possible to descend little by little to complete transformation. It is only a question of degrees.

In studying the disorders of personality it is impossible rigorously to determine those which have their *direct* cause in perturbations of the general sensibility, for the latter often, by their secondary action, summon up psychic states of a higher order—hallucinations, and morbid feelings and thoughts. I shall limit myself to cases in which disorders of the general sensibility seem to be predominant.

In the *Annales Médico-psychologiques* (Sept. 1878) we find recorded five observations grouped under one heading: "An aberration of physical personality." Without caviling at the title, which perhaps says more than it ought to say, we see here an unknown organic state, a change of the *cœnæsthesis* producing, in the absence of all external causes, a feeling of bodily annihilation. "While in the enjoyment of perfect health, with exuberant strength and vitality, a person experiences a sensation of ever increasing weakness, so that he apprehends every moment that he is about to fall into syncope, and to be extinguished." Meanwhile the sensibility is intact; the patient eats with a good appetite; and if any one attempts to act contrary to his will, he reacts with the utmost energy. He keeps repeating that he feels himself dying, his light going out little by little; that he has not more than a few hours of life left. Naturally upon this purely physical stock delirious conceptions become engrafted: one patient declares that he is poisoned, another that a demon has entered his body and "is sucking the life out of him."

Let us fix our attention upon the immediate consequences of the physical state. We find here that state of depression already described and familiar to every one, but in a far more serious and more stable form. The mental disorder increases equally and becomes systematized. The individual becomes more and more unlike his former self. Another stage is reached on the road to the break-up of the *Me*, but dissolution is still a long way off.

This beginning of transformation, resulting from natural causes, is seen also in patients who say that they are enveloped with a veil or with a cloud; that they are cut off from the outer world, and insensible to everything. Others—and in their case the phenomena may be referred to disordered muscular sensibility—enjoy with rapture the lightness of their bodies, feel themselves suspended in air, fancy that they can fly; or they have a sense of weight throughout the whole body or in some of their members, or in one, and that one they imagine to be of enormous size and weight. "A certain young epileptic at times felt his body so uncommonly heavy that he could hardly support its weight: again it was so light that he fancied he did not touch the ground. Sometimes his body seemed to him to have assumed such proportions

that no doorway was wide enough to afford him passage."*

Patients subject to illusions regarding the size of their bodies may fancy them to be either very much larger, or very much smaller than, they are.

The *local* perversions of the general sensibility, though by nature restricted, are nevertheless of great importance psychologically. A patient will assert that he no longer has any teeth, or that he has no mouth, stomach, intestines, brain, etc. This state can be explained only by a suppression or an alteration of the inward sensations that exist in the normal state, and which go to make up the conception of the physical Me. To the same cause, sometimes conjoined with cutaneous anæsthesia, are to be referred cases where the patient believes that some one of his members or even that his whole body is wood, or glass, or stone, or butter, etc.

A little later he will be saying that he now has no body, that he is dead. Esquirol tells of a woman who believed that the Devil had carried her body away: in her the cutaneous surface was totally insensible. The physician Baudelocque, toward the end of his life, was unconscious of the existence of his body. He used to say that he had no head, no arms, etc. Finally, every one is familiar with the fact recorded by Foville: A certain soldier who had been severely wounded in the battle of Austerlitz ever afterward believed himself dead. On being asked what was the news he would answer, "You wish to know how is old Lambert? He is no more, a cannon ball put an end to him. What you see is not Lambert, but a clumsy machine made to resemble him. You must ask them to make another." In speaking of himself he never said "*moi*" (I, me) but "*cela*" (this thing). The skin was insensible, and he oftentimes would fall into a state of utter insensibility and immobility lasting for several days.

Here we come to grave disorders, meeting for the first time a double personality, or more strictly a discontinuity between two periods of psychic life, a failure of them to connect. The case just mentioned may be explained thus: Before his injury, this soldier, like every one, had his organic consciousness, the sense of his own body, of his physical personality. After it, an essential

change took place in his nervous organization. As regards the nature of this change unfortunately we can only offer hypotheses; the effects alone are known to us. Whatever the change may have been its result was to produce another organic consciousness, the consciousness of a "clumsy machine." Between this and the former consciousness, memory of which persisted tenaciously, no connection had been established. The feeling of identity was wanting because, as regards organic as well as other states, it can result only from a slow, progressive and continuous assimilation of the new states. In this case the new states did not enter the former Me as an integral part. Hence the odd situation, in which the former personality appears to itself as having been but now no longer existent; and in which the present state appears as something external and foreign. Finally I would remark that in states where the surface of the body is no longer sensitive; where sensations coming from the several organs are nearly null, and the superficial and the deeper sensibility is extinct, the organism no longer calls up those feelings, images and ideas which are its bond of union with the higher psychic life: it is restricted to the automatic actions that constitute the habitude and routine of life. It is properly speaking "a machine."

Should any one maintain that in this instance the only personality is that which remembers, he may do so absolutely, but it must be admitted that this personality is of a very peculiar kind, existing only in the past: hence it might be called more properly a memory than a personality.

What distinguishes this case from those we shall consider later is that here the aberration is entirely physical: it has its rise in the body, and it refers only to the body. This old soldier does not believe himself to be some one else (Napoleon, for instance, though he was at Austerlitz): the case is as free as possible from mental elements.

To perturbations of sensibility is also to be referred the illusion of some patients or convalescents who fancy themselves to be double. Sometimes there is illusion pure and simple without duplication. In that case the morbid state is projected outside of the patient—he alienates a part of his physical personality. Instances of this illusion are seen in cases like that recorded by Bouillaud

* Griesinger, *Traité des Maladies Mentales*, p. 92. Doumic's translation.

where the patient having lost sensibility on one side of the body, imagines that he has lying beside him on the bed another person, or even a dead body. But when the group of morbid organic sensations, instead of being thus alienated, cling to the normal organic personality, but without fusion, then and so long as that state lasts, the patient believes that he has two bodies. "A man convalescing after a fever believed himself to be made up of two individuals, one abed, the other walking about. Though he had no appetite, he ate a good deal, having, as he said, two bodies to feed."*

"Pariset having in his early years been prostrated by epidemic typhus, remained several days in a state of collapse nigh to death. One morning a more distinct sense of himself awoke within him; he fell a thinking, and it was like a resurrection from the dead. But, strange to tell, he had at that moment, or believed that he had, two bodies, which appeared to him to be lying in two separate beds. While his soul was present in one of these bodies, he felt well and enjoyed a delightful repose. In the other body the soul endured the suffering incident to the disease, and the patient would say, How is it that I am so easy in this bed and so ill, so wretched in the other? These thoughts engaged his mind for a long time, and with his extraordinary power of psychological analysis he oftentimes entertained me with the details of the impressions he then received."†

Here we have two instances of double *physical* personality. Though we are still but a little way on in our study, the reader may already see how these cases differ from one another when closely examined. The current phrase "double personality" is only an abstraction: once translated into the language of concrete facts, of authentic observations, it is seen to comprise all sorts of diversity. Each case, so to speak, requires a special interpretation. *A priori*, the special interpretation might be found. If, as we hold and as we will try to show as we proceed, personality is a highly complex composite, plainly its perturbations must needs be multiform. Each separate case shows it to us broken up in a different way. Here disease becomes a subtle instrument of analysis; it makes for us experiments not to be had otherwise. The difficulty is to in-

terpret them aright; but our very mistakes can lead us astray only for a moment, for the facts the future will develop will serve to correct our conclusions or to verify them.

The province of the physical personality as an element of the total personality is so important a one and has been so overlooked, often on purpose, that we can hardly lay too much stress upon it. Here we may with some advantage study certain rare cases little regarded by psychologists, but which bring to the support of our thesis some additional facts not more conclusive than those already cited, but more striking: I mean cases of double monsters.

It must be confessed that the number of such cases is rather small. Nature does not multiply monsters, and of the seventy or eighty species defined by teratologists the major part have no interest for us. Furthermore, of double monsters many fail to reach adult age. The anatomist and the physiologist may study these with profit, not so the psychologist. Finally, accurate observations on this matter date back hardly one hundred years. Observations of an earlier date are so tinged with credulity and so imperfectly recorded as to be of no value.

The Me, as has oft been repeated, is impenetrable: it forms in itself a perfect whole strictly limited—and this is a proof of its essential oneness. This statement is indisputable, nevertheless the impenetrability of the Me is only the subjective expression of the impenetrability of the organism. One personality cannot be another personality, just because one organism cannot be another organism. But if through a concurrence of causes that need not be enumerated, two human beings from the foetal period be partially united, the heads—the essential organs of human individuality—remaining perfectly distinct, then what happens is this: each organism is no longer completely limited in space and distinct from every other; there is an undivided ownership, common to both, of a part of the economy, and if, as we maintain, the unity and the complexity of the Me are but the subjective expression of the unity and the complexity of the organism, then there must be partial penetration of one personality by the other, and a portion of the common psychic life must be common to the two, belonging not to a Me

* Leuret, *Fragments Psychologiques sur la Folie*, p. 95.

† Gratiolet, *Anatomie Comparée du Système Nerveux*, tome 2, p. 548.

but to a *We*. Each individual here is a little less than an individual. This inference is fully confirmed by experience.

"Anatomically considered, a double monster is always more than a unitary individual and less than two, but in some cases it comes nearer to unity, in others to duality. So too, physiologically considered, it always has more than a unitary life, and less than two lives; but its twofold life may approach nearer to unity on the one hand or on the other to duality.

"If we consider only the phenomena of sensibility and of will, a monster made up of two nearly perfect individuals joined only at one point of their bodies will be twain mentally and morally as well as physically. Each individual will have its own sensibility and its own will, and these will have relation to its own body and to that alone. It may even happen that the twins will differ widely in their physical constitution, their stature, their physiognomy, and not less widely in personal character and intelligence. When one is happy the other may be sad; one will be wakeful while the other sleeps; or one will want to walk while the other prefers to rest: and out of this conflict of two wills governing two indissolubly united bodies may come movements without results and that are neither walking nor resting. The two moieties may quarrel with each other, or come to blows. . . . Thus their moral duality, a consequence of their physical duality, will be demonstrated in a hundred ways; nevertheless, as there is a point in the double body situate on the dividing line between the two individuals and common to both, certain other phenomena not so numerous, demonstrate in them a beginning of unity.

"Impressions made upon the region where the two are united, especially at its central point, are perceived simultaneously by both brains, and both, too, may react in response to them. . . . We may add that if at times the peace between the twins is disturbed, there exists between them nearly always a harmony of feelings and desires and a mutual sympathy and attachment that can hardly be appreciated by one who has not read all the testimony.

"Phenomena of the same and of a different kind are seen in cases where, the union becoming closer, the two heads have between them only one body and one pair of legs. Anatomic analysis shows that in such creatures each individual possesses as his own one side of the one body and one of the two legs. Physiological and psychological observation fully confirms this singular result. Impressions made along the whole length of the axis of union are perceived simultaneously by both the heads; those made on either side of the axis and at some distance from it are perceived by one head only; and the same is true of the will as of sensations. The brain to the right will alone receive sensations through the right leg and it alone will

act upon that leg, while the brain to the left will alone act on the left leg: so that the act of walking will be the result of movements performed by two limbs belonging to two different individuals, and coördinated by two distinct wills.

"Finally, in parasital monsters, as the organization is here nearly unitary, all the vital acts, all the sensations, all the manifestations of will take place almost exactly as in normal beings. The smaller of the two individuals, having become an accessory and inactive part of the larger, exerts upon him only a weak and limited influence and that only in a very small number of functions."*

To these general outlines I will add a few details taken from the most famous instances of double monstrosity.

There are a good many documents extant relating to Helen and Judith, a dual female monster born at Szony, Hungary, in 1701, deceased at Presburg aged twenty-two years. Helen and Judith stood nearly back to back, being united at the nates and partly in the lumbar region. The sexual organs were double externally, but there was only one womb; there were two intestinal canals opening into one anus. The two aortas and the two inferior venæ cavæ were united at their extremities, thus opening two wide and direct communications between the two hearts: from this resulted a semi-community of life and function.

"The sisters had neither the same temperament nor the same character. Helen was taller, handsomer, more sprightly, more intelligent and more amiable in disposition than her sister. Judith, stricken at the age of six years with hemiplegic paralysis, was always smaller and of less active mind. She was slightly deformed, and her speech somewhat impeded. Still, like her sister, she spoke the Hungarian, German, French, and even a little English and Italian. The sisters were tenderly affectionate to each other, though in childhood they sometimes quarreled and even came to blows. The calls of nature came to both simultaneously, except as regarded urination. They had the measles and later the small-pox simultaneously, and whenever it happened that only one of the sisters was ill of any complaint, the other would be miserable and worried. At last Judith was taken with a brain trouble and an affection of the lungs. Helen, who for a few days had suffered from a slight fever, almost instantly lost all her strength, though her intellect remained clear and her power of speech unimpaired. After a brief agony she

* Isidore Geoffroy Saint-Hilaire, *Histoire des Anomalies*, tome 3, p. 373. The monster known as "Home's epicome," had a parasitic head which presented but a very imperfect semblance of normal life.

succumbed, not to her own ailment but to those of her sister. The twins expired at the same instant."

The Siamese Twins, Chang and Eng, born in 1811 in the kingdom of Siam, were connected from the navel to the xiphoid appendix. I. G. de Saint-Hilaire, after describing their outward *habitus*, adds that,

"The two brothers, even in their other functions [besides respiration and the arterial pulsation] exhibit a concordance that is remarkable, though not absolutely constant as has been affirmed, and as Chang and Eng themselves have been wont to assure those who went no farther than to put to the twins a few vague questions. No doubt there is nothing more curious than the contrast of almost complete physical duality with absolute moral unity—but there is nothing so opposed to sound theory. I have carefully made every observation, and gathered all the information that could help me to determine the truth of what has been so often asserted, and I have found that, in this conflict between the ill-understood principles of teratology and the many physiological doctrines that have been based on the unity of the Siamese brothers, the facts, as was to have been expected, are entirely in favor of the former. These twin brothers, cast in two nearly identical moulds, of necessity subject throughout their lives to the influence of the same physical and moral environment, having a similar organization and receiving the same education, present the spectacle of two creatures whose functions, actions, words, whose very thoughts are nearly always concordant and parallel. . . . Their joys, their sorrows, are in common: the same desires arise at the same instant in these twin souls, the sentence that is begun by one is often completed by the other. Nevertheless these concordances prove parity, not unity. Twins in the normal state often exhibit analogous concordances, and no doubt they would present agreements quite as remarkable if they had during their whole lives seen the same objects, experienced the same sensations, shared in the same pleasures, undergone the same sufferings."*

And I may add that as the Siamese twins grew older, their differences of character became more and more pronounced: one of the latest observers describes one of the brothers as morose and taciturn, the other as sprightly and cheerful.

Inasmuch as the present work is not intended to be a Psychology of Double Monsters, which find a place in this

treatise only as instances of deviation of personal identity, I shall simply mention the recent case of Millie and Christine, in whom the sensibility of the lower members is in common; consequently the two spinal cords must form a regular chiasma at the point of union.

The law, both civil and ecclesiastical, takes cognizance of this phenomenon of double monsters, as involving questions of civil status, marriage, right of succession, baptism, etc.; it has unhesitatingly recognized two persons wherever such monsters present two distinct heads. And justly so, though in practice embarrassing questions may arise. The head being in man the true seat of personality and the place where the synthesis of personality takes place—though this does not appear so certain as we descend the animal scale—it fairly stands for the individual. But when the question is discussed scientifically it is impossible, in the case of double monsters, to consider each individual as complete.

I will not weary the reader with unnecessary comments, since the facts speak for themselves. Whoever examines attentively what has been said, will see that even in cases where the personalities are most distinct, there is such a blending of organs and functions that each of the twins can be himself only by being more or less the other and by having consciousness of that other.

The Me therefore is not an entity that acts where and how it pleases, controlling the organs in its own way, limiting its own province at will. On the contrary it is so truly a resultant that its domain is strictly determined by its anatomical connections with the brain, and that it represents, now a complete body less some undivided part, again a part of a body and, in the case of parasitical monsters, so small a part that it cannot subsist, and becomes aborted.

To prove once more and in another way that the organism is the principle of individuation; and that it is such without any restriction, directly through the organic sensations, indirectly through the affective and intellectual states of which we shall speak later; let us see what takes place in twins. Psychology has hardly concerned itself about twins any more than about double monsters, but biologists have brought to light some curious facts.

First it is to be remarked that double

* *Hist. des Anomalies*, tome 3, p. 90, et seq.

births occur in the ratio of about one to seventy normal births. Triple and quadruple births are far more infrequent—as one to 5000 and one to 150,000 respectively: but we will consider here only cases of twin births, for the study of triple and quadruple births would only complicate matters. Again, it is to be remarked that there are two kinds of twins, coming each from a separate ovum, and in such cases they may be of the same or of different sex; or from two germinative spots in one ovum, and then they are enveloped in the same membrane and are invariably of one sex. This latter case alone gives us two personalities strictly comparable.

We will not take account of animals, but will consider the human species only, and will attack the problem in all its complexity. It is evident that since the physical and the moral state of the parents is the same for the two individuals at the instant of procreation, one cause of difference is eliminated. And as their development has for its starting point one single fecundated ovum, it is highly probable that there will be an exceedingly close resemblance between the two in physical constitution, and hence, according to our thesis, in mental constitution. Let us first see what are the facts in our favor; we will then consider objections and exceptions.

Perfect likeness between twins is a matter of every-day observation. In ancient times it was turned to account by comic poets, and ever since novelists have made use of it. But usually they have dealt only with external resemblances, as stature, figure, features, voice. There are resemblances far deeper than these. Physicians have for a long time remarked that most twins exhibit an extraordinary agreement in tastes, aptitudes, faculties, and even in their fortunes. Mr. Galton has investigated this subject by sending out a list of questions to which he received eighty replies whereof thirty-six entered into circumstantial details. Mr. Galton's purpose was entirely different from ours. In pursuing his researches on heredity he wished to determine by a new method the respective parts played by nature and education; but much of his material will be of great use to us.*

He gives many anecdotes of the same

character as those which have long been current, *e. g.*: one sister taking two music lessons a day so as to leave her twin sister free; the perplexities of a college janitor who whenever the twin brother of one of the students came to see his brother, was at a loss which of the two to let out, etc. In other cases the twins exhibit a persistent likeness to each other under circumstances little calculated to preserve it. Thus:

“A was coming home from India on leave; the ship did not arrive for some days after it was due; the twin brother B had come up from his quarters to receive A, and their old mother was very nervous. One morning A rushed in saying, ‘Oh, mother, how are you?’ Her answer was, ‘No, B, it’s a bad joke. You know how anxious I am’—and it was a little time before A could persuade her that he was the real man.” †

But facts regarding mental organization have more interest for us. “The next point,” says Galton,

“which I shall mention in illustration of the extremely close resemblance between certain twins is the similarity in the association of their ideas. No less than eleven out of the thirty-five cases testify to this. They make the same remarks on the same occasion, begin singing the same song at the same moment, and so on; or one would commence a sentence and the other would finish it. An observant friend graphically described to me the effect produced on her by two such twins whom she had met casually. She said: ‘Their teeth grew alike, they spoke alike and together, and said the same things, and seemed just like one person. One of the most curious anecdotes that I have received concerning this similarity of ideas was that one twin, A, who happened to be at a town in Scotland, bought a set of champaign glasses which caught his attention, as a surprise for his brother B, while at the same time, B, being in England, bought a similar set of precisely the same pattern for A. Other anecdotes of a like kind have reached me about these twins.’” ‡

Bodily and mental diseases, in themselves and in their evolution, supply many confirmatory facts. And though the latter are of interest only to the psychologist, the former disclose a likeness in the inmost constitution of the two organisms not to be seen at a glance like external resemblances. Says Trousseau:

“I have had as patients twin brothers that were so extraordinarily alike that it was

* See the title ‘History of Twins’ in Galton’s *Inquiries into Human Faculty and its Development*.

