more than is necessary. Hence thought will naturally tend to be simplified and simple. *In thought, then, we have a simplified and lessened discharge.* We, therefore, reach again the conclusion that, in the memory, motor activity is present in a simplified form.

The re-development of all that is directly dependent on the body and independent of the body’s environment, as summary feelings and combination feelings or, again, our bodily actions, raises no difficulties, since the body is ever-present. Embarrassment, however, arises when visual and audile images are in question. Here the matter is generally in part of extra-bodily origin, and the problem needs special elucidation. There appear to be only two probable explanations. The light-dust and the sound-dust, as happens in dreams, may be elaborated into certain definite images; or else the primary effect leaves traces which allow of re-elaboration. The latter of these courses seems the more probable in the case of normal thought.

We are not justified in asserting that we hear in the ear, any more than in saying that the mouth is the stomach; that is to say, the sensory organs are not the senses, and sensations are hence the outcome of manifold transformations. When, therefore, a particular modification of the brain is centrally stimulated, we obtain the same result as in afferent stimulation, minus the full effect on the sensory termini.

There is one great difficulty in the theory of simplified and lessened discharges. As regards feelings of every kind, it is generally admitted that one class of feeling, such as sadness, excludes its opposite, joy. In this spirit we are told by Ferrier that “we cannot feign grief with a smiling countenance” (*The Functions of the Brain*, 1886, p. 461). As regards sight and hearing, however, it is a plausible surmise that sight sensations do not exclude sight images. Observation speaks with no uncertain tones on this subject. We may be engaged in continuous reading, and yet our thoughts may be roaming in distant visual regions. We may be visually regarding one object while deliberately awaking sight images. We may, for experimental purposes, pre-member and re-member sights at the same time, or at least we may feel convinced that we are doing so. I have on innumerable occasions tested the possibility of seeing one thing and imaging something else, and the evidence always favoured the double process theory. Against this latter notion one can only contend that the evidence is unsatisfactory. Visual sensations, as we know, persist for some little time after the stimulus has been withdrawn, and visual images only require a maximum of about three quarters of a second to be elaborated. Under these circumstances, probability demonstrates nothing. We may be looking on and off when we think that we are looking continuously. The only satisfactory course is rapidly to explore with the eyes one picture full of detail, while, at the same time re-developing, say, a long walk in equal detail and continuously. Even then we should have to be careful that pre-membering and re-membering do not occupy between them the one simultaneous total field of sight. However, experiment alone should settle this matter.
An additional argument in favour of our position is that the primary and secondary field of observation are alike in extent, and that granting slight variations, we cannot in imagination see or hear more than in reality. [Test this.] The range of sight or hearing is the same in sensing and in imaging; in fact, the latter is as a repetition of the former. In secondary speech I note the same pauses and changes in tone as in ordinary speech, though sounds are more frequently slurred. [Examine.] In secondary sight I observe the same method as in ordinary sight of turning at a certain time rate from picture to picture, and from one part of a picture to another part, while the images are developed in the positions in which they were originally observed. Often, indeed, the memory time rate is slower than the observation time rate.

To summarise this long section. The matter of memory and reality is one, “primary” and “secondary” being terms which refer to modes and arrangement of combinations and not to the material of those combinations. Nevertheless the two realms are not strictly co-extensive, for sight, sound and feeling alone appear in re-development, and then generally in a vaguer and simplified form. The reason for the exceptions just referred to we have traced to the differences in the apparatus of sense, the more frequent employment of these apparatus and their greater independence and more conspicuous usefulness. We have also seen it to be probable that sensations and images which occupy the same position as to space always exclude each other, since the primary and secondary field are one. [Question this.]

A few remarks as to the third dimension imaged will be found in sec. 169, while some reference to motion as sensed is made in sec. 174. Here I shall treat of two matters, the first one being the nature of imaged motion.

12ca.—Motion as Imaged.