† Galton, *Inquiries into Human Faculty*. (London, 1883), p. 224.

‡ *Ibid.*, p. 231.

impossible for me to distinguish them except when they were side by side. This bodily resemblance went further still: there was even a more remarkable pathological likeness between them. One of them, whom I saw in Paris suffering from rheumatic ophthalmia, said to me: 'This very moment my brother is no doubt suffering from ophthalmia too.' I scouted the idea, but a few days afterward he showed me a letter he had just received from his brother, then at Vienne, in which he wrote: 'I have my ophthalmia, you too must be having yours.' Strange as this may seem, the fact was even so. This I have not on hearsay, but I myself have seen it, and similar cases have come to my knowledge in my practice."*

Galton gives many similar cases, but I quote only one. Two twins bearing a perfect resemblance to each other, with a strong mutual attachment and with identical tastes, were in government employ, and lived together. One fell sick of Bright's disease and died; the other was attacked by the same disorder and died seven months later.

Pages might be filled with similar cases. And it is the same with mental maladies. A few instances will suffice. Moreau of Tours had under treatment two twins physically alike and both insane. In them

"the dominant ideas are absolutely the same. Both believe themselves to be the victims of imaginary persecutions. The self-same enemies have sworn to undo them and employ the self-same means of attaining their ends. Both have hallucinations of hearing. They never address a word of conversation to any one, and are loth to answer questions. They always hold themselves aloof and do not communicate with each other. An exceedingly curious fact, and one again and again noticed by the attendants in their ward and by ourselves is, that from time to time, at very irregular intervals—two, three or more months—without ascertainable cause and by a spontaneous effect of their complaint, a very marked change occurs in the condition of the two brothers. Both of them, about the same period, often on the same day, quit their habitual state of stupor and prostration; they utter the self-same complaints and present themselves before the physician, earnestly begging to be allowed their liberty. I have been witness of this rather singular fact even when the twins happened to be several kilometers apart, one at Bicêtre, the other at the Ste. Anne farm."†

Recently the *Journal of Mental Science* published two observations on insanity in twins. Here we see two sisters much alike in features, manners, speech and mental traits, so that they might easily be taken for one another. They were placed in different wards of the same asylum without the possibility of seeing one another, and yet the symptoms of insanity were the same in both.

But we must meet some objections. There are some twins of one sex who do not resemble each other, and though the observed facts do not tell us in what proportion true twins (from one ovum) present these differences, one instance suffices to make the subject worthy of discussion. We have in another place † enumerated the many causes that in every individual, from conception till death, tend to produce variations, that is to say marks proper to that individual and differentiating him from all others. Here, as we have said, one class of causes must be eliminated, viz., those which come immediately from the parents. But the fecundated ovum represents also the ancestral influences—four, twelve, twenty-eight possible influences, accordingly as we go back to the grand-parents, great-grand-parents, great-great-grand-parents, and so on. Only by experience do we learn which influences prevail and in what degree. Here indeed one same ovum serves to produce two individuals; but there is nothing to prove that always and everywhere division is made between the two with strict equivalence in quantity and quality of the materials. The ova of all animals not only possess the same anatomic composition, but furthermore chemical analysis can discover in them only infinitesimal differences; nevertheless one ovum produces a sponge, another a human being. It follows that this apparent likeness hides profound differences which our keenest investigation fails to detect. Are these differences due to the nature of the molecular motions, as some authors think? We may suppose what we please, provided it be understood that the ovum is a complex product, and that the two individuals that come from it may not be rigorously alike. Our difficulty springs simply from ignorance of the processes according to which the primordial elements group themselves

* *Trousseau Clinique Médicale* I., p. 253.

† *Psychologie Morbide*, p. 172. See also an exceedingly curious case in the *Annales Médico-psychologiques*, 1863, tome I., p. 312. On the question of twins the reader may consult Kleinwächter's

special work, *Die Lehre von den Zwilligen*. Prag, 1871; also Dr. B. Ball, *Insanity in Twins* (HUMBOLDT LIBRARY, No. 87, page 37).

‡ *L'Hérédité Psychologique*, 2d edition, part II., ch. iv.

in order to constitute each individual, and consequently from our ignorance of the physical and psychical differences thence resulting. Some of Galton's correspondents mentioned the curious fact of some twins being "complementary to each other." The mother of a pair of twins wrote:

"There seemed to be a sort of interchangeable likeness in expression that often gave to each the effect of being more like his brother than himself."* "A fact struck all our school contemporaries, that my brother and I were complementary, so to speak, in point of ability and disposition. He was contemplative, poetical, and literary to a remarkable degree, showing great power in that line. I was practical, mathematical, and linguistic. Between us we should have made a very decent sort of a man."†

If the reader will consider how complex man's psychic organization is, and, in consequence of this complexity, how unlikely it is that two persons should be simply copies of each other, he will be inevitably led to the conclusion that one well-proved fact of this kind outweighs ten exceptions, and that the moral likeness is only the correlative of the physical. If *per impossibile* there were two men so constituted that their organisms should be identical, and their hereditary influences exactly the same: if *per impossibilius* both of them received the same physical and moral impressions at the same moment: then the only difference between them would be their position in space.

In concluding this chapter, I am a little ashamed to have collected so many proofs and arguments to establish what in my eyes is a plain truth, viz., that as the organism is, so is the personality. I should have hesitated to do it, were it not that this truth has been forgotten and misconceived rather than denied, and that authors have nearly always contented themselves with mentioning it under the vague heading of "influence of the physical upon the moral."

The facts so far studied do not of themselves lead to a conclusion: they only prepare the way. They prove that physical personality presupposes the properties of living matter and their coördination; that as the body is but the organized and coördinated sum of the elements that make it up, so the psychical personality is but the organized and co-

ordinated sum of the same elements regarded as psychic values. It expresses their nature and their action, nothing more. This is proved by the normal state, by teratological cases, and by the likeness between twins. The aberrations of physical personality, or as Bertrand ‡ happily denominates them, "hallucinations of the bodily sense" (*les hallucinations du sens du corps*) confirm this view. But there are deviations of human personality produced by other causes, by a more complex mechanism: these we are now to study.

CHAPTER III.

AFFECTIVE DISTURBANCE.

ONCE for all the reader must be reminded that in this chapter (as also in the one on intellectual disorders) we are still pursuing, under another form, the study of organic conditions. The desires, feelings, passions that give the fundamental tone to character, have their roots in the organism, are pre-determined by it. The same is true of the highest intellectual manifestations. Nevertheless since the psychic states have here a predominant rôle, we will treat them as immediate causes of changes of personality, the while never forgetting that these causes are in their turn themselves effects.

Without pretending strictly to classify affective manifestations (which we shall not have to consider in detail) we will reduce them to three groups of increasing psychological complexity but decreasing physiological importance. These are 1. Tendencies connected with the conservation of the individual (nutrition, defense); 2. Those which relate to the conservation of the species; and 3. The highest of them all, those which presuppose the development of mind (manifestations of a moral, religious, æsthetic, or scientific kind; ambition in all its forms; and the like). If we consider the development of the individual we find that it is in this order that feelings and sentiments make their appearance. It is seen more clearly still in the evolution of the human species. The inferior races, where education does not come in to correct nature, when they bring together the accumulated result of ages of labor, have little to show beyond the conservation of the individual

* *Inquiries into Human Faculty*, p. 224.

† *Ibid.*, p. 240.

‡ *De l'Aperception du Corps Humain par la Conscience*, p. 269, et seq.

and of the species, and present only the faintest trace of the sentiments enumerated under the third head.

The affective states relating to nutrition are, in the child during its early years, the only element, so to speak, of the nascent personality. From these come well-being and discomfort, desire and aversion : here we see that "bodily sense," of which we have spoken so often, arrived at its highest psychic expression. Inasmuch as certain natural causes, too evident to need enumeration, make nutrition the almost exclusively dominant concernment in the infant, the babe has and can have only an almost entirely nutritive personality, *i. e.*, the vaguest and lowest form of personality. The Me, in the view of whoever does not consider it as an entity, cannot be here anything but an extremely simple composite.

As we quit the period of infancy, nutrition plays a less dominant part, but it never loses its just place, for, of all the properties of the living being, this one alone is fundamental. Hence with variations in nutrition are connected serious alterations of personality. With nutrition reduced, the individual feels himself depressed, enfeebled, diminished. With nutrition increased, he feels himself stimulated, strengthened, reinforced. Of all the functions whose harmonious action constitutes this fundamental property of living beings, the circulation appears to be the one whose sudden variations have the greatest influence upon the affective states, and are most speedily answered by a counter-stroke. But we must quit conjectures about details, and look at the facts.

In the states known as hypochondria, lypemania, melancholia (in all its forms), we find alterations of personality ranging through all possible degrees, including complete metamorphosis. Physicians draw lines of clinical distinction between these different morbid states, but they do not concern us just now, and we may comprise them under one common description. There is a certain feeling of fatigue, oppression, anxiety, down-heartedness, sadness, absence of desire, persistent *ennui*. In the worst cases, the springs of the emotions are quite dried up. "The patients become insensible to everything. They are without affection, whether for their parents or for their children, and even the death of those who once were dear to them leaves them utterly cold and indifferent. They can no longer weep, and nought save their own

sufferings moves them."* Then, as regards bodily or mental activity : such patients exhibit torpor, powerlessness to act or even to will, insuperable inaction for hours at a time : in a word that "abulia" all the forms of which we studied in the work on *Diseases of the Will*. † As regards the outer world, the patient, though not hallucinated, finds all his relations to it changed. His habitual sensations seem to have lost their usual character. "Everything about me," said such a patient, "is still as it used to be, yet there must have been some changes. Things still wear their old shapes : I see them plainly, and yet they have changed a good deal too." One of Esquirol's patients complained "that his existence was incomplete. 'Every one of my senses,' he used to say, 'every part of myself is, so to speak, separated from me, and no longer gives me any sensation : it seems to me that I never come quite up to the things I touch.'" This state, due sometimes to cutaneous anæsthesia, may become so intensified that to the patient "it seems as though the real world had completely vanished or is dead, and that only an imaginary world remains in which he is anxious to find his place." ‡ To all this, add the physical symptoms, *viz.*, disordered circulation, respiration, and secretion. There may be great emaciation, and the weight of the body may decline rapidly during the period of depression. The respiratory function is retarded as also the circulation, and the body's temperature is lowered.

By degrees these morbid states become embodied, organized, and combine to produce a false conception which becomes a center of attraction toward which everything converges. One patient avers that his heart is a stone, another that his nerves are burning coals ; and so on. These aberrations have all sorts of forms, and they differ from one patient to another. In extreme forms, the individual doubts of his own existence, or denies it. A young man who said he was for two years dead, expressed as follows his perplexity : "I exist, but outside of real, material life, and in spite of myself, nothing having given me death. Everything is mechanical with me, and everything is done unconsciously." This contradictory situation, in which the subject says that

* Falret, *Archives Générales de Médecine*, Dec., 1878.

† No. 52 HUMBOLDT LIBRARY.

‡ Griesinger, *Traité des Maladies Mentales* (French Trans.), p. 265.

he is at once living and dead, would seem to be the logical, natural expression of a condition of things in which the former Me and the present Me, vitality and annihilation, come to equilibrium.

The psychological interpretation of all these cases admits of no doubt: here are organic perturbations whose first result is to reduce the sense-faculty in general, and whose second is to pervert it. Thus is found a group of organic and psychic states that tend to modify the constitution of the Me profoundly and in its inmost nature, because they act not after the manner of sudden emotions whose effect is violent and superficial, but slowly, silently, persistently. At first, this new state seems strange to the individual, something outside of himself. Little by little, through custom, it finds its place, becomes an integral part of the individual's being, and, if it is progressive, transforms him entirely.

Seeing how the Me is broken up, we can understand how it comes to be. Doubtless, in most cases, the change is only partial. The individual, while becoming for himself and for those who know him, other than he used to be, retains a residuum of himself. Complete transformation can, in fact, be only of rare occurrence; and it may be remarked that when the patient says he is changed, transformed, despite the contradiction or the ridicule of his friends, he is right and not they. He cannot feel otherwise, for his consciousness is but the expression of his organic state. Subjectively, he is not at all under an illusion: he is just what he must be. On the contrary it is the unconscious, unavowed hypothesis of a Me, independent and existing by itself as an unchangeable entity, that instinctively leads us to believe this change to be an external occurrence—or, as it were, some unwonted or ridiculous garb, while the fact is that the change is inward and involves gains or losses in the very substance of the Me itself.

The counterpart of these partial alterations of the Me is seen in cases where it becomes exalted, amplified, and where it immeasurably transcends its normal tone. Instances of this are seen in the beginning of general paralysis; also in certain cases of mania. This is in every respect the reverse of what occurs in those other cases. Here we see the patient possessed of a sense of physical and mental well-being, of abounding strength, of exuberant activity: he talks unceasingly, is a fertile de-

viser of projects and undertakings, ever traveling hither and thither to no purpose. The superexcitation of his psychic life has a corresponding superactivity of the organic functions. Nutrition becomes more active and is often excessive; respiration and circulation are accelerated; the genital function is quickened. Yet, despite the great expenditure of force, the patient feels no fatigue. Then these states become grouped and unified, and at length they in great part transform the Me. One man is conscious of herculean strength, is able to lift prodigious weights, to beget thousands of children, run a race with a railroad train, etc. Another possesses an inexhaustible store of science, is a great poet, great inventor, great artist, and so on. Sometimes the transformation comes still nearer to complete metamorphosis: mastered by the sense of boundless power, the patient calls himself pope, emperor, god. As Griesinger justly remarks,

“The patient feeling proud, daring, light hearted, conscious to himself of unwonted freedom in executing his projects, his mind swarming with ideas, is naturally led to conceive thoughts of greatness, station, wealth, great moral or intellectual power. * * * This overweening sense of strength and freedom must however have a reason: there must exist in the Me something to correspond to this; the Me must have become for the time being something quite different from what it was before, and this change can be expressed by the patient only by declaring himself to be Napoleon, the Messiah, or some other exalted personage.”*

We will not waste time in proving that this transformation of the Me, whether, partial or complete, momentary or permanent, is in kind the same as the preceding cases and that it presupposes the same mechanism. with this only difference, that here the Me undergoes dissolution in the reverse way, by excess, and not by default.

These *plus* or *minus* alterations of personality, this metamorphosis of the Me, which raises it or lowers, would be still more striking if they succeeded one another regularly in the same individual. Now this occurs often in what is called *folie circulaire*, or *folie à double forme*, a malady characterized essentially by successive periods of depression and exaltation following one another in fixed order, with intermissions of lucidity in some patients. Here we observe a curious fact. Upon the personality that may be called

* *Op. cit.*, p. 333.

the original and fundamental one, are grafted, one after the other, two new personalities not only quite distinct, but totally exclusive of each other. Upon this point it is necessary to give the gist of a few observations.* A woman whose case was observed by Morel, had been abandoned to a vicious life by her mother from the age of fourteen years.

"Later, in her shame and wretchedness, her only resource was to enter a brothel. She was taken thence one year afterward and placed in the convent of the Good Shepherd at Metz. Here she stayed two years, and the too strong reaction that took place in her feelings gave rise to religious mania, which was followed by a period of profound stupidity."

Being now placed under the care of a physician, she would pass through two alternate periods, believing herself to be in turn prostitute and nun. On emerging from the period of stupidity,

"she would go to work regularly, and her language was always proper, but she would arrange her toilet with a certain *coquetterie*. Then this tendency would increase, her eyes growing brighter, her glance lascivious; she would dance and sing. At last her obscene language and her erotic solicitations would compel her sequestration in solitary confinement. She would say her name was Madame Poulmaire, and would give the fullest details of her former life in prostitution. Then, after a period of depression, she would become again gentle and timid, carrying even to scrupulousness the sense of propriety. She would now arrange her toilet with the utmost austerity. The tone of her voice too would assume a peculiar character, as she spoke of the Good Shepherd convent at Metz and of her longing to return thither. Now her name would be Sister Martha of the Five Wounds, Theresa of Jesus, Mary of the Resurrection, etc. She would not speak in the first person singular, but would say to the attendant sister, 'Take *our* dress'; 'there is *our* handkerchief.' Nothing was her own any more, according to the rule in convents. She would have visions of angels smiling upon her, and moments of ecstasy."

In a case reported by Krafft-Ebing, a neuropathic patient, son of an insane father, "during the period of depression was disgusted with the world, and all his thoughts were about the nearness of death, and about eternity, and his purpose then was to become a priest. During his maniacal periods he was noisy,

pursued his studies with mad ardor, would not hear of theology, and thought only of practicing medicine."

An insane woman at Charenton, possessing very remarkable power and originality of mind,

"from day to day would change in personality, in condition, in life, and even in sex. Now she would be a young lady of blood royal betrothed to an emperor; anon a plebeian woman and a democrat: to-day a wife and in the family way; to-morrow still a maid. It would happen also that she would think herself a man, and one day she imagined herself to be a political prisoner of importance, and composed some verses upon the subject."

Finally in the observation which follows we find the complete formation of a second personality.

"A lunatic in the Maison de Vanves," says Billod,† "about every eight months would let his beard grow and would show himself to all the inmates in unusual garb and with unwonted behavior, giving himself out to be one Nabon, an artillery lieutenant lately returned from Africa to take the place of his brother. The patient would then remain several months in a state of great exultation, adapting all his conduct to his new character. After some time he would announce the return of his brother who, he would say, was in the village and was now to take his place. Then some day he would have his beard shaved off, would make a complete change in his habits and demeanor, and would resume his true name. But now he would present all the signs of melancholia, walking about slowly, loving silence and solitude, continually reading the *Following of Christ* and the *Fathers of the Church*. In this mental state, a lucid one if you please, but one that I am far from considering as normal, he would remain till the coming back of 'Lieutenant Nabon.'"

The two cases first cited are, in reality, but an exaggeration, a largely magnified copy, so to speak, of the normal state. The Me is always made up of contradictory tendencies—virtues and vices, modesty and arrogance, avarice and prodigality, desire for rest and need of action, and so on. Usually these opposite tendencies equilibrate one another, or at least the one which dominates is not without its counterpoise. In the cases before us, in virtue of pretty well ascertained organic conditions, not only is equilibrium impossible, but a group of tendencies becomes hypertrophied at the expense of the antagonist group, which becomes

*They can be found *in extenso* in Ritti, *Traité Clinique de la Folie à Double Forme*. Paris, 1883. Obs. XVII., XIX., XXX., XXXI.

† *Annales Médico-psychologiques*, 1858.

atrophied; then an inverse reaction takes place, so that the personality, instead of consisting of those mean oscillations whereof each one represents one side of human nature, passes ever from one excess to another. We may remark that these diseases of personality consist of a reduction to a simpler state: but we must not yet dwell upon that point.

Nutrition being less a function than the fundamental property of whatever has life, the tendencies and the feelings connected with it possess a very general character. The same cannot be said of what concerns the conservation of the species. That function, attached as it is to a definite part of the organism, finds expression in very definite feelings. Hence this is well fitted to verify our thesis; for if personality is a composite varying according to its constituent elements, a change in the sex instincts will change the personality, a perversion will pervert it, an interversion will invert it: and this is just what happens.

First let us recall some known facts, though commonly the conclusions they enforce are not drawn. At puberty a new group of sensations and consequently of feelings, sentiments and ideas comes into existence. This influx of unwonted psychic states—stable because their cause is stable, coördinated to one another because their source is one—tends profoundly to modify the constitution of the Me. It feels undecided, troubled with a vague and latent unrest whose cause is hid. Little by little these new elements of the moral life are assimilated by the existing Me, enter into it, are converted into it, withal making it other than it was. It is changed; a partial alteration of the personality has taken place, the result of which has been to produce a new type of character—the sexual character. This development of an organ and of its functions, with their train of instincts, imaginings, feelings, sentiments and ideas, has produced in the neuter personality of the child a differentiation—has made of it a Me male* or female, in the complete sense of the term. Till now there existed only a sort of rough draft [*ébauche*] of the complete personality, but that has served to obviate all sudden shock in the change, to prevent a rupture between the past and the present, to make the personality continuous.

If now we pass from the normal development to exceptional and pathological

cases, we shall find variations or transformations of personality dependent on the state of the genital organs.

The effect of castration upon animals is well-known. Not less known is its effect upon man. A few exceptions apart (and such are found even in history) eunuchs present a deviation from the psychic type. "Whatever we know about them," says Maudsley, "confirms the belief that they are for the most part false, lying, cowardly, envious, revengeful, void of social and moral feeling, mutilated in soul as well as in body." Whether this moral degradation be the direct result of castration, as some authors assert, or whether it result from an equivocal social situation, is a question that does not affect our thesis: whether the result comes directly or indirectly from the mutilation, the cause remains the same.

As regards hermaphrodites experience verifies what we might have predicted *a priori*. With the characteristics of one sex they present some of those peculiar to the other, but instead of combining the functions of both, they possess only imperfect organs, and commonly these are sexually impotent. The moral character of hermaphrodites is sometimes neutral, again masculine, in other cases feminine. Abundant instances are cited by writers who have treated the question.* "Sometimes the hermaphrodite, after having shown a very strong liking for women, is animated with the very opposite instincts by the descent of the testicles." In a case recently observed by Dr. Magitot an hermaphrodite woman successively manifested feminine tastes and very pronounced masculine appetites. "In general the affective faculties and the moral dispositions show the effects of the malformation of the organs. Nevertheless, it is but fair" says Tardieu, "to make large allowance for the influence of the habits and occupations imposed upon these individuals by the error as to their real sex. Some of them being from the first educated as girls, dressed as girls, employed in women's work, married perhaps as women, retain the thoughts, the habits, the demeanor of the female sex. Such was the case with Maria Arsano, deceased at the age of eighty years, who was in fact a man whose character had been made feminine by habit."

I do not propose here to detail the

* For the facts see Isidore Geoffroy Saint-Hilaire *Histoire des Anomalies* vol. II., p. 65, et seq. Also Taraieu and Laugier, *Dictionnaire de Médecine*, art. HERMAPHRODISME.

perversions or aberrations of the sexual instinct, * each one of which imprints its mark upon the personality, altering it more or less, transiently or permanently. These partial alterations reach their term in total transformation, in change of sex. There are many instances of this: the following may serve as a type. Lallemand records the case of "a patient who believed himself to be a woman, and who wrote letters to an imaginary lover. At the autopsy there was found an hypertrophy with induration of the prostate, and an alteration of the ejaculatory canals." It is probable that in many cases of this kind there has been perversion or abolition of the sexual feelings.

Some exceptions, however, are to be noted. From sundry detailed observations (which see in Leuret, *Fragments Psychol.*, p. 114 *et seq.*) we learn of individuals who assume the gait, the habit, the voice, and, as far as they may, the garb of the sex they imagine themselves to belong to, though they present no anatomical or physiological anomaly of the sexual organs. In such cases the starting point of the metamorphosis is to be sought elsewhere: it must be found in the cerebro-spinal organ. Indeed when we speak of the sexual organs as constituting or as modifying personality, we are to be understood as speaking, not of those organs themselves alone as defined by their anatomic conformation, but also of their relations to the encephalon, in which they are represented. Physiologists locate in the lumbar region of the spinal column the reflex genito-spinal center. From that center to the brain all is undiscovered territory; for the hypothesis of Gall, who made the cerebellum the seat of physical love, is not much in favor, despite the confirmatory observations of Budge and of Lussana. But however great our ignorance upon this point, sexual impressions must reach the encephalon, for they are felt, and there are centers from which psychic incitations are sent out to the sexual organs to put them in action. These nerve-elements, whatever their nature, their number, or their seat; whether they are localized or diffused, are the cerebral, and consequently the psychic, representatives of the sexual organs; and since in producing a special state of consciousness they usually produce others also, there must

be some association between this group of psycho-physiological states and a certain number of others. The conclusion to be drawn from the cases already cited, is that there has arisen a cerebral disorder of unknown character (a woman supposing herself to be a man, or *vice versa*) whence results a fixed erroneous state of consciousness. This fixed state of consciousness, predominating over the normal states, calls forth natural, almost anatomical associations, which are as it were its radiations (the feelings, the ways, the speech, the dress of the imaginary sex): it tends to complete itself. Here is a metamorphosis from above not from below; and here we have an instance of what is called the influence of the moral upon the physical. We will endeavor to show further on that the Me upon which most psychologists have based their reasonings is formed by a like process. Further these cases belong among the *intellective* deviations of personality, of which we shall treat in the next chapter.

Before we quit this subject, I would notice a few facts hard to account for, but which nevertheless cannot be seriously alleged against our thesis. I refer to the phenomenon of "opposite sexuality" [*sexualité contraire*] often mentioned of late, and about which a few words will suffice. Certain patients observed by Westphal, Krafft-Ebing, Charcot and Magnan, Servaes, Gock, *et al.*, present a *congenital* introversion of the sexual instinct, whence results, despite their normal physical constitution, an instinctive and violent attraction to a person of the same sex, with strong repulsion toward the opposite sex: in short, "a woman will be a woman physically but psychically a man: a man will be physically a man, psychically a woman." These facts are entirely at variance with what logic and experience teach us: here the physical and the moral are in mutual contradiction. Strictly speaking, those who regard the Me as an entity might quote these facts as proving its independence, its autonomous existence. Nevertheless that were a gross illusion, for their whole argument would rest upon two very weak bases, viz., on some facts of very rare occurrence, and on the present difficulty of finding an explanation of them. No one will deny that cases of "opposite sexuality" are but an infinitesimal fraction of the sum of the cases known to us by experience. By their rarity they form an exception, and by their nature a psychological monstrosity: but monstros-

* For a full discussion of this question see the article by Dr. Gley, "Sur les Aberrations de l'Instinct Sexuel" in the *Revue Philosophique*, Jan. 1884.

ities are not miracles, and it behooves us to find out whence they come.

We might attempt to account for them in many ways, but that usually means that no explanation is sufficient. I will not inflict these explanations upon the reader. Like every other science, psychology must be resigned to be ignorant for a time, and must not fear to confess ignorance. Herein it differs from metaphysics, which undertakes to explain all things. Physicians who from their own medical point of view have studied these strange creatures, regard them as degenerate individuals. The point of special interest for us would be to know why degenerescence takes this form and not another. Probably the explication of this mystery is to be sought in the multiple elements of heredity, in the complex play of the conflicting male and female elements: I leave the question to minds more clear-sighted and more fortunate in discovering the causes of things. But aside from the question of the cause, one can hardly refuse to recognize a deviation of the cerebral mechanism, as in the cases quoted by Leuret, and in like instances. But the influence of the sexual organs upon the nature and formation of character is so little open to question that to dwell upon it were to waste time, and an hypothetical explanation of "opposite sexuality" would in no wise further our research.

The instincts, desires, tendencies, sentiments, etc., that relate to the conservation of the individual and to that of the species, have their material conditions clearly determined, the former in the totality of organic life, the latter in a special set of organs. But when from the primordial and fundamental forms of the affective life we pass to those which are of secondary formation and which have sprung up later in the course of evolution (tendencies social, moral, intellectual, æsthetic, etc.), then, to say nothing of the impossibility of assigning to these their direct organic bases, we find that they are by no means so general; none of them, except perhaps the moral and the social tendencies, express the individual in his totality; they are partial, and represent only one group in the sum total of his tendencies. Hence no one of them has of itself the power of producing a metamorphosis of the personality. As long as the habitude we call bodily sense (or cœnæsthesis) and that other habitude

which is memory, do not come into play, there can be no complete transformation: the individual may be changed, he does not become *another*.

But these variations, though partial, are interesting. They show the transition from the normal to the morbid state. In studying the diseases of the will* we found in ordinary life many foreshadowings of the graver forms. Here, too, common observation shows us how little cohesion and unity the normal Me possesses. Apart from perfectly balanced characters (though in the strict sense of the term such characters do not exist) there are in every one of us tendencies of every kind, in every degree of contrariety, with all possible intermediate shades of difference, and with all sorts of combinations between them. For the Me is not merely a memory, an accumulation of recollections linked to the present moment, but a sum of instincts, tendencies, desires, which are simply its innate and acquired constitution entering into action. Memory is the Me *statical*, the group of tendencies is the Me *dynamical*. If, instead of being influenced unconsciously by the idea of the Me being an entity—a prejudgment instilled into us both by education and by the so-called testimony of consciousness—we were to take it for what it is, namely a coördination of tendencies and of psychic states whose proximate cause is to be sought in the coördination and consensus of the organism, we should no longer be surprised at its oscillations—incessant in fickle, but rare in stable characters—which for a longer or a shorter time, or even for an almost infinitesimal instant, exhibit the person in a new light. Some organic state, some external influence, reinforces some tendency; it becomes a center of attraction toward which converge the directly associated states and tendencies; then associations grow closer and closer; the center of gravity of the Me becomes displaced, and the personality is altered. "Two souls" said Goethe "dwell in my breast." Nor two only! If the moralists, poets, dramatists have shown us to satiety these two Mes contending in one Me, common experience shows yet more; it shows us many Mes, each as it comes to the forefront, excluding the others. This is less dramatic, but more true. "Our Me differs widely from itself at different times: according

* See the work so entitled (HUMBOLDT LIBRARY No. 52).

to a person's age, his various duties, the occurrences of his life, the excitements of the moment, such or such an aggregation of ideas which at a given moment represents the Me, becomes more highly developed than others, and takes the foremost place. We are another and yet the same. My Me as physician, my Me as man of science, my sensuous, my moral Me, etc., in other words, the complex of ideas, inclinations, will-tendencies, so denominated, may at any time come into a state of mutual opposition and repulsion. This would result not only in discord and scission between thought and will, but also in total loss of power, for each of these two isolated phases of the Me, if in all these spheres there was not a more or less open way for the return of the consciousness of some of these fundamental directions.* The orator, master of speech, who while speaking judges himself; the actor who notes his own performance; the psychologist who studies himself, all are instances of this normal scission of the Me.

Between these momentary and partial transformations (which because they are common do not strike one as psychologically important) and the more serious states we have yet to consider, there exist intermediate variations either more stable or more far-reaching, or both. The dipsomaniac, for example, leads two alternate lives: in one he is sober, discreet, industrious; in the other quite overmastered by passion, reckless, heedless. It is as though two incomplete and contrary individuals were grafted on a common trunk. The same is true of those who are subject to irresistible impulses and who declare that an external force constrains them to act in spite of themselves. We may cite also those transformations of character which are accompanied by cutaneous anæsthesia. One of the most curious instances of this was observed by Renaudin: A young man whose conduct had always been exemplary, suddenly gave way to evil tendencies. His mental state gave no clear evidence of alienation, but it was noticed that the whole surface of his body had become absolutely insensible. The cutaneous anæsthesia was intermittent. "When it ceased, the young man's dispo-

sition was quite different; he was now docile, affectionate, fully conscious of his painful situation: when it returned, immediately his evil inclinations controlled him, and these, as we found out, might go even so far as to incite him to homicide."

Inevitably we come back in every case to the organism. But this *excursus* through diverse fields of observation, however monotonous it may be, exhibits to us the variations of personality in all its aspects. Since no two cases are identical, each one offers a special decomposition of the Me. The cases last cited show us a transformation of character without lesion to the memory. As we proceed with our review of the facts, one conclusion will more and more impress itself upon our minds, viz., that *personality results from two fundamental factors—the bodily constitution with its tendencies and feelings, and the memory.*

If (as in the cases so far considered) only the first of these factors is modified, the result is a momentary dissociation followed by a partial change of the Me. If the modification is so profound that the organic bases of memory suffer a kind of paralysis, and become incapable of being revived, then the disintegration of the Me is complete: there is no longer a past, and there is a different present. Then a new Me is formed, and usually it knows nothing of the former Me. The cases of this kind are so well known that I will simply mention them, viz., the case of the American lady described by Macnish, that of Félicité, described by Dr. Azam, and those recorded by Dufay.† Just because they involve the entire personality, these cases come under no specific heading, and we have no reason for mentioning them here rather than anywhere else, except that we wish to remark that the transition from one personality to another is always accompanied by a change of the character, associated no doubt with the unknown organic change which dominates the whole situation. This change is very clearly pointed out by Dr. Azam: his patient (Félicité) is at one period gloomy, cold, reserved; in the other period, gay, sprightly, cheerful, full of life, even boisterous. The change is greater still in the following case, which I give in

† For a full account of the observations, see Taine, *De l'Intelligence*, vol. I. p. 165; Azam, *Revue Scient.*, 20 May, 1876, 18 Sept., 1877, 10 Nov. 1879; Dufay, *ibidem*, 15 July, 1876. As regards the part played by memory in pathological cases, see *Diseases of Memory* (HUMBOLDT LIBRARY No 46), page 16 et seq.

* Griesinger, *Maladies Mentales*, p. 55. See a good essay by Paulhan on *Les Variations de la Personnalité à l'Etat Normal* (*Rev. Philos.*, June, 1882).

some detail because it is recent and little known.*

The subject, a youth of seventeen years, V. L.—had an attack of hystero-epilepsy and quite lost all recollection of one year of his life. His character underwent a total change.

Born of "an unmarried vagabond girl and an unknown father, as soon as he was able to walk he began straying about the streets and begging. Later he became a thief, and was arrested and sent to the St. Urbain penal colony, where he worked as a farm-hand." One day while employed in the vineyard he grasped in his hand a snake concealed in a bundle of vine-cuttings. His fright was extreme, and on his return to the colony in the evening he lost consciousness. This fit returned again and again; his legs grew weak; at last came paralysis of his lower limbs, his intelligence remaining intact. He was now transferred to the Bonneval Asylum. There the physician reported of him that he had "a kindly, sympathetic expression"; that he was "of a mild disposition, and grateful for the care bestowed upon him. He would tell the story of his life with fullest details, even his thefts, of which he was ashamed. He laid the blame to his homelessness and to the influence of his companions, who led him into evil. He regretted the past, and declared that in the future he would lead a better life." It was decided to fit him for some occupation compatible with his infirmity. He learned to read, also to write a little. He was taken every morning to the tailor's shop, and being placed upon a table, assumed quite naturally the tailor's posture, his legs being paralyzed and greatly atrophied and contracted. At the end of two months he could sew very well, and was a diligent worker."

He had now an attack of hystero-epilepsy which continued for fifty hours, being succeeded by a quiet sleep. Then his former personality came back.

"On awaking, V— wanted to get up. He asked for his clothes, and succeeded in putting them on, though awkwardly; then he took a few steps about the room. The paraplegia had disappeared. His gait was unsteady and his legs could not sustain the weight of his body, but that was due to the atrophied state of the muscles. When his clothes were on, he wanted to go out to work on the farm with his comrades. We saw at once that the lad thought he was still

at St. Urbain's, and that he wanted to resume his habitual occupations. He had in fact no recollection of his attack: did not recognize any one here—neither the doctor and nurses, nor his fellow-patients. He refused to believe that he had been paralyzed, saying that we were making sport of him. We attributed this to a momentary *vesania*, not an unusual sequel of strong hysteric seizures. But time went on, and still memory did not return. V— remembered distinctly his having been sent to St. Urbain's, that 'the other day' he was frightened by a snake, but from that point forward all was blank. He remembered nothing: he had no consciousness even of the lapse of time.

"Naturally we suspected that he was feigning, as hysterical subjects are wont to do, and we tried in every way to make him contradict himself, but in vain. Thus, we had him taken to the tailor's shop without letting him know where he was going. We walked alongside of him, careful not to give him a hint as to what direction he should take. V— did not know where he was going. Arrived at the shop, he gave no sign of knowing where he was, and declared he came there now the first time. A needle was put in his hand and he was asked to use it in sewing, but he set about it as clumsily as any one does who attempts for the first time to perform the task. Garments were shown him on which he had done the coarser stitching while in the paralytic state. In vain: he recalled nothing of all this. After a month of experiments, observations, and tests of every kind; we were convinced that V— remembered nothing."

One of the most interesting points of this case is the modification of the patient's character—a reversion to his prior life and hereditary antecedents.

"He is no more the same person: he is now quarrelsome, and an inordinate eater. He makes rude answers. He cared not for wine and usually gave his share of wine to his comrades: now he steals theirs. When some one tells him that once he used to steal, but that he ought not to begin thieving again, he boldly says that 'if he was a thief, he has paid for it, for they have put him in prison.' He is employed in the garden. One day he ran away, taking with him some property and sixty francs belonging to one of the infirmarians. He was captured five leagues away from Bonneval, just after he had sold his clothes to purchase others and was making ready to take the train for Paris. The arrest was not easily made, for he struck and bit the keepers who had come in pursuit of him. Brought back to the asylum, he became furious, shouting, and rolling upon the ground, so that he had to be confined in a cell."

* The case is reported by Dr. Camuset in the *Annales Médico-psychologiques*, Jan., 1882.

anomalies of personality in all its forms, it will not be out of place here to attempt a few partial and provisional conclusions which will serve to lessen the obscurity of the subject. I will confine myself however to one point—to cases of false personality consisting essentially of a fixed idea, an overweening idea toward which converges the whole group of concordant ideas, all others being eliminated and as it were annihilated: as when persons believe themselves to be God, pope, emperor, and speak and act accordingly. The study of the intellectual conditions of personality will furnish us with many an instance of this—hypnotized subjects, for example, who assume a personality or enact a rôle at the operator's will; but the instances we are already familiar with warrant a question as to what we are to learn from them.

At first view, these cases are quite simple as regards the mechanism of their formation. The prime origin is obscure; why is this particular idea produced and not some other? Commonly we know nothing whatever about it, but once the morbid conception produced, it grows and grows, till at last it reaches its highest point, through the mere automatism of association of ideas. Hence it is not my intention to dwell upon this point, but to show that these pathological cases explain for us an illusion into which psychology has almost always fallen when it has based itself simply upon internal observation—the illusion of substituting for the real Me a factitious Me that is far simpler.

In order to comprehend the real, concrete personality and not an abstraction substituted in its room, what we must do is, not to shut ourselves up in our consciousness and, closing our eyes, proceed to question it: rather must we open our eyes and observe. The child, the peasant, the laborer, the millions of people who walk the streets or who work in the fields; who have never heard of Fichte or Maine de Biran; who have never read a dissertation on the Me and the non-Me, nor a single line on psychology—have each one his own definite personality, and this personality they instinctively affirm. Every moment ever since that forgotten epoch when their Me was first constituted, *i. e.*, when it was formed as a coherent group amid the occurrences that assail it, that group has maintained itself steadily, steadily undergoing modification. In great part it is made up of states and acts nearly automatic which

in each individual constitute the bodily sense (or *cœnæsthesis*) and the routine of life; which serve as support to all the rest, but whose every alteration, how brief or partial soever, is immediately felt. In great part too it is made up of a complex of sensations, images, ideas, representing the habitual environment within which the individual lives and moves, with the recollections thereto attached. All this represents organized states, firmly linked together, mutually calling each other forth, systemized. The fact we actually are cognizant of, though we may not inquire into the cause. Whatever is new, unwonted; all changes in the state of the body or of its environment, are unhesitatingly adopted, classed by an instinctive act as forming part of the personality or as being external to it. Not by a definite and explicit judgment is this operation performed each moment, but by an unconscious logic far more profound than the logic of the schools. Had we to characterize with one word this natural, spontaneous, real, form of personality I should call it an *habitude*: nor can it be anything else, since, as we maintain, it is but the expression of an organism. Let the reader, instead of observing himself, proceed objectively: that is, let him observe and interpret with the aid of the data of consciousness the state of those who have never reflected upon their personality, and he will see that the foregoing thesis is true, and that real personality affirms itself not by reflection but by acts.