I have made frequent allusions to the universally admitted fact that we ordinarily image motion by re-developing momentary impressions as does a photograph. I never doubted that one could readily image objects in motion if one so desired. However, on attempting to do so, I found myself face to face with a new set of problems. The final results of the investigation are contained in what follows. I can, for instance, without difficulty obtain a continuous imaged view of the objects in any room I well know, a view nearly equal in character to the one procured by ordinary movements of the eyes, head and body. By looking at the pavement for some yards ahead of me, I can, on shutting my eyes, image the visual changes for that distance while I am walking. Looking at well known shops under similar circumstances, I can apparently pass by them and observe the changes which ordinarily result from such movements, and this I can do with a few, perfection when on the top of a moving tram-car along a well known route, I can, therefore, what is continuous and well known, and I can image it as passing along. But if what is continuous is not well known, then I can obtain merely a series of pictures. I cannot image a carriage or a person as moving along; for if I try to do so, I see a carriage or a person in a certain fixed attitude. Nor can I ordinarily image anybody or anything moving or acting in an environment that does not move with them. The reason for this inability seems to be that in imaging that which moves continuously, as the view of shops, we image no environment in addition; while in imaging a carriage moving along a road, we can only do so, if we image the carriage and the houses which the carriage passes by. Hence unless we do, or can, re-develop in progressive order the enormous quantity of
qualitatively distinguished sights which we observe on such occasions, we shall see a
stationary carriage. In actual observation this happens when the lights of a train are
seen from a distance at night time, for then we have no decisive means of telling whether
the train is stationary or not. Now as only the essential portion of what we see is normally
re-developed, i.e., that which falls within the focus of interest and observation, and not
the vast mass of what surrounds it, it follows that images must ordinarily appear as fixed.
In my case this is so, and though I have experimented at some length in the matter, I can
see no escape from the above conclusions. For this reason, I am quite unable even im-
mediately after close observation, to image a thing as acting or moving; nor can I image
my own leg or foot movements while walking. [Walk in imagination, counting step, and
compare; thus you follow second-hand of watch.] Fall ing within my own observation, I only know
of two classes of exceptions to the above rule. In dreams, as we shall see, we make up
our setting, and hence the required conditions for imaged movements exist. In the
waking state, on the other hand, I image, or seem to image, movement when under
considerable excitement. Thus when I vividly imagine a physical struggle or a sensitonal
scene, the event seems to take place before my image eyes. In all such instances, how-
ever, not only is the emotional aspect realistically developed; but the movements are
plainly acted by me, while the setting is probably constructed as in dreams. [Think of
bicycle, tram, train and cart in motion; measure and count in imagination objects you know,
and then verify.] We may, therefore, sum up by saying that imaged visual motion, depends
on completeness of re-development, and that in proportion to the absence of such
completeness, we are less and less able to image motion. Only this should be added that
there is good reason to think that most persons have too imperfect a memory to image
things moving in a stationary environment. This is, however, a matter for careful
scrutiny, as I find that with shut eyes I can follow extremely well known movements such
as the slow doubling of the arm. [Test the whole paragraph step by step.]

Further examination of the problem of imaged motion suggests another obstacle to the
images rivalling the sensations. If we see a greyhound running a course, some sixty
seconds may pass before the course comes to an end. If we are close by, we notice con-
tinuously the chief features in every one of his movements. In correct memory, then, it
should take sixty seconds for the imaged dog to finish his course, while his movements
should be observable step by step. For my part I find that in the sense of time is
entirely wanting as regards visual imagery, and that, therefore, I cannot image motion
generally, since without the time sense all correct imaged motion is impossible. This
difficulty appears to be a fundamental one, and seems to hold of all persons. The matter,
however, must be probed by many before an emphatic pronouncement can be made.
[Experiment.]

Stricker (Bewegungsvorstellungen, 1882) mentions in the preface to his excellent little
book that he finds it difficult to image motion. He holds that motor ideas are due to
feelings in the muscles, and not to either sight or touch (p. 3); that in thinking of oneself
as moving, muscle feelings are essential (pp. 12-3); and that the same holds of re-develop-
ment as a whole (p. 18). From this he concludes generally that since all action, primary
or secondary, is connected with muscle feelings, therefore men have, by invariable
association, an irresistible tendency to explain motion of every kind by reference to a force
which is supposed to propel things.

120b.—THINKING IN WORDS.