Let us now consider factitious or artificial personality. When the psychologist essays to comprehend himself, as he says, by inward observation, he attempts the impossible. When he sets about the task, either he restricts himself to the present, and that helps him little: or, letting his reflection extend over the past, he affirms himself to be the same that he was a year or ten years ago; he does but express learnedly and laboriously what any peasant knows as well as himself. By inner observation he can grasp only transitory phenomena, and so far as I know answer has never been made to these just observations of Hume:

“As for me, whenever I contemplate what is inmost in what I call my own self, I always come in contact with such or such special perception as of cold, heat, light or shadow, love or hate, pleasure or pain. I never come unawares upon my mind existing in a state void of perceptions: I never observe aught

save perception. . . . If any one, after serious reflection and without prejudices, thinks he has any other idea of himself, I confess that I can reason no longer with him. The best I can say for him is that perhaps he is right no less than I, and that on this point our natures are essentially different. It is possible that he may perceive something simple and permanent which he calls himself, but as for me I am quite sure I possess no such principle." Hume, Works, vol. 1, p. 321.

Since Hume's day some one has said: "Through the sense of effort and of resistance we feel that we cause" [*par l'effort et la résistance, nous nous sentons cause*]. True; and pretty nearly all schools agree that in this way the Me distinguishes itself from the non-Me: but the sense of effort nevertheless is still simply a state of consciousness—the sense of the muscular energy spent to produce a given act.

To seek to grasp by analysis a synthetic whole as personality is, or by an intuition of consciousness lasting at most a few seconds to seize a complex like the Me, were to attempt the solution of a problem whose data are mutually contradictory. The psychologists have gone to work differently. They have considered states of consciousness as accessories, and the tie that connects them as the essential thing: and it is this mysterious *underlying something* that, under the name of unity, identity, or continuity, becomes the true Me. Nevertheless plainly we have here only an abstraction, or more precisely a *schema*. For the real personality has been substituted the *idea of personality*—a very different thing. This idea of personality is like all general terms formed in the same way, as sensibility, will, etc.; but it is no more like the real personality than the plan of a city is like the city itself. And as in the cases of aberration of personality that have led to the present remarks, one idea has taken the place of a complex, forming an imaginary and a diminished personality, so by the psychologist the *schema* of personality is substituted for the concrete personality, and it is upon this beggarly framework that he rests all his reasoning, inductions, deductions and dogmatizings. Of course this comparison is made on the condition of *mutatis mutandis* and with many restrictions, which the reader will find out for himself.

In short, for one to reflect on his Me is to take an artificial position which changes its nature—to substitute an abstract representation for a reality. The

true Me is that which feels, thinks, acts, without exhibiting itself, so to speak, to itself upon a stage. For the Me is in its nature and by its definition a subject; and to become an object it must undergo a reduction, an adaptation to the mind's optical conditions, and that transforms it, mutilates it.

Till now we have considered the question only on its negative side. To what positive hypothesis as to the nature of personality are we led by the observation of morbid cases? First let us lay aside the hypothesis of a transcendental entity—an hypothesis that cannot be reconciled with pathology, and which explains nothing.

Let us put aside also the hypothesis which makes of the Me "a bundle of sensations" or of states of consciousness, as many have held it to be, following Hume. So to think is to take appearances for reality, a group of signs for a thing, or more exactly, to take effects for their cause. Besides, if, as we hold, consciousness is only an indicative phenomenon, it cannot be a constitutive state.

We have to penetrate deeper, to that *consensus* of the organism of which the conscious Me is but the psychological expression. Has this hypothesis any firmer ground than the other two? Both objectively and subjectively considered, the characteristic trait of personality is that continuity in time, that permanence which is called identity. This has been denied of the organism, on grounds so well known that there is no need to state them: but it is strange that those who refuse to concede continuity, identity, to the organism should fail to see that all the arguments for a transcendental principle hold good also for the organism, and that all the arguments that can be brought against the latter have the same force against the former. That every higher organism is *one* in its complexity is an observation at least as old as the Hippocratic writings; and since Bichat's time no one attributes this unity to a mysterious vital principle; certain writers however make a great noise about the constant molecular renovation which constitutes life, and ask, Where is the identity? But as a fact every one believes in this identity of the organism. Identity is not immobility. If, as some savants hold, life has its seat not so much in the chemical substance of the protoplasm, as in the motions of the particles, then it is a "combination of motions," or a "form of motion," and this constant

molecular renovation must itself be subordinate to more recondite conditions. However that may be, every unbiased mind will admit that the organism possesses identity. What hypothesis then could be more simple or more natural than to consider the conscious identity as the inward manifestation of the external identity subsisting in the organism?

On this physical basis of the organism rests also, according to our thesis, what we call the unity of the Me, *i.e.*, the interdependence which links together the states of consciousness. The unity of the Me is the unity of a complexus, and only by a metaphysical illusion do we accord to it the ideal unity of the mathematical point. It consists not in the act of a supposedly simple "essence," but in a co-ordination of the nerve centers, which themselves represent a co-ordination of the functions of the organism. It is true that here we have to do with hypotheses, but at least they have no supernatural character.

Take man in the foetal state, before the beginning of psychic life: leave out all the hereditary dispositions already in any way impressed upon him, which will later come into play. At some undefined period, at the latest in the last weeks of the foetal life, some sort of body sense (*cœnæsthesia*) must come into existence—a vague feeling of well-being or of discomfort. However confused this may be supposed to be, it implies certain modifications in the nerve centers, as far as their rudimentary state may allow. When, later, sensations (objective or not) of external causation are added to these simple vital, organic, sensations, they too necessarily produce a modification in the nerve centers. But they are not inscribed on a *tabula rasa*; the warp of the psychic life is already laid, and this warp is general sensibility, the feeling of life, which, even though it be very vague, absolutely constitutes, at this period of life, almost the total sum of consciousness. Thus we have a glimpse of the origin of the connection between states of consciousness. The first sensation—supposing one to exist in the isolated state—does not come like an aërolite in a desert: at its entrance even it is connected with others—with the states which constitute the bodily sense, and which are simply the psychic expression of the organism. In terms of physiology, this means that the modifications of the nervous system representing materially sensations and the desires that arise out

of them (these being the first elements of the higher psychic life) are added to prior modifications which are the material representatives of the vital and organic sensations; and that thereby relations are established between these nervous elements; so that from the first the complex unity of the Me has its conditions of existence, and these it finds in that general consciousness of the organism so much overlooked, though it is nevertheless the main support of all the rest. In short, all depends upon the unity of the organism: and when the psychic life, having itself passed the embryonic stage, has taken shape, the mind may be compared to a rich piece of tapestry where the warp has completely disappeared, being in some instances lightly overlaid with figures, in others being embroidered in high relief; the psychologist who employs inner observation only, sees but the figures and the embroidered designs, and loses himself in a maze of conjecture as to what may underlie them; if he were but to change his position or to look at the reverse side, he would save himself many a useless induction, and would learn more.

The same thesis might be discussed under the form of a criticism of Hume. The Me is not, as Hume held, a mere bundle of perceptions. Without appealing to psychology, but confining one's self to simple ideological analysis, one observes here the omission of one important point, *viz.*, the *relations* between the primordial states. Relation is an element vague in its nature, and hard to determine, since it does not exist by itself. Still, it is something more and something else than the two states which limit it. In Herbert Spencer's *Principles of Psychology* is found a searching study (too little noticed) of the elements of psychic life, with hypotheses as to their material conditions. Quite recently Mr. W. James has taken the question up again.* He compares the course of our consciousness with its uneven flow to the progress of a bird that alternately flies and perches. The resting-places are occupied by relatively stable sensations and images: the spaces passed over in flight are represented by thoughts of relations between the points of rest: the latter—the "transitive portions" are nearly always forgotten. It seems to me

* See *Mind*, Jan., 1884, p. 1 *et seq.*

that this is our thesis in another form—the continuity of the psychic phenomena by reason of a deep, hidden *substratum*, to be sought in the organism. In truth, that were a precarious sort of personality which should have no other ground, but consciousness, and this hypothesis is found wanting when tested by the simplest facts: as for instance when an explanation is asked of the fact that after a sound sleep of six or eight hours I unhesitatingly declare my identity. To refer the essence of our personality to a mode of existence (consciousness) that disappears at least during one-third of our life, is to offer a curious solution.

We therefore maintain, as we have elsewhere done with regard to memory, that individuality, in itself and such as it exists actually in the nature of things, is not to be confounded with individuality as it exists for itself in virtue of consciousness (personality). The organic memory is the basis of all the highest forms of memory, these being only its more perfect phases. The organic individuality is the basis of all the highest forms of personality, which are only its development. Of personality, as of memory, I hold that it is completed, perfected, by consciousness, not constituted by consciousness.

Although, in order to keep these remarks within due limits, I have carefully abstained from all digression, from criticism of opposite doctrines, and from exposition of points of detail, I must, in passing, point out one question which suggests itself naturally: Does the consciousness of our personal identity rest upon memory, or *vice versa*? One person will say, without memory I should be but a present existence incessantly renewed, and that does away with all possibility, however faint, of identity. Another will say, without a feeling of identity binding them together and impressing a character upon them, my recollections would not be mine: they would be foreign to me. Is it then memory which produces the sense of identity, or is it the sense of identity which produces memory? Neither! These are both *effects*, whose cause is to be sought in the organism: for on the one hand its (the organism's) objective identity is expressed in that subjective state which we call the sense of personal identity; and on the other hand, it is here (*i.e.* in the organism) that are enregistered the organic conditions of our recollections, and here too is found the basis of our conscious memory. The

feeling of personal identity, as well as memory in the psychological sense, are effects whereof the one cannot be the cause of the other. Their common origin is in the organism, where identity and organic enregistration (*i.e.* memory) are one. Here we touch one of those malposed-questions which abound in the hypothesis of an entity-consciousness.

CHAPTER IV.

INTELLECTIVE DISTURBANCE.

IN certain morbid states the traditional five senses are subject to serious perturbations, their functions becoming perverted or distorted. Do these "paræsthesias" and "dysæsthesias" play any part in changes of personality? Before we examine this point, we have first to ask, what happens when one or more of the senses are suppressed? Is the personality then altered, maimed, or transformed? Experience seems to give answer in the negative.

Total loss of any sense may be either acquired or congenital. We will first consider the former case. We will set aside the two secondary senses, taste and smell, as well as touch in its several forms, allied as it is to the general sensibility; and we will consider only hearing and sight. Instances of acquired blindness and deafness are not rare: quite frequently they produce modifications of character, but such changes are not radical, and the individual remains the same. Congenital blindness and congenital deaf-muteness affect the personality more profoundly. Those who are deaf-mutes from birth, if they have to depend on their own resources and are not instructed in the deaf-mute language, remain in a state of mental inferiority. This has sometimes been exaggerated,* but it is nevertheless incontestable, and it is due to causes so often explained that there is no need to recall them here. The conscious personality falls below the normal stage: but in this case we have an arrest of development rather than an alteration of personality in the strict sense of the term.

As for those born blind, many of them, as we know, are clever and ingenious, and there is no ground for supposing in their case any diminution or alteration of

* See on this point the facts reported by Kussmaul, *Die Störungen der Sprache*, VII. p. 16 et seq.

personality. However odd, to our minds, their conception of the visible world, which they image to themselves according to hearsay only, that does not seriously affect either the nature of their personality or the idea they have of it.

Take the case of Laura Bridgman—the most noted case of sense privation on record, a case minutely studied, and fully detailed.* Here we see a woman bereft at the age of two years of sight and hearing, almost entirely deprived of the senses of smell and taste, and possessing only the sense of touch. Doubtless very great credit is due to the painstaking and intelligent training which has fashioned her mind: nevertheless her instructors could not endow her with new senses, and her one sense of touch had to suffice for all purposes. Now Laura Bridgman is seen to possess an individuality of her own, and a clearly marked character, being of a kindly disposition, almost invariably good-humored, untiring in her efforts toward self-instruction: in short, she is a *person*.

Disregarding the innumerable details involved in the foregoing cases, we may safely conclude that congenital or acquired privation of one or more of the senses involves no morbid state of the personality. In the less favorable cases there is a relative arrest of development, which is remedied by education.

For those who hold the Me to be an exceedingly complex composite—and such do we hold it to be—every change, addition, or subtraction, in its constituent elements affects it more or less. But the aim of our analysis is precisely to distinguish, in these elements, what is essential from what is accessory. What the external senses (touch excepted) bring in is not an essential factor. The senses determine and circumscribe the personality; they do not constitute it. Were it not rash to trust to pure logic in questions of observation and experience, this conclusion might be deduced *a priori*. Sight and hearing are pre-eminently objective: they reveal to us what is without, not what is within. As for touch, a complex sense which many physiologists resolve into three or four senses, this, in so far as it makes us acquainted with the properties of the outer world—in so far as it is an eye for the blind—belongs in one group with sight and hearing; otherwise, it is only

one form of the sense we have of our own body.

It may seem strange to say that paræsthesia and dysæsthesia, of which we are now to treat, *i. e.*, simple sensorial perturbations or alterations, disorganize the Me. Yet observation proves this, and reflection explains it. This work of destruction comes not from them alone; they are but an external episode of an internal disorder that lies deeper, and which affects the bodily sense (or cœnæsthesis). These sensorial disturbances are causes assistant rather than efficient. This the facts will show.

Alterations of personality with sensorial disturbances, but without noteworthy hallucinations, without loss of judgment, are found in certain morbid states. We select as a type the neurosis studied by Krishaber under the title "cerebro-cardiac neuropathy." It matters little whether or no this group of symptoms deserves to be regarded as a distinct pathological unit: that is a question for physicians. † Our investigation is not concerned with it.

First let us consider briefly the physiological disturbances whose immediate effect is to produce a change in the cœnæsthesis, or bodily sense. First, there are disorders of the circulation, consisting principally in an extreme irritability of the vascular system, due probably to excitation of the central nervous system, whence results contraction of the small vessels, ischæmia in certain regions, insufficient nutrition, and exhaustion. Then there is disordered locomotion, dizziness, a constant feeling of vertigo, unsteady gait as from intoxication, hesitating step, involuntary impulse to walk "as though moved by a spring."

Passing from interior to exterior, we find the sense of touch, which forms the transition from general sensibility to the special senses. Some subjects have a feeling as if they no longer weighed anything, or of being very light. Many lose all precise notion of resistance, and cannot by touch alone determine the shapes of objects. They believe themselves to be "apart from the universe": their body, as it were, surrounded by insulating media interposed between it and the outer world.

"There was formed," says one who was so affected, "a sort of murky atmosphere round

* See Mary Swift Lamson, *Life and Education of Laura Dewey Bridgman, the Deaf, Dumb, and Blind Girl*.

† Krishaber, *De la Neuropathie Cérébro-Cardiaque*. Paris, Masson, 1873.

about my person ; nevertheless, I saw perfectly well that it was a clear day. The word 'murky' does not express my thought exactly : in German I should call it 'dumpf,' which means heavy, thick, dull. This sensation was not only visual, but cutaneous. The 'thick' atmosphere enveloped me ; I saw it, felt it ; it was as if I were surrounded by a bad conductor of some kind which insulated me from the outer world. I cannot tell you how impressive this sensation was : I felt as though I had been carried away to an immense distance from the world, and involuntarily I cried out aloud, 'I am far away, far away.' Still, I knew very well that I was not far away, and I remembered distinctly all that had happened to me : but between the moment before and the moment after my attack, stood an interval of immeasurable duration, a distance like that from earth to sun."

The sense of sight is always affected. To say nothing of slight disorders of vision (photophobia, amblyopia), some patients see all objects double : to others, all surfaces seem flat, and to them a man looks like a reliefless silhouette. For many patients, surrounding objects appear to shrink in size, and to retreat into immeasurable distance.

The troubles of the sense of hearing are of a similar nature. The patient does not recognize the sound of his own voice : it seems to come from far away, or to be lost in space, so that it never can reach the ears of those he is talking with ; and their replies are no less difficult to hear.

If we bring together in thought all these symptoms (which are accompanied by physical pain, and by changes in the sense of taste and of smell) we find ourselves in presence of a group of internal and external sensations of a new character, united by their simultaneity in time, but more deeply united by the morbid state which is their common source. Here we see all the elements of a new Me : sometimes a new Me is formed. "I have lost consciousness of my being : I am no more myself"—such is the language of patients as reported by most observers. Some patients go farther and at times fancy themselves to be double ; "A curious thought possesses my mind in spite of myself" said one patient, a civil engineer ; "I believe myself to be double. I feel within me a Me that thinks and a Me that acts." (Krishaber, Obs. 6.)

This process of formation has been so well studied by Mr. Taine, that I need not do the work over again.

"One might best compare the state of the patient to the state of a caterpillar

which, retaining all its ideas and all its recollections of the caterpillar state, should in an instant become a butterfly, with the senses and sensations of a butterfly. Between the old state and the new, between the first Me (that of the caterpillar) and the second Me (that of the butterfly) there is a deep cleft, a complete rupture. The new sensations find no anterior series with which to connect, the patient cannot interpret them, cannot use them : he does not recognize them, for him they are as unknown. Hence two strange conclusions, first, 'I am not' ; the second, a little later, 'I am another.'"*

It is difficult for a sane, well-balanced mind to conceive of so extraordinary a mental state as this. The skeptical observer who looks at the matter from without, does not accept these conclusions, but the patient, who looks at it from within, finds them rigorously correct. For him this continual feeling of vertigo and intoxication is like a permanent chaos, in which the state of normal equilibrium and coördination either cannot exist or at least cannot endure.

If now we compare with the other more or less serious forms this change of the personality *a sensibus læsis*, we find that a new Me is not in all cases formed : when it is formed, it always disappears with the sensorial disturbances. It never supplants entirely the normal Me ; there is an alternation between the two ; the elements of the original Me retain so much cohesion that it resumes at intervals the supremacy. Hence the illusion—but which is not in the strict sense an illusion for the patient—that he is double.

As for the psychological mechanism by which he thinks himself double, that is explained by the memory. I have before endeavored to show that real personality, with its enormous mass of sub-conscious and conscious states, presents itself to our mind in an image or fundamental tendency which we call the *idea* of our personality. This vague conception (*schema*), which represents the real personality much as the general idea of "man" represents a man, or as the plan of a city represents that city, suffices for the ordinary needs of our mental life. In neuropathic patients there must be two images or *schemas* which succeed each other in the consciousness, as the physiological state gives precedence to the new Me or the old. But in the transition

* *Revue Philosophique*, vol. I., p. 289. See also *L'Intelligence*, 4th ed., vol. II., appendix.

from the one to the other, however sudden it may appear, there is a certain continuity. There is no absolute beginning of the one state of consciousness with absolute ending of the other, but with an hiatus, vacancy between. Like all states of consciousness, these have a certain duration: they occupy some portion of time, and the terminal end of one touches the initial end of the other. Nay they trench upon each other, while one is beginning the other still subsists, though vanishing: for a certain period they co-exist. In our opinion it is *during this period of co-existence or of transition*, that the patient thinks himself twain.