Having dealt with the nature of imaged motion, we may enter upon our second inquiry,
the nature of word images or thinking in words. Stricker (Sprachvorstellungen, 1880)
reasons along some such line as the following: With the re-development of letters
or words are connected certain feelings in the muscles of articulation. These feelings have
their source in impulses coming from the neural speech centre, and pass through the
motor nerves to the muscles, while these impulses again enter consciousness, and we localise
them in the muscles (p. 100). Stricker argues in detail that all persons have those muscle
feelings when thinking in words, and he also reasons that only exceptional persons hear
there voice in thinking. We think, so to speak, in muscle feelings. Accordingly he reasons that we re develop letters, and not words (p. 85); that neither two like letters, nor two like words, can be developed at one and the same time (p. 86); and that when we read one thing and recite another, it really is as if two persons used one typewriter simultaneously (p. 90). Ballet (La Langage Intérieur, 1866) almost dismisses Stricker's point of view with the barren and unsupported statement that the Austrian professor is a monstrosity. It will, however, require a great deal of scholarship to affect Stricker's main positions: Dodge (Wortvorderstellungen, 1896) usefully suggests that Stricker's innervations are more probably touch feelings (p. 27); he also points out that, as in eating, the lips are frequently moved without our thinking of letters (p. 34); and he inclines to the view that what distinguishes speech from other motor elements is "a kind of unlocalized, pale, acoustic image" (p. 35). I feel diffident in taking sides. The one thing that seems clear to me is that my word thought is aural in the ordinary sense of that word. I hear what I think, and these sounds have the qualities of the sounds which they reflect. I often observe the muscle feelings referred to by Stricker; but by no means always. When I am thinking while I am reading, or when I am absorbed, I consider it almost certain that no muscle feelings exist and that the thought is entirely aural. So, too, I still believe that two sets of words, repetitions of each other, may be recited simultaneously, one set being heard and the other spoken. However, the whole problem of speech images awaits yet fuller study by men of Stricker's scholarly character.

121.—The Growth of the Memory.

All development is need-determined, and primary and secondary activity, as we learnt in the last section, are indistinguishable from one another in all but circumstantial. In the growth of the memory, therefore, we merely trace the stages of development as far as repetition (or continuous activity) enters into the problem.

In the abstract it might be imagined that repetition makes no difference or a great difference to any function. For example, fabulous quantities of water may flow through an iron pipe without much affecting it, while, on the contrary, a breath will cause an elaborate house of cards to tumble to pieces. Going to our data, as supplied by our knowledge of the human organism, we find that repetition is need-determined and has only appreciable advantages when it spells vigorous activity. In the latter case, a system is developed with greater ease at second time, and from this it follows that much vigorous repetition along many lines alone makes complex processes, such as are involved in thought and action, possible. Consequently in the adult, combinations (acts or thoughts) will readily develop.

The manifold functions of the body at birth are already part of the great fact we are dealing with; and in so far as exercise assisted in their formation, we might call these functions prenatal memories. However, as far as extensive re-collection is concerned, the new-born infant is very far below the adult. We, therefore, begin our examination with the child after birth.

The lowest kind of memory which is at first prominent, may be called exercise memory. For the first few months of its post-natal life, the child's muscular system is busy exercised. Fingers, hands, wrists, arms, toes, feet, legs; the head and the trunk; the voice; are exercised so as to develop to the utmost the muscular system. The consequence of this is that the adult can scarcely effect a movement which is new to him, and
hence his marvellous quickness and readiness to move portions of his organism or to work out problems (sec. 19).

The next form we may call 

**detention memory or recognition**  
In the exercise memory this recognition is also implied in the sustaining of a particular class of movement. Still, detention occurs more especially or more strikingly in the first stages of seeing, hearing, etc. Any relatively familiar sight, for instance, detains the eyes in proportion to the quantity of repetitions. Thus the child grows to recognise its hands, its mother, its most faithful companions, and its special surroundings so far as they interest it. And, again, response to sounds becomes more and more effective with repetition. Exercise memory has large scope in the adult, and is evidently the most primitive kind of memory. When we come to detention memory a higher stage is reached: it is the stage of primitive wonder, and wonder, we know, is the beginning of wisdom. As is well known, it is easier to recognise a thing than it is to develop it in its absence.

Advancing, we come to action memory. By a series of need-determined feats, the infant begins to indulge in combined movements, such as using both hands together or locking its own busy hands, or interrupting a sound as issuing from the person looked at. It is owing to this absence of combined activity, that the infant readily responds to touch, and that it attempts only later to co-ordinate sense impressions. In these primitive instances we have combined exercise and combined recognition rather than action. It is only when the child conveys things to its mouth or rubs its eyes when sleepy, or when, again, the eyes begin actively exploring, that we have action. One of such small beginnings more and more complicated actions develop until we marvel at the wonderful dexterity of the adult. Given simple actions such as those enumerated, and it is easy to see how the most complicated actions follow. Exercise of parts ends in combined functional exercise until it is difficult to think of any adult's action which does not largely consist of memories.

Increasing in complexity, we meet with recency memory. Here some little time elapses between one act and its repetition, several acts of a different kind being perhaps interposed. For instance, an infant not quite five months old, touches a dinner plate which is somewhat removed from it, and after a while repeats the action several times. Or else it readily looks in a direction in which it has been recently looking. From such germs develop the complex states which we have discussed under the heading of Recency (sec. 110). What we do, allowing for needs, not only tends to be repeated at once, but also after a short interval. Here we have made another advance. In the three previous kinds of memories repetition was immediate; in this kind of memory it is mediate. It proves that a brain area remains sensitive for a certain period. Accordingly as the infant grows, it not only tends to repeat a movement or a word incessantly; but it tends to repeat them repeatedly soon after the repetition; and in this way the memory is stocked. Hence a combination tends to be retained or resist
dis-memberment, and combinations, therefore, take firm root and are readily re-developed.

In free memory or ordinary memory, we have only the above mentioned factors combined and developed. On being presented with something the child has learnt to say unintelligently "tah." Later on it will volunteer intelligently "Thank you." Granted such recurrence, and the most complex speech, made up as it is of re-developed words and familiar turns, is readily explained. As we saw in ch. 4, excitement and development, under the pressure of needs, explain the thoughts and actions of an adult, and such excitement and development already exist in the infant. With the re-development of $A$, $B$ is made possible, with that $C$, and so on. Given, then, the existence of a need seeking satisfaction, and the re-development of $A$ will be followed by $B$, and that by $C$. The chief change which takes place in the period between infant life and adult life is the storing of the memory and the simplification of acts when they do not need to be bold and explicit, e.g., in thought. The adult's memory is, then, the child's repeated activity expanded and yet simplified. Instead of thinking loud and gesticulating, the adult thinks largely in summary feelings and combination feelings.

Several authors distinguish between re-developing and knowing. Thus we say that we re-member seeing an intimate friend yesterday; but that we know, believe or doubt, that we have seen him previously. To know something is to "connect" it with something else. Herbert Spencer says: "To ask a man whether he remembers that the sun shines, that fire burns, that iron is hard, would be a misuse of language" (Psychology, 1890, p. 450). Again: "A remembrance implies a consciousness, and a consciousness implies a perceptible duration" (ibid., p. 447). See also: Allen, The Recognition Theory of Perception, 1896; Allen, Recognition, 1896; Bergson, Mém. et Reconnaissance, 1896; Bourdon, La Reconnaissance, 1895; Dearborn, Recognition under Objective Reversal, 1899; Höffding, Zur Theor. des Wiedererkennens, 1892; Lehmann, Uber Wiedererkennen, 1888; Lehmann, Studien uber das Wiedererkennen, 1891; Malapert, La Perception de la Ressemblance, 1898; Ward, Psychology, 1886, p. 63; and Washburn, The Process of Recognition, 1897.

112.—The Elements of Memory.

A few sections back it was pointed out that as the individual matures, so his newly acquired knowledge is new only in a relative sense, and that it is because of this that he observes and memorises quickly. An important truth follows as a consequence. In chs. 2 and 4 we assert perceptions and ideas are not stored. We have seen since how would be to stow away these complex systems, of which but a met portion is ever re-developed, and it was also suggested in those chapters that sense systems do not differ in kind. That is, just as one who type-writer employs the same steel letters over and over again in a book, so we imagine that combinations are produced mentally simple processes. The number of elements is perhaps 1,000, and the elaboration of these into particular wholes, memory, etc. In fresh reactions, therefore, only the new, would create obstacles to assimilation, while every sensation or image
is, on this hypothesis, a brand-new synthetised set of elements. Hence in
the life of adults totally new occurrences are rare, and re-development is
rapid on account of this. We, therefore, easily re-develop what is old,
though much attention must be devoted to learning what is new, and this
explains the tendency of traces to be wiped out. It also makes it clear
that we are not bound to assume the re-development of countless events,
and that there is no justification for the assertion that a system has not
been re-developed for a long time. The same components, more or less
compounded, form part of hosts of reactions. What remains to be explained
is the method of the composition of the parts; but this must be left to the
physiologist.

123.—What constitutes a Perfect Memory?