Finally it is to be observed that the sensorial disorders are only the result of a deeper disorder that is felt throughout the organism; and that consequently here again the bodily sense plays the principal part in the pathology of personality.

We can now understand how the congenital or acquired suppression of one or more of the senses leaves the personality intact at bottom, while momentary perversions of a less serious aspect transform it. Physiologically considered, we have in the first case a sum of nervous elements condemned to inertia either at their origin or in the course of the individual's life: here the personality is like a weak or a weakened orchestra, which however serves for all necessary purposes. In the second case all the nervous elements subsidiary to the impaired external senses, to muscular sensibility, and to organic and visceral sensibility, have undergone an unwonted modification: it is as with an orchestra in which most of the instruments have changed tone.

A natural transition from sense perceptions to ideas is seen in hallucinations, and we have now to consider the part played by these in anomalies of personality. Let us at the outset recall some general considerations touching the hallucinatory state.* Four hypotheses have been offered to explain it.

1. The peripheric or sensorial theory, which finds the seat of hallucinations in the sense-organs.

2. The psychic theory, which localizes it in the center of ideation.

3. The mixed, or psycho-sensorial theory.

4. The theory which refers hallucination to the perceptive centers of the cortical layer.

Observation teaches us that hallucinations affect now one sense only, again several senses; that usually they extend to both sides of the body, less often to only one side—right or left indifferently; more rarely still they are bilateral but at the same time present a different character at each side: thus one ear may be assailed by threats, abuse, evil counsels, while the other may hear only words of comfort; or one eye may see only things depressing and repugnant, while the other may see gardens full of flowers. The latter cases, those at once bilateral and contradictory, are most interesting for us.

Fortunately we have to explore only a very restricted area of this immense domain. Let us clearly define our subject. In the normal state the individual that senses and thinks is adapted to his environment. Between the group of internal states and relations that constitute the mind, and the group of external states and relations that constitute the outer world, there exists a correspondence, as Herbert Spencer has shown in detail. In the hallucinate this correspondence is destroyed: hence false judgments and senseless acts, that is non-adapted acts. Nevertheless all this constitutes a disease of the reason, not of the personality. No doubt the Me suffers an impairment, but as long as the *consensus* which constitutes it has not disappeared, and has not split in two, or has not alienated a part of itself (as we shall see later) there is no proper disease of personality and the disorders are secondary and superficial. Consequently we may leave out of consideration the immense majority of cases of hallucination.

Neither need we take account of the large number of patients who misapprehend others' personalities—who take the physicians and the nurses in the asylum for their own relatives, or who take their own relatives for the imaginary personages of their ravings. †

The ground being thus cleared, the cases that remain to be studied are not

† For some patients the same individual is alternately transformed into an imaginary personage and kept in his real personality. A woman patient would now recognize her husband, again would take him for an intruder. She had him arrested by the police, and he had much trouble in proving his identity.

* For a full exposition of the question see Binet's important articles in the *Revue Philosophique*, April and May, 1884.

very numerous, comprising only changes of personality with their basis in hallucination. Nearly always there is simply an *alienation* (in the etymological sense) of certain states of consciousness which the Me does not consider as its own, which it makes objective, which it sets outside itself, and to which it at last attributes an actual existence independent of its own.

As regards hearing, the history of religious insanity furnishes many instances: I will cite the simpler cases, those in which the hallucinatory state stands alone at first. A woman was beset by an inner voice "which she heard only in her ear," and which made opposition to whatever she herself willed. The voice was ever for evil, while the patient willed the good. It would at times cry out to her though it could not be heard externally "Take your knife and kill yourself." Another woman, subject to hysteria, at first uttered words that she did not intend to utter, and soon she began to express these alien thoughts in a voice different from her ordinary voice. At first this voice made remarks of an ordinary tenor or not inconsistent with reason: afterward it assumed a habit of negation.

"To-day, after thirteen years, the voice simply confirms what the patient has just said, or comments upon her words, criticises them, ridicules them. The tone of this voice, when the 'spirit' speaks, always differs a little and sometimes differs totally from the patient's ordinary voice, and hence it is that she believes in the reality of the spirit. I have myself often observed these facts."*

As regards sight, aberrations of this kind are less frequent. "A very intelligent man" says Wigan (page 126), "had the faculty of bringing before himself his own double. He would laugh heartily when the double appeared, and the double would laugh too. This was for a long time a matter of amusement for him but the final result was pitiable. The man gradually came to believe that he was haunted by himself. To put an end to this wretched life he arranged his affairs, and unwilling to enter on another year, at midnight of Dec. 31 he shot himself with a pistol in the mouth."

Finally, Dr. Ball† describes the case of a young man who, while traveling

in South America had a sunstroke which "left him very ill: he was unconscious for a month. A few days after having regained his senses, he heard distinctly a man's voice perfectly articulated, uttering the words, 'How are you to-day?' The patient answered and a short conversation ensued. The next day the same question was repeated. This time the patient looked about, and could see no one in the room. 'Who are you?' he said, 'I am Mr. Gabbage,' answered the voice. Some days later the patient had a glimpse of his interlocutor, who thenceforward presented the same features and dress. He saw him always from the front, but only his bust; he always wore a hunting costume, and had the look of a vigorous and well built man of about thirty-six years, with a heavy beard; complexion dark, eyes large and black, and eyebrows strongly marked. Impelled by a justifiable curiosity, our patient would fain know the calling of his questioner and how and where he lived, but the man never consented to tell more about himself than his name."

At last Gabbage grew more and more exacting, ordering the young man to throw into the fire his newspaper, his watch and chain, to poison a young woman and her child, to throw himself out of a third-story window, etc.

In these facts we see the beginning of a *dissolution of personality*. We will further on cite other cases not having their ground in hallucination, and which will enable us better to understand these. That coordination more or less perfect which in the normal state constitutes the Me, is here partially broken up. In the group of states of consciousness which we feel to be our own because they are produced or experienced by ourselves, there is in such cases one which, though it has its source in the organism, does not enter into this *consensus*, stands apart, appears as though foreign to it. Here we have in the order of thought the analogon of irresistible impulse in the order of action—a partial incoördination. †

Certainly these voices and these visions emanate from the patient: why then does he not regard them as his own? It is a difficult question but I will endeavor to answer it. There must exist anatomical and physiological causes which would solve the problem, but unfortunately they are hidden from us.

* Griesinger, *Mental Diseases*, French trans. p. 285. Baillarger reports a similar case in the *Annales Médico-Psych.*, 1st. series, vol. VI. p. 151.

† *Cerebral Dualism*. See HUMBOLDT LIBRARY No. 37. p. 31.

‡ With regard to irresistible impulse as a phenomenon of partial incoördination, see *Diseases of the Will*, Chapter III. (HUMBOLDT LIBRARY No. 52.)

Being ignorant of the causes, we can view only the surface, the symptoms, the states of consciousness, with the signs which interpret them. Take then a state of consciousness (with its organic conditions) having this special character of being local, *i. e.*, one that has the faintest possible relation to the physical and psychic organization. To make my meaning clear by antithesis, take a violent, sudden emotion: it reverberates everywhere, stirs the whole life, physical and mental: there is thorough diffusion. Our case is the reverse of this. Organically and psychically, it has but few connections, and these precarious, with the rest of the individual. It is outside, like a foreign body lodged in the organism, and not sharing in its life. It does not enter the general sensibility (cœnæsthesis) which maintains and unifies the whole. It is a cerebral phenomenon almost without a support, like the thoughts imposed by suggestion in hypnotism. What gives force to this attempt at an explanation is the fact that the morbid state, unless it be removed by nature or by medical treatment, has an irresistible tendency to expand and grow strong at the expense of the original personality, which begins to decline, preyed upon by this parasite. Nevertheless, in this case it retains its original character: it does not constitute a duplication of personality but an alienation.

I offer this effort toward an explanation only as an hypothesis, well aware that our ignorance of the organic conditions of the phenomenon makes definitive proof impossible. In presenting this explanation I have had to anticipate what will later be said with regard to ideas, and which will perhaps furnish us with new arguments in favor of our hypothesis.

We come now to speak of recent experiments on hallucinations; these, in conjunction with other facts, have led certain authors to offer an explanation of double personality so simple as to be palpable, so to speak. These authors show first the functional independence of the two hemispheres of the brain, and thence infer that from their synergy results equilibrium of the mind, but from their disaccord sundry perturbations and finally scission of the psychic individual. There are here two distinct questions that are clearly recognized by many of the authors we are

about to quote, but which have been confounded by others.

A physician of note as a psychologist, Sir Henry Holland, was the first to study in 1840, the brain as a double organ, and to suggest that certain mental aberrations might be due to ill-regulated action of the two hemispheres, seeing that, in some cases, the one seems to correct the perceptions and the feelings of the other. In 1844 Wigan went farther, holding that we have two brains, not one brain, and that "the corpus callosum, instead of being a bond of union between them, is a wall of separation."* Later progress in brain anatomy yielded more positive results, showing the inequality in weight of the two lobes of the brain, their constant asymmetry, differences in the topography of the cortex, etc. Broca's discovery of the seat of aphasia was a new argument of great value. It was further supposed that the left hemisphere might be the principal seat of intelligence and will, while on the right hemisphere would devolve more especially the life of nutrition (Brown-Séquad). I condense this account, which else might be long, to come at once to hallucinations. The occurrence simultaneously of contradictory hallucinations—joyous and sad—attracted the attention of observers. There was something better than observation, too—experimentation; and hypnotism made this possible. The hypnotized subject has three phases: the lethargic, characterized by nervo-muscular excitability; the cataleptic, produced by raising the eyelids of the subject; the somnambule, caused by pressure on the vertex. If during the cataleptic state we lower the right eyelid, we thereby act upon the left brain, and determine a lethargic state of the right side only. Hence the subject finds himself as it were divided in twain: he is hemilethargic on the right side, hemicataleptic on the left. I take from Richer's well-known work an account of what takes place.

"I set upon a table a pail of water, a basin, and soap. As soon as the patient's eye is drawn to these objects, or her hand touches one of them, apparently quite of her own accord she pours water into the basin, takes the soap, and washes her hands with scrupulous

* Wigan, *The Duality of Mind Proved by the Structure, Functions, and Diseases of the Brain, and by the Phenomena of Mental Derangement, and shown to be Essential to Moral Responsibility*. London, 1844. This ill-compacted work does not bear out the promise of its title.

care. If now we close the lid of one of her eyes, the right for instance, the whole right side becomes lethargic, and the right hand is stayed, while the left hand continues to perform its movements. Raise the eyelid again, and both hands resume their action as before." The same thing occurs with the left side. "Put in the patient's hands the box containing her knitting, and she will open it, take out her work, and knit away with remarkable skill. Close one of her eyes, and the corresponding hand stops, the arm falling inert to her side, while the other hand strives to continue, unaided, a work that now is impossible. The mechanism keeps on working on one side, but it modifies its motions in order to make them effective."

The author recounts several instances like this: I will cite only the last one, because it confirms Broca's experiment. One places in the subject's hands an open book directing her gaze upon one of the lines. She begins to read.

"During the reading, if you close the right eye—and by the decussation of the optic nerves, it is the left brain that is now affected—she stops short in the middle of a word or of a phrase. When the right eye is opened again, she forthwith completes the interrupted word or phrase. If on the other hand the left eye be closed, she continues her reading, hesitating a little because she is amblyopic and achromatopsic in the right eye."*

These experiments may be varied. A different attitude is given to the members of each side of the body: then the subject shows, on one side, the expression of one giving a command, on the other, that of one that is smiling and sending kisses. We can produce the hallucinatory state on the right side only, or on the left side only. Or let two persons approach the ear of the subject; one, on the right, speaks of the fine weather, and there is a smile on the right side of the subject's countenance: the other, on the left, tells how it rains, and the left side manifests dissatisfaction, while the labial commissure falls. Or again, while one is suggesting through the right ear the hallucination of a *fête champêtre*, let another at the opposite ear imitate the barking of a dog: then the right side of the face expresses pleasure, the left uneasiness.

These experiments (of which we give only the baldest summary), together with many other facts, lead inevitably to the conclusion that the two hemispheres are

relatively independent; that this does not at all contradict their normal coördination; but that in certain pathological cases this relative independence may become an absolute dualism.

Some authors go farther, and hold that this cerebral dualism suffices to account for all disaccord in the mind, from mere hesitation in choosing between two things, to complete duplication of personality. If we simultaneously will the good and the bad; if we have criminal impulses and a conscience that condemns them; if the insane at times are conscious of their insanity; if the delirious have lucid moments; if finally some individuals believe themselves to be double, the reason is simply that the two hemispheres are in disaccord: the one is sane, the other morbid: one state prevails in the right brain, its opposite in the left—a sort of psychological manicheism.

Griesinger, on encountering this theory, for it was put forward timidly in his day, having cited the facts supposed to make in its favor, and having described the case of one of his patients who "was conscious that he was out of his mind on one side of his head, the right," concludes in these words: "As for me, I am not in the least disposed to accord any great weight to these facts." Have they gained in cogency since? It is very doubtful. In the first place, since the theory rests on the question of number, are there not individuals who believe themselves to be triple? I find at least one case. "I have met," says Esquiros, "in an institution for the insane a priest who, having applied his mind too intently to the mystery of the Holy Trinity, came at last to see around him triple objects. He fancied that he himself was in three persons, and wanted to be served at table with three covers, three plates, three napkins."† Other cases could, I suppose, be found, were one to search for them: but I do not care to take advantage of this case of triplicity, for it is susceptible of many interpretations. The theory in question is opposed by stronger reasons, based upon familiar facts. Its ultimate ground is the perfectly gratuitous hypothesis that the contest is always between two states only. This is flatly contradicted by experience. Who is there that has never found himself hesitating between doing this and doing that and refraining from acting at all? between making a journey northward or

* P. Richer, *Etudes Cliniques sur l'Hystéro-Epilepsie*, p. 391.

† *Revue des Deux Mondes*, 15 Oct., 1845, p. 307.

southward, or remaining at home? Many a time in our lives does it happen that we have to make our choice between three alternatives each one of which necessarily excludes the other two. Where shall we locate the third? for under that strange form the question has been raised.

In some cases of congenital atrophy of the brain which appear to be confirmed by authentic observations, we find individuals possessing from infancy only one cerebral hemisphere, yet their intellectual development has been up to the ordinary standard, and they have been like other human beings. * In such individuals, according to the hypothesis we are combating, there could have been no interior conflict. But it is needless to pursue this criticism further, and I content myself with recalling Griesinger's remark upon a verse in Faust: Not two souls only, but many souls dwell within us.

Idle indeed were this discussion if it did not afford us a view of our subject under a different aspect. These contradictions within the personality, this partial scission in the Me, such as we see them in the lucid moments of insanity and delirium, or in the self-condemnation of the dipsomaniac while he raises the cup to his lips, are not oppositions in space (of one hemisphere against the other) but oppositions *in time*. To borrow a favorite expression of Lewes's, they are successive "attitudes" of the Me. This hypothesis accounts for everything that is explained by the other and besides it explains what that does not.

If one is fully imbued with the idea that personality is a *consensus*, one will easily see how the mass of conscious, sub-conscious, and unconscious states which make it up may at a given moment be summed up in a tendency or a predominant state which, for the person himself and for others, is its expression at that moment. Straightway this same mass of constituent elements is summed up in an opposite state which has become predominant. Such is our dipsomaniac, who drinks and who condemns himself. The state of consciousness predominant at a given moment is for the individual himself and for others his personality.

Clearly three states or more may succeed one another (co-exist apparently) by the same mechanism. We are no longer

restricted to the number two. True, it must be admitted that this inner scission occurs more frequently between two contrary states than between three or more. This is owing to certain conditions of consciousness which we must recall.

Is there actual co-existence of two states of consciousness, or only so rapid a succession of one to the other as to resemble simultaneousness? The question is a very difficult one and has not yet been settled, though it will perhaps one day be settled by the psycho-physicists. Hamilton and others have maintained that we may have as many as six impressions at once, but their conclusion is grounded on very inexact observations. The determination of the duration of states of consciousness by the rigorous processes of physics is a great step in advance. Wundt has endeavored to go further, and to determine by experiment what he justly calls the extension of consciousness (*Umfang des Bewusstseins*), that is, the maximum number of states that it can simultaneously contain. His experiments have had to do only with exceedingly simple impressions (the strokes of a pendulum at fixed intervals punctuated by strokes on a small bell) and therefore they are not in all respects applicable to the complex states we are considering. He finds that "twelve representations form the maximum 'extension' of consciousness in the case of successive relatively simple states." † Experience then, seems to pronounce in favor of a very rapid succession, equivalent to a co-existence. The two, three, or four contrary states would be at bottom a succession.

Further, we know that, to use a comparison that is often employed, consciousness, like the retina, has its "blind spot." Distinct vision is but a small portion of the total vision. Distinct consciousness is only a small portion of the total consciousness. Here we hit the natural, the incurable cause of that illusion whereby the individual identifies himself with his existing state of consciousness, particularly when the same is intense; and of necessity this illusion is far stronger for himself than for others. We see also why (apparent) co-existence is easier for two contrary states than for three; and far easier than for a larger number. This fact is due to the limitations of the consciousness. As we said

* Cotard, *Etude sur l'Atrophie Cérébrale*, Paris, 1868. *Dict. Encyc. des Sciences Médicales*, art. CER-VEAU, pp. 298, 453.

† *Grundzüge der Physiol. Psychologie*, 2d ed., vol. II., p. 215.

before, there is an opposition in time, not in space.

In short, the relative independence of the two hemispheres is not open to doubt: neither may we doubt that the personality is perturbed by disaccord between them. But to reduce the whole matter to a simple division between the left side and the right is an hypothesis not supported by any weighty argument.

A few words with regard to memory. We have no occasion to study memory separately, for it pervades our subject everywhere. Personality, in fact, is not a phenomenon but an evolution; not a momentary thing but a history; not a present nor a past but both. We will not consider what I may call the objective, intellectual memory—the sense perceptions, images, experiences, cognitions stored up within us. All these may disappear, in part or wholly, through diseases of memory, of which we have given many illustrations elsewhere.* We will consider now only the subjective memory—memory of ourselves, of our physiological life and of the sensations or feelings that accompany it. This distinction is purely artificial, but it will enable us to simplify matters.

First, does such a memory exist? One might say that in the perfectly healthy individual the vital tone is so constant that the consciousness he has of his body is but a present ever repeated; but this monotony, if it exists, by excluding consciousness would on the other hand favor the formation of an organic memory. As a fact there are always going on changes—inconsiderable they may be—and as we are conscious only of differences, these are felt. So long as they are faint and partial the impression of uniformity persists, because actions that are continually repeated are represented in the nervous system far more enduringly than ephemeral changes. Consequently the memory of them is organized beneath consciousness, and it is hence all the more firmly based. Here we see the groundwork of our identity. These slight changes act in the long run, producing what is called an insensible change. After ten years of absence, an object, say a monument, is the same to the eye, but it is not the same as regards feeling and sentiment: here it is not the

faculty of sense perception but its accompaniment that has changed. But we have here the state of sanity and health—the simple transformation that is natural to everything that lives and that evolves.

Such is organic memory, such its habit. But now let certain disturbing causes intervene of which we can demonstrate the effects, subjective and objective. There is produced a profound and sudden, or at least a rapid and persistent transformation of the *cœnæsthesis*. What is the result? Experience alone can tell, for in our ignorance of the causes we are reduced to simple empiricism. In extreme cases—and we will not notice others—the individual is changed. His metamorphosis occurs in three principal forms, as regards the memory,

1st. The new personality, after a longer or shorter period of transition, alone remains, the original personality being forgotten (Leuret's patient). This case is rare. It supposes the former *cœnæsthesis* completely done away, or at least forever inactive and incapable of resuscitation. When it is considered that *absolute* transformation of personality, *i.e.*, substitution of one personality for another—substitution complete, unreserved, without a link to connect the present with the past—presupposes a radical and thorough transformation in the organism, one is not surprised to find that it occurs but rarely. I am not aware of any case where the second personality has not inherited at least some small share of the effects of its predecessor—at the very least certain acquired faculties that have become automatic, as the power of walking, talking, and the like.

2d. Usually beneath the new bodily sense (*cœnæsthesis*) that has become organized and has become the groundwork of the existing Me, the old organic memory persists. From time to time it returns to consciousness, weak and faint like some memory of childhood that repetition has not reawakened. Probably this reviviscence is caused by some remainder of the old organic memory that is common to the two: the individual then seems another. The existing state of consciousness evokes a like one, but this has another accompaniment. The two seem *mine* though contradictory of each other. Such is the case with patients who find that everything is as it ever was, and yet that all is changed.

3d. Finally, there are cases of alternation. Here the two subjective memories

* *Diseases of Memory* (HUMBOLDT LIBRARY No. 46.)

—the organized expression of the two cœnæstheses—persist, both in turn becoming predominant. Each is attended by, and sets in action a group of feelings and of physical and intellectual aptitudes that do not exist in the other. Each forms part of a separate *complexus*. The case reported by Azam is a good illustration of two memories alternating.

We can add nothing more without repeating what we have already said, or without heaping up hypotheses. Our ignorance of the causes stops us short. The psychologist is here like the physician who has to deal with a disease of which he can make out only the symptoms. What physiological influences are they which thus alter the general tone of the organism, consequently of the cœnæsthesis, consequently too of the memory? Is it some condition of the vascular system? Or some inhibitory action, some arrest of function? We cannot say. So long as this question remains undecided we are still only at the surface of the matter. Our purpose has simply been to show that memory though in some respects it may be confounded with personality, is not its ultimate basis.

Even in the normal state the same physical situation has a tendency to recall the same mental situation. I have often observed how, on falling asleep, a dream of the preceding night till then forgotten comes back to memory in great detail and very distinct. In traveling, when I leave one town to sleep in another, this recurrence of the previous night's dream sometimes takes place, but then the dream comes back piecemeal, disjointed, and hard to reconstruct. Is this the effect of the physical conditions, in one case alike, in the other slightly different? Though I have not seen this fact mentioned in any work upon dreams, I do not suppose it to be peculiar to me.

But there are certain familiar facts that are more conclusive. In somnambulism, whether natural or induced, the occurrences of preceding states of the same kind that are forgotten during wakefulness come back in the hypnotic state. Of this we have an illustration in the well known case of the porter who while intoxicated mislaid a parcel: on becoming sober he was unable to discover it, but he found it on getting drunk again. Do we not here see a tendency to the formation of two memories, one normal, the other pathological, the two pertaining to two distinct states of the organism, and constituting as it were the embry-

onic forms of the extreme cases already mentioned?

We have already shown in a general way the rôle of ideas in the transformation of personality. It remains to observe this new factor in operation and to ascertain what results it produces *per se* and distinctively. Of the many elements whose *consensus* constitutes the Me, none perhaps can be so easily isolated and studied apart. But we must guard against an ambiguity in terms. For the conscious individual the idea of his personality may be an effect or a cause; a result or a prime factor, a point of arrival or a point of departure. In the normal state it is always an effect, a result, a point of arrival. In the morbid state it is both an effect and a cause. In many of the instances already cited we have seen organic perturbations, whether affective or sensorial, produce such a feeling of exaltation or of depression, that the individual believes himself to be a god, a giant, a great man, or on the other hand a mere automaton, a phantom, a dead man. Clearly these erroneous ideas are a fairly logical conclusion from the inner transformation of the individual—the ultimate formula expressing it. There are other cases of a contrary nature, where the transformation of personality comes not from below but from above; where it is not completed in the brain but where it begins in the brain; and where accordingly the idea is, not a conclusion, but a premise. No doubt it were rash to assert that in many instances where an erroneous idea becomes the starting-point for a change in the Me, this has not underlying it and before it in time an organic or an affective perturbation. Indeed it must be affirmed that such is the case always; even in the hypnotized subject, in whom the personality is changed by suggestion. Between the two forms of metamorphosis indicated above there exists no clear line of demarkation: the term “ideal metamorphosis of personality” is only an *a priori* denomination. Having made this reservation, we will now examine this new aspect of our subject, starting as usual from the normal state.

A very common occurrence is the engrossment of the personality by an intense fixed idea. So long as this idea occupies the consciousness it is hardly an exaggeration to say that it is the individual. When a man is wrestling con-

tinually with a problem, or intent on working out an invention, or bending his energies toward the production of some original work in any field, his entire mental resources, his whole personality, are drawn upon for the benefit of one idea. In such cases, a man is overmastered by his dominant idea, that is, he is an automaton: he is in an abnormal state; there is a disturbance of equilibrium. Of this we have proof in the innumerable anecdotes that are current the world over about inventors, whether well balanced or half-crazed. And it may be remarked in passing that a fixed idea is a fixed sentiment, or a fixed passion. The fixed idea gets its intensity, its stability, its tenacity from some longing, some emotion of love or hatred, some consideration of gain. Ideas are ever servitors of the passions, but they are like those masters who always obey the while they think they command.

So far we have no change of personality, but only simple deviation from the normal type, or better, the schematic type, where *ex hypothesi* the organic, the affective, and the intellective elements produce a perfect *consensus*. There is hypertrophy at one point, atrophy at other points, conformably to the law of compensation. Let us consider morbid cases. Outside of the artificial alterations produced during hypnotism it is difficult to find any great number of cases in which the starting-point is indisputably an idea. But I think I am justified in classing among changes of personality having their source in the intellect the phenomena of lycanthropy and of zoanthropy; once so common, now rare. At all events, in every instance of which we have authentic record* the mental debility in the *lycanthrope* is so great, and so near akin to stupidity, that one is disposed to see here a case of reversion, of return to the purely animal individuality. We may add that as these cases are complicated with disorders of the viscera, and with hallucinations of touch (*cutanées*) and of sight, it is not easy to decide whether they are the effects of a preconceived idea, or whether they themselves produce it. Still it must be remembered that lycanthropy has sometimes been epidemic, that is, it must have begun, at least among the imitators, with a fixed

idea. Finally, this particular malady disappeared when men had ceased to believe in it—when the thought that he was a wolf could no longer find a lodgment in a man's brain.

The only perfect instances of transformation of the personality by ideas (*transformation idéale*) are those already mentioned, where men believe themselves to be women, and *vice versa*, without presenting any sexual anomaly that could account for this metamorphosis. The influence of an idea appears also to be initiative or preponderant with the possessed, demoniacs. It often acts upon the exorcist by contagion. To cite one instance of this, Father Surin, so long mixed up with the well-known doings at the Loudun Ursuline nunnery, was convinced that he had two souls, and sometimes, as it would appear, even three.†

In short, transformation of personality through the dominance of an idea are not very frequent, and this affords new proof of what we have again and again repeated: that personality comes from the more fundamental psychic elements. In the higher nerve centers it attains its unity and there does it come to full consciousness of itself, there it reaches perfection. If by a mechanism acting in the reverse direction it proceeds from above downward, the result is superficial, precarious, momentary.

Of this we have a demonstration when artificial personalities are produced in hypnotized subjects. The observations of Ch. Richet on this subject are full and conclusive.‡ I will sum them up briefly.

† He has left us a detailed account of his mental state in his *Historie des Diabes de Loudun*, p. 297 et seq.: "I cannot describe to you what passes within me during this time [*i. e.*, when the demon passes from the body of the possessed nun into his body] and how this spirit unites with mine, without depriving me either of the cognition or of the liberty of my soul, nevertheless making himself like another *me*, and as though I had two souls whereof one is dispossessed of its body and of the use of its organs and stands aside, looking on while the intruder makes herself at home. The two spirits fight on one field, which is the body, and the soul is as it were divided in twain: in one part of her, she is the subject of the diabolic impressions: in the other, she is the subject of the motions that are proper to her or that God gives her. When I would, by the motion of one of these two souls, make the sign of the cross upon my lips, the other turns my hand away very rapidly, and seizes my finger with the teeth to bite it in its rage. * * When I would speak my speech is checked; at the mass I am stopped quite short; at the table I cannot raise a morsel to my mouth; at confession, I suddenly forget my sins, and I feel the devil going and coming within me, as in his own house."

‡ *Revue Philosophique*, March, 1883. He gives some later observations in his work, *L'Homme et l'Intelligence*. See also Carpenter, *Mental Physiology*.

* See Calmeil, *De la Folie Considérée sous le Point de Vue Pathologique, Philosophique, Historique, et Judiciaire*, vol. 1, book 3, chap. 2, and book 4, chap. 2.

The hypnotized subject (usually a woman) is made to believe herself to be, now a peasant, again an actress, or a general, an archbishop, a nun, a sailor, a little girl, and so forth; and she acts her part without any misgiving. Here the psychological data are perfectly clear. In this state of artificially produced somnambulism the real personality is intact; the organic, affective, and intellectual elements have undergone no considerable alteration, but they all remain *in posse*. A certain not well understood state of the nerve centers, an arrest of function, prevents them from passing into act. By suggestion an idea is evoked; instantly by the mechanism of association, this awakens analogous states of consciousness, and no others; and in connection with them—always by association—the appropriate gestures, acts, speech and sentiments. In this way is constituted a personality external to the real personality, made up of borrowed elements and depending on automatism. This experiment shows what an idea may do when freed from control by other ideas, but at the same time reduced to its own sole forces, and no longer supported and aided by the totality of the individual.

In some cases of imperfect hypnotism dualism is produced. Dr. North, professor of physiology in the Westminster Hospital, says, in speaking of the period of hypnotization when he was being influenced by the fixing of the gaze:—"I was not unconscious, but it seemed as if I lived as two beings. I fancied that an inner Me was alive to all that was passing, but that it took no part in the acts of the outer Me, nor had any care to control them. The repugnance or the inability of the inner Me to direct the outer Me seemed to increase as the situation was continued."^{*}

^{*} Hack Tuke, *On the Mental Condition in Hypnotism*, published in the *Journal of Mental Science*, April, 1883. We have also in this article the case of a physician who, during a troubled slumber after some twenty hours of climbing among the Alps, dreamt that he was twain: one Me had died, the other was making the autopsy. In some cases of intoxication and of delirium, the psychic coordination disappears, and there is a kind of scission of the personality in two. See the articles by Dr. Azam on changes of personality (*Revue Scientifique*, Nov. 17, 1883) and of Dr. Galicier (*Revue Philosophique*, July, 1887). Taine gives a curious case of semi-pathological incoordination:—"I have seen a person who, while singing or talking writes, without looking at the paper, consecutive phrases, even whole pages, quite unconscious of what she is writing. In my opinion she is perfectly sincere, yet she declares that when she comes to the end of the page she has no idea what

Can this inner personality—the true personality—ever be entirely suppressed? Can the individual's proper character be reduced to nought, so as to be transformed into its opposite? No doubt it can: the operator, by persistent enforcement of his authority, succeeds in doing this, after more or less resistance. Richet impressed upon a woman who was a very strong Bonapartist strict republican convictions. Braid having hypnotized a "teetotaler," whose sobriety was without reproach, assured the man again and again that he was drunk. "This assertion was strengthened by a feeling of staggering (produced by muscular suggestion) and it was amusing to see the man wavering between this imposed idea and the conviction resulting from his habits." This momentary metamorphosis however is perfectly innocuous. As Richet justly remarks:—"In these curious modifications what changes is simply the outer form, the habits and general demeanor, and not the individuality proper." As for the question whether by repeated suggestions to susceptible subjects, we might be able at length to produce a modification of the character, that is a problem to be solved by experiment alone, and that is beyond our present purpose.

Here perhaps is the place to note the fact of the *disappearance of personality*, a phenomenon that has been described by the mystics of every age, according to their own experience, and often in elegant language.† The pantheistic meta-

she has set down on the paper. On reading it she is amazed, sometimes alarmed. The handwriting differs from her ordinary style. The movement of the fingers and of the pencil is stiff and seems automatic. The writing always ends with a signature, the name of one who is dead and it bears the impress of a mental background [*arrière-fond mental*] that the author would be unwilling to divulge." (*De l'Intelligence*, 3d edition, preface).

† I will quote only one of these descriptions, and that one because by its style of language and its date it comes nearest to our own time. "I seem to have become a statue on the banks of the stream of time, and to be assisting at some mystery, whence I shall go forth aged or ageless. I feel myself to be without name, impersonal, with the staring eyes of a corpse, with mind vague and universal like nothingness or the absolute: I am in suspense, I am as if non-existent. In such moments it seems to me that my consciousness withdraws into its eternity * * * it sees itself in its very essence, superior to every form containing its past, its present, and its future [sees itself as the] void which encompasses all, an atmosphere (*milieu*) invisible and fecund, the virtuality of a world which detaches itself from its own existence to regain itself (*se ressaisir*) in its pure inwardness (*intimité pure*). In those sublime moments the soul re-enters herself, goes back again to indetermination; she becomes *retro-voluted* (*Sit venia verbo*). The original has *s'est réimpliquée*. Translator) beyond her own life, she becomes again a divine embryo. All is ef-

physicians, too, without attaining to ecstasy, speak of a state in which the mind thinks of itself "under the form of eternity," appears to itself as outside of time and space, as free from all contingent modality and forming one with the infinite. This psychological situation, though infrequent, must not be forgotten. To me it seems as an absolute engrossment of the mental activity by a single idea (in the mystics a positive one, negative in the empirics) which idea, from its high degree of abstractness, and from its being exempt from all determination and limitation, contradicts and excludes all feeling of individuality. Let but one sensation, however commonplace, intervene, and the illusion disappears. This state is neither above the personality nor below it, but without and beyond.

To sum up, the states of consciousness called ideas are only a secondary factor in constituting personality and in changing it. Ideas play their part, but it is not a predominant one. These results do not agree with the time-honored teachings of psychology. Ideas have an objective character: hence they cannot express the individual as do his desires, his feelings, his passions.

CHAPTER V.

DISSOLUTION OF PERSONALITY.

To complete our review of the facts, we have yet to treat of alterations of personality in progressive dementia caused by old age, general paralysis, and all other morbid causes. If in the normal state personality is a psycho-physiological coördination of the highest degree possible, which endures amid perpetual changes and partial and transitory incoördinations (such as sudden impulses, eccentric ideas, etc.), then dementia, which is a progressive movement toward physical and mental dissolution, must manifest itself by an ever increasing incoördination till at last the Me disappears in absolute incoherence, and there remain in the individual only the purely vital coördinations—those best organized, the lowest, the simplest,

faced, dissolved, dissipated, resumes the primordial state, is immersed again in the original fluidity without form, or angles, or fixed contours. This state is contemplation, not stupor: it is neither painful, nor joyous, nor sad; it is beyond all special feeling and sentiment, as it is beyond all finite thought. It is the consciousness of Being (*l'être*) and the consciousness of the omnipossibility latent in the depths of that Being. It is the sense of spiritual infinitude." Amiel, *Journal Intime*, 1856.

and consequently the most stable, but these in turn disappear also. And it is perhaps in these states of progressive and inevitable dissolution alone that we find instances of double personality in the strict sense, that is, of *co-existent* personalities. In the course of this work we have seen cases of successive personalities (cases mentioned by Azam, Dufay, Camuset); of a new personality supplanting another that is forgotten or thrust out and held to be extraneous and foreign (the case cited by Leuret, and that of the soldier of Austerlitz); of an invasion of the normal personality by unwonted sensations which it resists with more or less success, and which *at times*, and *momentarily* lead the patient to think himself twain (cases noted by Krishaber, etc.) But in the subjects of dementia disorganization becomes organized: the demented are double in personality, think themselves double, act as double personalities. This admits of no doubt. They retain no trace of that indecision which, in the numerous cases we have cited, shows that the normal personality (or what remains of it) possesses some remainder of strength which, weeks or months later, will insure its return. To the demented it seems as natural to be double as to us to be of one personality. Such individuals have no skepticism as to their own state and do not regard the opinions of others. Their mode of being, given to them by their consciousness, seems so clear to them, so evident, as to be above all question. This point is worthy of notice because it shows in these morbid forms of personality, that spontaneity of affirmation and of action which is characteristic of every natural state. Here are two cases of this kind:

A retired soldier, D—, who afterward was a police sergeant, having been several times struck on the head, lost his memory by degrees, and at last was sent to an asylum. His mind becoming more and more affected, at last he came to think himself double.

"In talking he always uses the pronoun *we*: *we* will go, we have made a long march, etc. He uses this form of speech, he says, because there is another with him. At the table he says, 'I have had enough, but the other is still hungry.' Sometimes you see him running, and if you ask why, the answer is that he would rather sit still, but 'the other' makes him run. One day he attempted to choke a child to death, saying it was not himself but 'the other' that was to blame. At last he attempted his own life to

slay 'the other,' whom he supposes to lie hid in the left side of his body. Hence he calls 'the other' the left D— while he himself is the right D—. This patient soon fell into dementia.*

A case reported by Langlois exhibits a still lower grade.

"The man G— is imbecile, loquacious, with no hesitation in utterance, no paralysis of the limbs, and no disturbance of the cutaneous sensibility. Though he talks continually he does but repeat the same stereotyped phrases. He always speaks of himself in the third person, and almost every morning greets us with 'G— is sick, he must go to the infirmary.' Often he goes upon his knees, and gives himself a sound pummeling; then bursts out laughing, and rubbing his hands exclaims, 'G— has been bad, he has had to do penance.' Often he will take up his wooden shoe, and beat himself violently on the head, or he will bury his nails in his flesh, or will scratch his face. These fits of rage come on suddenly, and while he is disfiguring himself his countenance is expressive of anger, but it wears a look of satisfaction, as soon as he has done correcting the other. At times when he is not overwrought by these imaginary resentments, we ask him 'Where is G—?' 'Here he is,' he answers, striking his breast. We touch his head, asking whose that is. 'That,' he answers, 'is the pig's head.' 'Why do you beat it so?' 'Because I must punish the pig's head.' 'But you just now struck G—.' 'No. G— is not a bad boy to-day: it is the pig's head that has to be beaten.' For many months we asked him the same questions, and the answers were ever the same. Generally it is G— that is displeased, but sometimes it is the other, and then it is not the head that is punished.†

A certain subject of general paralysis, in a condition bordering on dementia, used to be continually giving himself advice, or reproaching himself. "Mr. G—," he would say, "you are aware that you have been placed in this institution, and here you are. We tell you that we have no hope whatever of you," etc. As the general paralysis progressed his words became less intelligible, but in his raving this conversation with himself could always be made out. Sometimes he both asked the questions and answered them. When dementia had reached almost the last degree, he kept up the same practice. He would cry out, and show signs of agitation, but immediately growing calm would say in a low voice, and with a sig-

nificant gesture, "Won't you be still; speak low." Then he would answer, "Yes, I am going to speak low." "Once we found him very busy, making all the motions of tasting [wines, etc.], and spitting out. We asked him, 'You are amusing yourself, Mr. G—?' 'Which?' was his reply, and then he relapsed into incoherence. This reply, repeated here literally, may seem to be the result of chance, but it accords so well with the quality so long observed in this patient, that we have deemed it worthy of mention.†

In the following case the dissolution of personality is presented in a new aspect: the individual has no consciousness of a portion of himself, which is become foreign to him, or hostile. We have already, while speaking of hallucinations, seen the patient coming by degrees to embody his hallucinations, and finally giving them objective existence. In the demented case is more serious. The acts and states that are perfectly normal for a person of sound mind and that have none of the morbid or imaginative characters of hallucination, are for the subject of dementia something external to himself, nor is he conscious that he is himself their cause. How may we account for this curious situation without supposing a profound change in the cœnæsthesia, and that certain portions of the body are no longer represented—or sensed—in the ruined brain. The sense of sight remains, as experience proves, but the patient sees his own movements as an external, antagonistic phenomenon which he attributes neither to himself nor to others; which he notices passively without more ado, because his internal sensations being effaced and his reasoning power reduced to impotence, there is no means of correcting this incoördination.

Then we have the case of a general paralytic in the period of dementia, whose speech was almost unintelligible, and of

† Descourtis, *Du Fonctionnement des Opérations Cérébrales, et en particulier de leur Dédoublement dans les Psychopathies*, Paris, 1883, p. 33. Possibly this second personality which advises and admonishes the other is only the purely passive reproduction of the phrases addressed to the patient by his physician or his attendants. It may be remarked that not seldom the demented speak of themselves in the third person. The same is seen in young children, and it has been accounted for by the fact that their personality is not yet formed. In my opinion we have here simply imitation. The infant is used to hearing such remarks as these: "Paul has been bad, he must get a whipping," etc. He thus learns to speak of himself in the same way. Is the use of the third person by some subjects of dementia a sign of reversion?

* Jaffe, *Archiv für Psychiatrie*, 1870.

† *Annales Médico-Psychologiques*, vol. VI., p. 80.

whose notions of the external world but little remained.

"One day he was employed in picking peas. Though inexpert, and naturally right-handed, he employed only the left hand. Once the right hand came forward as though to take its share of the work, but hardly had it touched the peas when the other hand came down upon it, seized it and gave it a hard squeeze. The patient's countenance meanwhile bore an expression of anger and he repeated in a tone of authority, 'No, no.' His body trembled and shook with passion and it was plain that a violent struggle was going on within him. On another occasion he had to be tied down in an armchair. His countenance grew clouded, and seizing his right hand in his left, he exclaimed: 'There! It is all your fault; on your account they have tied me here,' and he struck the offending hand again and again. Nor were such occurrences exceptional. Many times it was observed that on the right hand quitting its habitual state of inactivity the patient checked it with the left. He would become angry and excited, and would beat it with all the strength he had."*

Some demented patients blame their fellow patients for the noise they themselves make, and complain of being disturbed by their cries. Finally, we will quote the case, observed by Hunter, of an old man, whose faculties were very much impaired. He always referred to the present time the occurrences of his early life. Though he was capable of acting correctly upon certain impressions, and of referring them to the portions of the body affected by them, he habitually attributed his own sensations to those around him. Thus he would tell his keeper and the attendants that he was sure they were hungry or thirsty. But when food or drink was offered him, it became apparent that this absurd idea had been suggested to him by his own feeling of hunger and thirst, and that the word *they* referred to himself, not to others. He had frequent violent fits of coughing, after each of which he would resume the thread of his conversation, first expressing in appropriate and sympathetic terms his concern on account of his friend's complaint. "It grieves me," he would say, "to see *you* suffering from so troublesome and so distressing a cough."†

Little by little all these cases steadily advance toward absolute incoördination and complete incoherence. They come

to resemble congenital imbecility that has never been able to reach the mean level of human personality. In the gradual and progressive coördination which constitutes normal man, the idiot has met with arrest of development. In him the evolution has not preceded beyond the early stages: it has made provision for the physical life and some few elementary manifestations of the psychic life; but the conditions of an ulterior development are lacking. We have now in conclusion to consider this fact of coördination as the groundwork of personality.

But we must first attempt a rapid classification of the perturbations of personality of which we have given so many illustrations, all so different from one another that it might seem impossible to refer them to a few fundamental types.

Though in the normal state the bodily sense (cœnæsthesis) undergoes different changes in the course of one's life—in the evolution which goes on from birth to death—this change is usually so slow, so continuous, that the assimilation of new sensations proceeds little by little, and the transformation is brought about insensibly, so producing what we call identity, *i.e.*, apparent permanence amid insensit variations. Nevertheless all serious maladies, as well as all profound changes (puberty, change of life) import more or less of indecision: between the new state and the old there is not immediate fusion and as it has been well expressed, "at first these new sensations present themselves to the old Me as an extraneous Thee." But should the general bodily sense (cœnæsthesis) be modified suddenly; should there be a large instantaneous influx of unwonted states, then the fundamental element of the Me is completely transformed: the individual is parted from his prior personality, and he appears to himself like another. More usually there is a period of disturbance and incertitude, and the break is not instantaneous. When the morbid state has become fixed, one or other of these three principal types of diseases of personality will be presented:

1. The general bodily sense is changed completely. The new state serves as basis for a new psychic life (new ways of sensing, perceiving, thinking, hence a new memory). Of the former Me there remain only the completely organized processes (language, manual dexterity, power of walking, etc.), activities that are

* Descourtis, *Op. cit.*, p. 37.

† Hunter, quoted by Winslow, *Obscure Diseases of the Brain*, p. 278.

purely automatic and almost unconscious, faculties that are like slaves ready to serve any master. But it must be remarked that in reality this type is subject to exceptions. Sometimes a portion of the automatic acquisitions are not transferred to the new Me. Again, at long intervals, some few traces of the old personality reappear, and produce momentary indecision in the new. Looking at the matter as a whole, and disregarding slight deviations, we may say that here we have an *alienation* of personality, the old personality having become alien to the new, so that the individual has no knowledge of his former life, or, when he is reminded of it, regards it objectively, as something apart from him. Of this we see an excellent example in the woman inmate of La Salpêtrière who ever after her forty-eighth year spoke of herself as "the person of myself" (*la personne de moi-même*). She gave a fairly correct account of her former personality, always, however, identifying it with another. "*La personne de moi-même* does not know the one that was born in 1779"—her former personality.* The case of Father Lambert belongs also to this type. Hack Tuke tells of a patient at the Bedlam hospital who had lost his Me, that is, the Me that was familiar to him, and would often go looking for himself under his bed. †

2. The second type has for its fundamental character *alternation* of two personalities, and to this type in particular properly belongs the current designation of double consciousness. As we have said, there are transition forms intermediate between the first type and this one, but at present we are concerned only with what is clear and well defined. The physical cause of this alternation is very obscure, unknown we may say. At the point where the new personality first appears, this case differs in nothing from those of the preceding class: the difference begins when the first personality reappears. The hypothesis seems inevitable, that in these subjects (who as a rule are hysterical, that is to say instable in a high degree) there exist, with secondary variations, two distinct habits in the physical life, each serving as groundwork for a psychic organization. The hypothesis appears all the more probable when it is remarked that the alternation bears upon

character, the thing that in personality is inmost, and which most fully expresses the individual nature. (Cases observed by Azam, Dufay, Camuset.)

Of this alternation type too, we have different forms. Sometimes the two personalities know nothing of each other (Macnish). Again, one touches the whole life, while the other is but partial: such is the case observed by Azam. In this case, the most instructive of all because it now covers a period of twenty-eight years, we see the second personality continually encroaching upon the first. In the beginning, the duration of the first personality was very protracted, but by degrees it has come to be shorter and shorter, so that in time it promises to disappear entirely, leaving the second to stand alone. It would hence appear that this state of alternation, when prolonged, tends necessarily to be converted into the first type: thus it holds a place intermediate between the normal state and complete alienation of personality.

3. The third type is more superficial: I will call it *substitution* of personality. To this type I refer the rather frequent case of individuals imagining themselves to have changed from one sex to the other—from man to woman, and *vice versa*, or from ragman to king, etc. The state of certain hypnotized subjects already mentioned may serve as an example of this whole class. The alteration is rather psychological, in the narrower sense of the term, than organic. I do not for a moment suppose that it arises, or that it persists, without material conditions. I mean only to say that it is not caused and maintained, like the other two groups, by any profound modification of the cœnæsthesis, involving a complete transformation of the personality. It arises from the brain, and not from the inner recesses of the organism. It is a local rather than a general disorder—the hypertrophy of a fixed idea, which makes impossible that co-ordination which is necessary for the normal psychic life. Hence, while in alienation and alternation of personality all conspires and co-operates, exhibiting the inner unity and logic of the organic processes, here, oftentimes, the one who says he is a king admits that he has been a laborer, and the imaginary millionaire that once he earned only a couple of francs a day. Even outside of cases where the incoördination is manifest, we see that a fixed idea is a weak excrescence which does not at all imply total transformation of the individual.

* See the full details in Leuret, *Frag. Psychol.* pp. 121-124.

† *Journal of Mental Science*, April, 1883.

This classification, proceeding from the gravest forms to the slightest, does not pretend to be rigorously exact. It may serve to array the facts in something like order, and to show how they differ, and especially to show once again that personality has its roots in the organism, undergoing like it change and transformation.

CHAPTER VI.

CONCLUSION.

IT follows necessarily from the doctrine of evolution that the higher forms of individuality must have arisen out of the lower by aggregation and coalescence. It follows, also, that individuality in its highest degree, in man, must be the accumulation and condensation in the cortical layer of the brain, of elemental consciousnesses that originally were autonomous and dispersed through the organism.

The different types of psychic individuality in the animal scale, from lowest to highest, cannot be described and defined save by a zoo-psychologist who makes his way cautiously through the tangle of facts, often trusting to conjecture. Hence we cannot do any more here than to note a few forms, in view of the principal aim of this work, which is to show that the ascending progress toward higher individuality is ever toward greater complexity and coördination.

There is no plainer term than "individual," when there is question of a man, a vertebrate animal, even an insect: but no term is more obscure as you descend the scale: on this point all zoologists are agreed.* According to its etymology, that is individual (*individuum*) which is not divided. The individual, in this sense, must be sought far down in the scale. While there are no limits to the dimensions of inorganic compounds (crystals), "every protoplasmic mass having a maximum diameter of a few tenths of a millimeter splits up spontaneously into two or more distinct masses equivalent to the mass from which they come, and which in them is reproduced. Hence, protoplasm does not exist save in the individual state, having a limited magnitude,

and hence it is that all living things are necessarily made up of cells."† Life never attains any considerable augmentation except through the indefinite repetition of this fundamental theme, by the aggregation of an infinite number of these minute elements, true types of individuality.

The living, homogeneous matter which constitutes these elemental, primordial individualities, expands, contracts, draws itself out in slender filaments, creeps up to substances capable of affording it nourishment, involves them in its own substance, decomposes them, and assimilates their *débris*. We hear of "rudiments of consciousness" in this connection—of a sort of will reaching its determinations through external stimulations, and of vague wants. One may employ the term for want of a better, but let him not forget that it has for us no precise significance. In an homogeneous mass presenting not the slightest trace of differentiation, and in which the essential vital properties (nutrition, generation) are in a diffused, indistinct state, the sole representative (and it is a lowly one indeed) of psychic activity is the irritability common to all living things, and which will later, in the course of evolution, become general sensibility, special sensibility, and so on. May we call it a consciousness?

The first step toward a higher individuality consists of an association of individuals almost completely independent of one another. "The forced contiguity, the continuity of tissues, the nearly constant unity of the digestive apparatus, establish between them a number of relations, and these prevent the several individuals from remaining altogether strangers to what is taking place among their next neighbors: such is the case with sponges, colonies of Hydra polypes, corolla polypes, bryozoa, and some colonies of ascidia."‡ But this is, properly speaking, only a juxtaposition of a number of contiguous, homogeneous consciousnesses, having between them nothing in common save the limitation of their aggregate in space.

The rise of the *colony* individuality, and of the *colony* consciousness marks a great step toward coördination. The colony, made up of elemental individuals, has a tendency toward transformation into an

* See in particular Hæckel, *General Morphology*, I., p. 241 (French trans.); Gegenbaur, *Comparative Anatomy*, p. 24 et seq. (French trans.); Espinas, *Sociétés Animales*, 2d ed., Appendix II.; Pouchet, *Revue Scientifique*, 10 Feb., 1883.

† Perrier, *Les Colonies Animales et la Formation des Organismes*, Paris, 1881, p. 41. According to Cattaneo, *Le Colonie Lineari e la Morfologia dei Molluschi*, the division is carried farther still.

‡ Perrier, *Op. cit.*, p. 774; Espinas, *Sociétés Animales*, section 2.

individuality of a higher order, in which there shall be division of labor. In colonies of Hydractinia we find seven different kinds of individuals—the nurses, the sexed individuals (male, female), those which capture prey, etc. In the Siphonophora and allied types, the faculty of locomotion is perfectly centralized: the individuals seem independent as long as the animal lets the common axis float about, on which they are implanted: but when any danger impends, or if the animal is to perform any complex movement, then the axis contracts, carrying with it all the polypes. The Prysalia knows how to quicken or to slacken its movement, can at will rise above the surface, or descend below it, can move straight ahead, or turn about, all its organ-individuals concurring to perform these complicated acts. The wandering life of these creatures, as Perrier remarks, favors the development of individuality.

“From it necessarily results greater interdependence of the individuals; closer ties are formed between them; impressions produced upon any part of the whole must necessarily be transmitted to the locomotive air-bladders; and the movements of these must needs be coördinated, else all is disorder. Hence arises a sort of ‘colony consciousness,’ and this tends to produce a new unity, to form what we call an individual.”*

In other colonies the common consciousness has its rise in a different way. In Botrylus, a genus of Tunicata, there is a common orifice, which is the cloaca around which all the individuals are arranged. Each of these sends out in the direction of the cloaca a tongue-shaped process provided with nerves, whereby communication can be established permanently between all the members of a group. †

“But it by no means follows that because a colony gains the notion of its existence as a colony, therefore each of the individuals composing it loses its particular consciousness. On the contrary, each of these continues to act as if it stood alone. In some star-fishes, each severed branch keeps moving on, or turns aside, as the occasion may require: in short, appears to be conscious. Nevertheless, the consciousness of each of the rays is subordinate to the consciousness of the star-fish, as is proved by the harmony between the movements of the several parts when the creature changes position.” ‡

It is difficult for man, in whom centralization is carried to so high a degree, to have anything like a clear idea of a mode of psychic existence in which partial individualities co-exist with a collective individuality. We might find some analogon in certain morbid states. So too it might be said that the human individual has consciousness of himself both as a person and as a member of the body social. But I do not wish to make comparisons that might be contested. But looking at the question objectively and from without, we see that this “colony consciousness,” however imperfectly coördinated, however intermittent it may be in the beginning, has profound significance as regards evolution. It is the germ of the higher individualities, of personality. It will, little by little, rise to the highest grade, turning to its own advantage all these special individualities. In the political order we see a like evolution in thoroughly centralized governments. There the central power, at first very weak and hardly recognized, oftentimes inferior to that of the constituent parts, or provinces, gains strength at their expense, and by degrees absorbs them.

The development of the nervous system, which is the coördinating agency *par excellence*, is the visible sign of an advance toward a more complex and a more harmonious individuality. But this centralization is not brought about in a moment. In the Annelida the brain-like ganglia which send out nerves to the organs of sense seem to perform the same functions as the brain in vertebrates. but these ganglia are by no means fully organized. The psychological independence of the several rings is very evident. “Consciousness, while pretty distinct in the brain, seems to grow fainter in proportion as the number of rings is greater. Some species of Eunice, which often attain a length of five or six feet, bite the posterior part of their own bodies without appearing to notice it. To this diminution of consciousness no doubt we must attribute the fact that Annelids kept in captivity, under unfavorable conditions, readily prey upon themselves.” In linear colonies, the individual that holds the front position, since it has to give the initiative, to advance or to retreat, to modify the gait of the colony which it draws after itself, becomes a *head*; but the term *head* is here employed by zoologists analogically only, and we must not suppose it to have the same meaning as when we speak of the

* Perrier, Op. cit., p. 232.

† Id. *ibid.*, p. 771.

‡ *Ibid.*, pp. 772, 773.

head of an insect or of any articulate animal. The individuality it represents is so indefinite that in certain annulates, made up of forty rings or more, we may see the head of a sexed individual appearing at the level of the third ring, acquiring tentacles and antennæ, then separating itself from the original individual, and setting up for itself.*

For details the reader is referred to special treatises. As regards the higher animals, there is no need to dwell upon the subject: in them individuality, in the received meaning of the term, is established, being represented by the brain, which becomes more and more predominant. This *excursus* over the domain of zoology will not have been in vain if it shall have taught us that this coördination, of which we have had so much to say, is not a mere subjective view, but on the contrary an objective fact, visible and tangible; and that, in the words of Espinas, the psychic individuality and the physiological individuality are parallel—that consciousness becomes unified or diffused with the organism. Nevertheless the term “consciousness,” or “psychic individuality” is highly ambiguous. If the psychic individuality is, as we maintain, simply the subjective expression of the organism, then the farther we go from the human type, the greater is the obscurity that surrounds us. Consciousness is a function that may be compared to generation, inasmuch as they both express the whole individual. Grant that the most elementary organisms possess a consciousness, and that like all their vital properties, and generation in particular, it is diffused throughout their physical structure: now as regards generation, we see that this function, as the animal grade rises, becomes localized, and appropriates a part of the organism, and that this part, after countless modifications, becomes, with respect to that function and that alone, the representative of the whole organism. The psychic function takes a like course. In its highest grade it is strictly localized, and has appropriated to itself a part of the organism which becomes, for that function and for it only, the representative of the whole organism. In virtue of a long series of successive transfers of function, the brain of the higher animals now concentrates in itself most of the psychic activity of the colony: it has been entrusted, so to speak, with one function after an-

other, till at last its associates have made complete abdication in its favor.† But take at random any species of animal, and who shall say to just what degree this delegation of psychic functions has in it proceeded. Physiologists have made many experiments upon the spinal cord in frogs. Is its psychic value relatively the same in man? We may well doubt it.

Return we to man, and let us consider first his purely physical personality. We will for the nonce eliminate all states of consciousness, and will consider only the material groundwork of personality.

1. There is no need to show at length the very close relations subsisting between all the organs of the so-called vegetative life—the heart, vessels, lungs, intestinal canal, liver, kidneys, etc.—however foreign they may appear to be one to another, and however much engrossed with their several tasks. The multitudinous agents in this coördination are centripetal and centrifugal nerves of the great sympathetic and of the cerebro-spinal system (the difference between these two tends to disappear) together with their ganglia. Is their activity restricted to the simple molecular disturbance which constitutes the nervous influx, or has it also a psychic, conscious effect? No doubt it has such an effect, in morbid cases: it is then *felt*. In the normal state it simply calls forth that vague consciousness of life of which we have so often spoken. But vague or not, that is of no importance. May we maintain that these nerve actions, which represent the totality of life, are the fundamental facts of personality, and that, as such, their value is, so to speak, in inverse ratio to their psychological intensity? They do far more than just to call forth a few transitory, superficial states of consciousness; they shape the nerve centers, give them tone, give them a habit. Consider for a moment the enormous power of these actions (feeble though they appear) going on unceasingly, untiringly, repeating forever the self-same theme with few variations. Why should they not result in forming organic states, that is (as implied in the definition of “organic”) stable and continuous states which shall represent, anatomically and physiologically, the inward life? Of course all this does not depend on the viscera alone, for

* Perrier, *Op. cit.*, pp. 448, 491, 501.

† Espinas, *Les Sociétés Animales*, p. 520.

the nerve centers too have their own proper constitution, in virtue of which they react. They are not merely receptive but incitative also, and they are not to be separated from the organs they represent, and with which they form one whole: between both there is reciprocity of action.

Where do all these nerve actions come together and meet? where do we find the *résumé* of the organic life? We know not. Ferrier thinks that the occipital lobes have a special relation to the sensibility of the viscera, constituting the anatomical substratum of their sensations. Taking this view simply as a working hypothesis, it follows that by successive stages, by one transfer after another, the visceral life has at last found here its ultimate representation; that it is writ here in a language unknown to us indeed but which expresses the inward individuality and that only, to the exclusion of all other individuality. But in truth whether this anatomic representation exists in the occipital lobes or elsewhere, and whether it be localized or diffused, does not affect our conclusion, provided only it exists. I have the less hesitation in dwelling on this subject, because this coördination of the multitudinous nervous actions of organic life is the groundwork of the physical and psychical personality, since all the other coördinations are based upon this; because this coördination is the inner man, the material form of his subjectivity, the ultimate reason of his feeling and action, the source of his instincts, sentiments and passions, and in the language of the mediæval schoolmen, his principle of individuation.

To pass now from the inward to the outward, the periphery of the body forms a surface over which the nerve terminals are unequally distributed. Whether few or many, the nerve filaments receive and transmit from the different parts of the body impressions (that is to say, molecular disturbances); are centralized in the spinal cord, and thence pass to the medulla oblongata and the pons Varolii. There a new contingent is added—that from the cranial nerves: and now the transmission of sensorial impressions is complete. We must not overlook the centrifugal nerves, which act in a similar way, but in the direction of an increasing decentralization. In short, the spinal cord, which is a string of superposed ganglia, and more particularly the medulla oblongata with its special centers

(of respiration, phonation, deglutition, etc.), while they are all organs of transmission, represent the reduction to unity of a vast multitude of nervous actions diffused throughout the organism.

At the point we have reached the question becomes full of obscurity. The mesencephalon seems to possess a more complex function than the medulla oblongata, and that a more complex function than the spinal cord. The corpora striata would seem to be the center in which are organized the habitual or automatic actions, and the optic thalami to be the point where the sense impressions are reflexed in movements.

However this may be, we know that the fasciculated portion of the *crus cerebri*, a bundle of white brain substance continuous with the peduncle, traverses the opto-striate bodies, penetrating into the strait between the optic thalami and the lenticular nucleus, and that it branches out in the hemisphere, forming the *corona radiata* of Reil. It is a pathway over which pass all the sensorial and motor fibers running to or from the opposite side of the body. The anterior portion contains only motor fibers. The posterior portion contains all the sensorial fibers, a certain number of motor fibers, and all the fibers coming from the sense organs. The bundle of sensorial fibers having received its full complement, divides into two: one portion ascends to the fronto-parietal convolution; the other is turned back to the occipital lobe, and the bundle of motor fibers is distributed through the gray cortex of the motor zones.

These details, tiresome as they will be to the reader despite their brevity, show the close interdependence of the different parts of the body and the cerebral hemispheres. Here the study of the localization of functions, though not yet carried very far, has settled a few points, as that there is a motor zone (formed of the ascending frontal and ascending parietal convolutions, the paracentral lobe, and the base of the frontal convolutions) in which are represented the movements of the different parts of the body; and that there is a sensitive zone far less clearly defined (embracing the occipital lobes and the temporo-parietal region). As for the frontal lobes, we have no definite knowledge with regard to them, but we may in passing notice the hypothesis recently offered by Dr. Hughlings Jackson that they represent, with respect to the other centers, combinations and coördi-

nations of a more complex kind, being thus a representation of representations.*

We cannot notice past and present discussions upon the physiological and psychological rôle of these centers: to do so would require a volume. But we may say that the cortical substance represents all the forms of nerve activity—visceral muscular, tactile, visual, auditory, olfactory, gustatory, motor, signifiatory. This representation is not direct. An impression does not go from the periphery of the brain as a telegram goes from one office to another near by. In one case, where the spinal cord was reduced to the size of a goosequill and the gray substance was extremely small, the subject possessed sensation.

But though indirect or even doubly indirect, this representation is, or may be, a total representation. Between the equivalents of these nervous actions distributed throughout the body there exist innumerable connections—commissures between the two hemispheres and between the several centers of each hemisphere—some of them innate, the others established by experience, having all possible degrees, from highly stable to highly instable. The physical personality, or in more precise language, its ultimate representation, thus appears to us not as a central point whence all radiates and where all converges—Descartes's pineal gland—but as a wonderfully complex net-work where histology, anatomy and physiology are baffled every moment.

From this very imperfect sketch the reader may see that the terms consensus, coördination, are not mere *fatus vocis*, abstractions, but that they truly express facts.

Let us reinstate now the psychic element hitherto eliminated, and note the result. It must be remembered that according to our view consciousness is not an entity, but a sum of states each of which is a specific phenomenon dependent on certain conditions of the brain's activity; that it is present when these are, is lacking when they are absent, disappears when they disappear. It follows that the sum of a man's states of consciousness is far inferior to the sum of his nerve-actions (that is, his reflex actions of every kind, from the simplest to the most composite). A period of five min-

utes may embrace a multitude of sensations, feelings, images, ideas, acts, and it is possible to determine the number of these with some degree of exactness. During the same lapse of time there will be a much larger number of nerve-actions. Hence the *conscious* personality cannot represent *all* that is going on in the nerve centers: it is only an abstract, an epitome of them. This follows necessarily from the nature of our mental constitution: our states of consciousness range themselves in time, not in space, and according to one dimension, not all dimensions. By a fusion and an integration of simple states are formed highly complex states, and these enter into the series as if they were simple: they may in some measure co-exist for a little time; but after all the compass (or extension) of consciousness [Umfang des Bewusstseins], and particularly the compass of clear consciousness, is always very limited. Hence we cannot regard the conscious personality, in its relation to the objective, cerebral personality, as a tracing which corresponds exactly with the drawing from which it is copied: it rather resembles a topographical sketch as related to the face of the country it represents.

Why do some nerve-actions (and which ones?) become conscious? To answer this question would be to solve the problem of the conditions of consciousness: but these, as we have said, are in great part unknown. There has also been much discussion as to the part played in the genesis of consciousness by the five layers of the cortical cells, but on this point we have nothing save pure hypotheses. These we need not consider here, for it cannot be of any advantage to psychology to rest its conclusions upon an insecure physiological foundation. We know that states of consciousness, always unstable, evoke and supplant one another. This is the result of a transmission of force, and of a conflict among forces; and, for us, it is not a conflict between states of consciousness, as commonly supposed, but between the nervous elements which underlie and produce them. These associations and these antagonisms, which have been the object of deep study in our day, do not however belong to the present inquiry: we must go further back and consider the conditions of their organic unity. For states of consciousness are no *ignes fatui*, now flaring, anon extinguished: there is something which unites them,

* *Lectures on the Evolution and Dissolution of the Nervous System*, 1884.

and which is the subjective expression of their objective coördination: in this we find the ultimate ground of their continuity. Though we have already studied this point, it is so important that I have no hesitation about returning to it and viewing it under another aspect.

Be it remarked that we are not speaking just now of self-conscious personality, but of that spontaneous, natural sense of our own being which exists in every normal individual. Every one of my states of consciousness possesses the twofold character of being such or such a state, and of being *mine*; pain is not simply pain, but *my* pain; seeing a tree is not simply seeing it but *my* seeing it. Each one has a mark whereby it is known to me as mine only, and without which it seems foreign to me, as in some morbid cases already referred to. This mark common to all my states of consciousness is a sign of their common origin, and whence can it come if not from the organism? Suppose we were able to obliterate in a man the five special senses and with them their entire psychological product, such as perceptions, images, ideas, associations of ideas with one another and of emotions with ideas. In that case there would still remain the inward, organic life with its proper sensibility to the state and functioning of each organ, to the general or local variations of the organs, and to the elevation or the depression of the vital tone. The state of a man who is sound asleep pretty fully realizes these conditions. If now we try the opposite hypothesis, we find it absurd, contradictory. We cannot imagine to ourselves the special senses, together with the psychic life which they sustain, isolated from the general sensibility and suspended *in vacuo*. None of our sense-apparatus is an abstraction: there is no such thing as a visual or an auditive apparatus in general, as they are described in physiological treatises, but only a concrete, individual apparatus, and never, save perhaps sometimes in twins, are these apparatus alike in two individuals. Nor is this all, for not only is the sense apparatus of each individual peculiarly constituted—a peculiarity directly and necessarily communicated to all its products—but it is at all times and in every respect dependent on the organic life—on the circulation, digestion, respiration, secretion and so forth. These several expressions of the individuality attach to every perception, emotion, idea, and become one with

them, like the harmonics with the fundamental tone in music. The personal and *possessive* character of our states of consciousness therefore is not, as some authors have held, the result of a more or less explicit judgment affirming them to be mine at the instant they arise. *The personal character is not superadded, but inherent*: it is an integral part of the fact, and results from its physiological conditions. We do not find out the origin of a state of consciousness by observing itself alone, for it cannot be at once effect and cause, subjective state and nerve-action.

The pathological facts confirm this conclusion. As we have seen, the consciousness of selfhood rises or falls according to the state of the organism, and hence some patients declare that their "sensations are changed"—the explanation being that in their case the fundamental tone has no longer the same harmonics. So too we have seen states of consciousness lose by degrees their personal character, becoming for the individual objective and extraneous. Can such facts be accounted for on any other theory?

John Stuart Mill, in an oft-quoted passage, asks what is the bond, what the "organic union" between one state of consciousness and another—the common and lasting element; and his conclusion is that we can affirm nothing definitively of mind but states of consciousness. That is doubtless so if we confine ourselves to pure ideology. But a group of effects is not a cause, and however minutely we study these, unless we go deeper our labor is incomplete—that is, unless we descend into that obscure region where, as Taine says, "innumerable currents are ever circulating quite beyond our consciousness." The organic *nexus* desiderated by Mill exists by definition, so to speak, in the organism.

The organism and the brain, its supreme representation, is the real personality, containing in itself the reminiscence of what we have been and the possibilities of what we shall be. On it is inscribed the entire individual character with all its aptitudes, active or passive, its sympathies and antipathies, its genius and talent or its stupidity, its virtues and its vices, its sloth or its activity. What comes forth in the consciousness is little compared with what lies hid though still active. The conscious personality is only a small part of the physical personality.

Hence the unity of the Me is not, as

taught by the spiritualists,* the unity of one entity manifested in multiple phenomena, but the coördination of a number of states that are continually arising, and its one basis is the vague sense of our own bodies—coenæsthesia. This unity does not proceed from above downward, but from beneath upward: it is not an initial but a terminal point.

Does such perfect unity exist? In the strict sense, clearly not. In the relative sense it is seen, but rarely and momentarily. In the skilled marksman as he takes aim, or in the surgeon as he is performing an operation, there is a convergence of all the faculties mental and physical. But observe the result: in such circumstances the sense of the real personality disappears, and thus we see that perfect unity of consciousness and the sense of the personality are mutually exclusive. And we may reach the same conclusion by another route. The Me is a coördination. It oscillates between two extreme points—perfect unity and absolute incoördination—else it ceases to be; and we find all the intermediate degrees exemplified without any line of

demarkation between normal and abnormal, health and disease, the one trenching upon the other.†

The unity of the Me then, in the psychological sense, is the cohesion, for a given time, of a certain number of clear states of consciousness, accompanied by others less clear and by a multitude of physiological states, which, though unaccompanied by consciousness, are not less effective than the conscious states, and even more effective. Unity means coördination. The gist of the whole matter is that the *consensus* of the consciousness, being subordinate to the *consensus* of the organism, the problem of the unity of the Me is, in the last resort, a biological problem, and it is for biology to explain, if it can, the genesis of organisms and the solidarity of their parts: the psychological explanation can come only then. This we endeavored to show in detail by analyzing and discussing morbid cases. Here then our task ends.

* Opposed to *Materialists*.

† Even in the normal state the coördination is often so lax that several series co-exist separately. One may walk about, or perform manual work with a vague, intermittent consciousness of his movements, at the same time singing and musing; but as he begins to think more intently, he stops singing.

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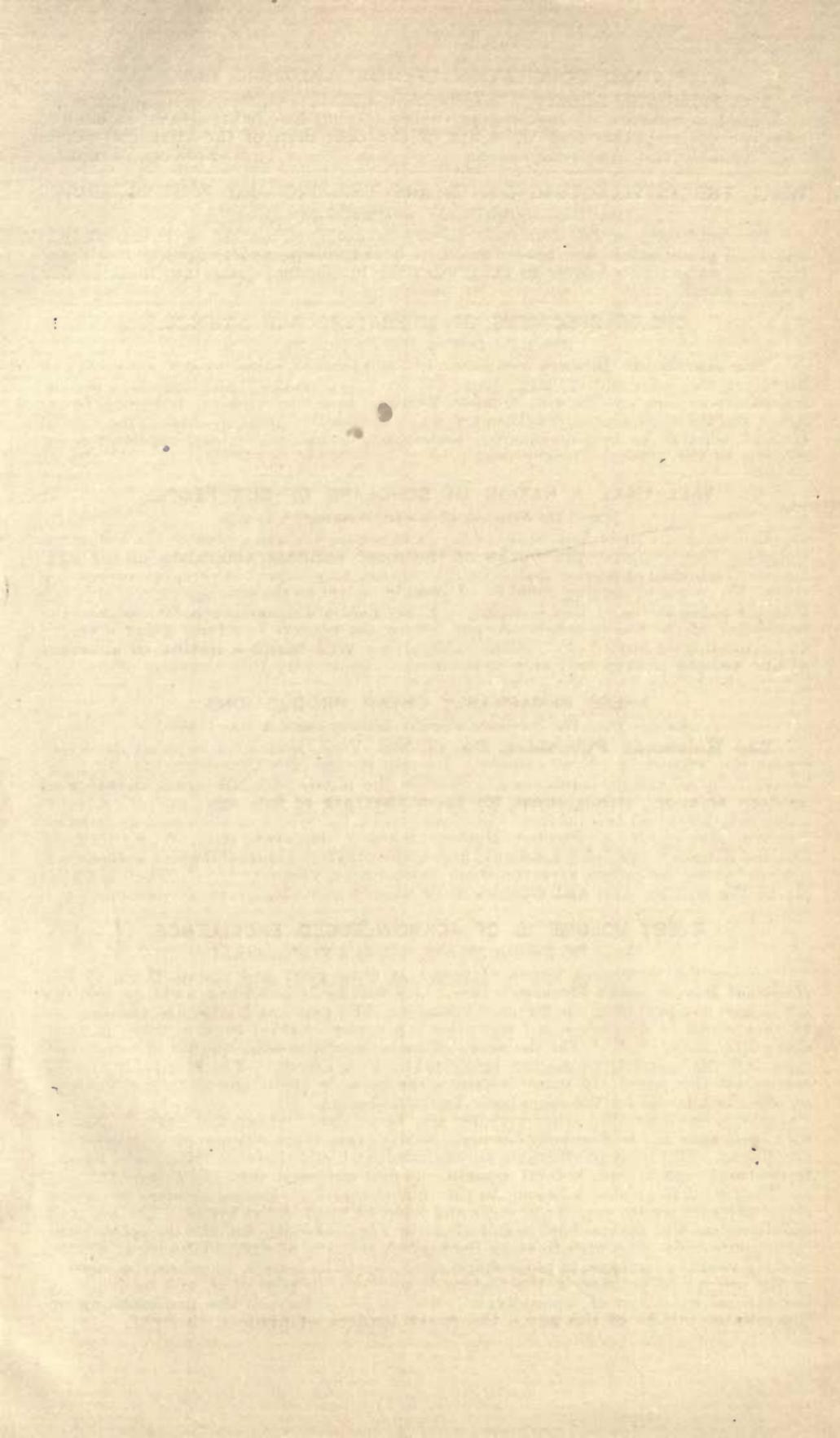
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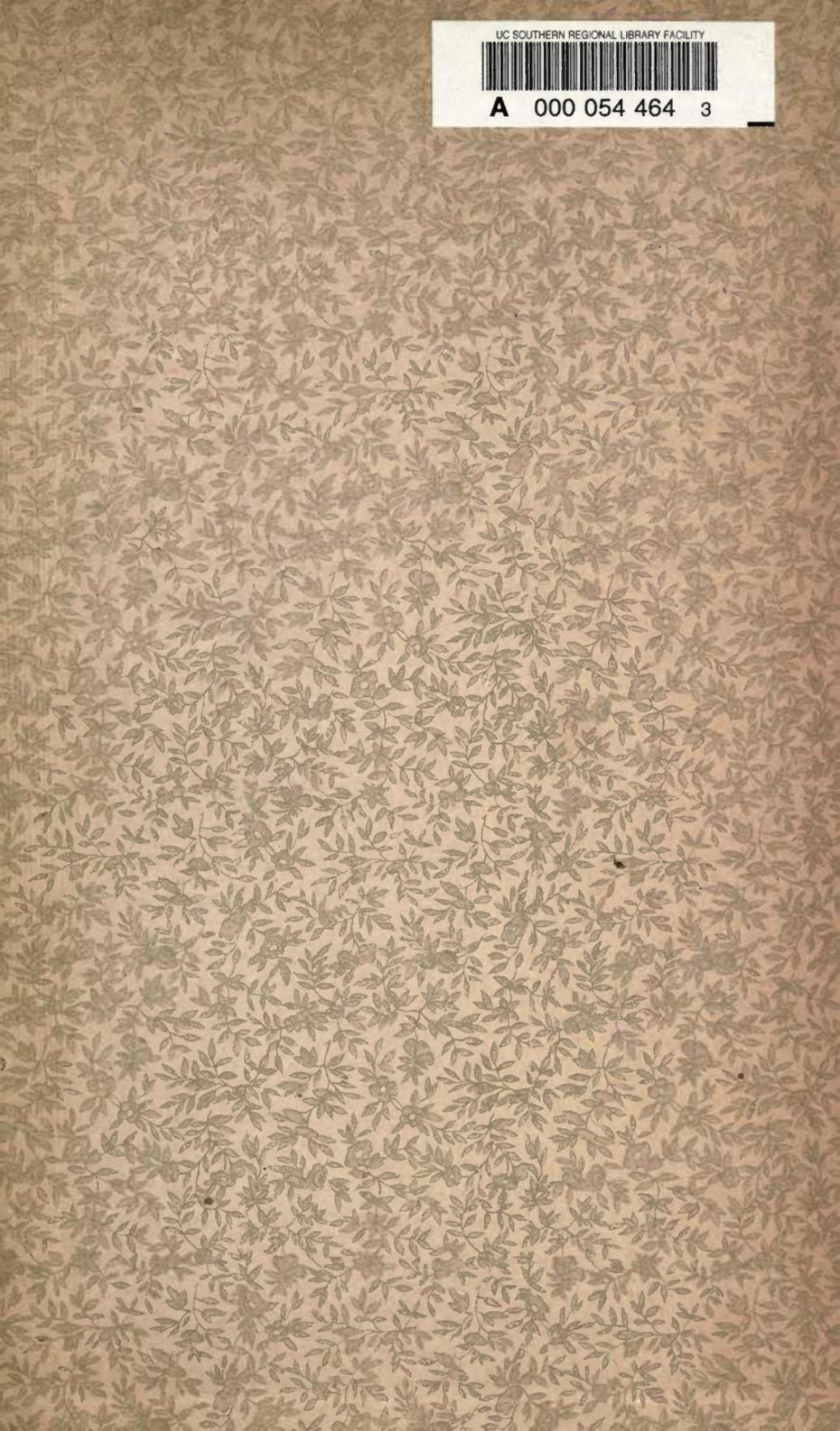
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