Secondary, like primary, systems have a part to play in the satisfaction
of needs, and hence the limitations of secondary systems are of importance.
The results arrived at in the last section but one, assist us here; for the
best memory is the highest memory spoken of there. A good memory will
readily retain much for a long time, and the image will faithfully and com-
pletely represent the sensation, being neither distorted, nor simplified, nor in
any way changed. These desirable characteristics are by no means univer-
sally observable. Some persons find it difficult to learn anything by heart:
they can retain but little, and that for a short time only. The image, too,
in many cases neither faithfully nor completely represents the sensation,
being distorted, simplified and changed in various ways. Retention repre-
sents, however, but one aspect of memory. It is not enough to retain; one
must be able to re-develop at will what has been retained. That is to say,
assuming adequate retentiveness, there remains the need of adequate re-
development. In a perfect memory any fact needed develops at once and with-
out effort. In ordinary re-collection, on the contrary, several factors have
to be considered. We may be compelled to employ measurable effort; we
may require to go through a good deal of haphazard re-development before
the needed system develops; we may have to fly to some closely related
fact before being successful; and we may be unable to re-instate a system,
though we recognise the relevant detail we are in search of when we
stumble upon it. A perfect memory, then, retains well and re-develops
readily what is relevant. My own memory well illustrates the defects of
memory. One Spring time I had examined large numbers of the wood
anemone, seeing multitudes of specimens day by day. The following
Spring I went into the country and saw by a brook what seemed an un-
known flower. This stranger proved to be the wood anemone. The
memory had completely faded, retention having been at its minimum.
With respect to the absence of a serviceable memory I may refer to the
following incident. I thought that a want of retentiveness might be over-
come by repeated committal to memory. I consequently read three times
consecutively a certain work in which I was specially interested. The
result was that while, as I read, very much was regarded as familiar and
known, yet hardly anything could be freely re-developed. In a perfect
memory, on the contrary, a single reading would have sufficed to ensure
both adequate retention and relevant re-development. [Test collectively as
regards goodness of memory.]

124.—PRIMARY AND SECONDARY SERIES DISTINGUISHED.

Certain cases suggest a solution of the problem of finally distinguishing
between memory and reality or secondary and primary combinations. For
instance, I have several times thought of a face without being able to deter-
mine whether I had seen that face in a picture or in life, or whether it was
the work of the imagination. In such cases I have for days most minutely
examined my state until the face was localised in some series. [Repeat this.]
Localisation, and that alone, seemed to settle the order of facts to which
the face belonged. *If I connect my vision with a certain house I frequent,
I speak of the face as being re-developed and real; if I re-integrate a
picture to which it belongs, I recognise that it is a copy of a copy; and so
on. We are, therefore, right in speaking of a world order in which all
happenings find their allotted position. Memory, imagination, dream life
and reality would thus be determined by the place which any fact occupies,
and by that alone. If found at one point of the world web, we should speak
of co-existence; if at another point, of succession. Everything would
depend on the company in which the data were met. For this reason,
as we have seen above, an unlocalised fact cannot be said to belong to one
group rather than to another. For instance, suppose I remember a beautiful
place. I find no room for it in the connected series of visual impressions
which are streaming into my open eyes, and I exclude it, therefore, from
that order. I cannot, at the same time, re-integrate a picture, a fancy or an
event into which it logically fits. I can, however, trace the palace to
a set of happenings between yesterday and today, and I fix its position
accordingly, and speak of it as a dream image. It is in this manner that
we generally proceed. *We declare a thing to be real or objective, omitting
indirect thought, because it forms the fringe of the total world order. For the
same reason we speak of something as long past, because of its position in
the series. Time and space, then, are words which indicate the relation in
which facts stand to one another. (Secs. 182-3.) In the widest sense,
therefore, we are entitled to regard reality, memory, imagination, dream
life, time and space, as constituents in a world order, the relative position
determining in each case the sub-order to which a particular combination
belongs. In other words, we classify a fact according to its setting.*

* This is Ward’s view, Psychology, 1886, p. 63; also Ribot’s, Mémoire, 1881, pp. 32-46;
and Vascül’s, Localization, 1895. In a qualified manner Wi. L. Psychologie, 1893, ii,
p. 461) agrees that localisation in a series is one of the two signs of the past, the other and
more important factor being, according to him, the diminished intensity of the image.
125.—After-Images,* etc.

The student who has good eyesight,† and only he, should verify for himself some of the undermentioned facts and determine them in greater detail. He should vary the conditions as to colour, time, distance, size, shape and celerity. Quick, exact and exhaustive examination, together with an attitude to change the method of attack, are to be practised by the learner as well as by the teacher. Traditional science is no science at all

(1) Positive and Negative After-Images.—I look for a moment at the incandescent electric light before me. Then shutting my eyes, I can, without any effort, distinctly see the outlines of the glowing wires in a slightly fainter colouring. Keeping my eyes closed, the imaged wires, after some seconds, fade and disappear without changing colour; but opening my eyes onto a white sheet of paper I see the image again, but greyish in colour like damp white paper. As I try to fix it, the image moves upward, apparently because my eyes do so. If, however, I open and close the eyelids rapidly, with the gaze on the white sheet, I can see the fully coloured after-image on the paper. On blue paper I achieve the same result. As I move my eyes, so the image moves. Looking at the light and then directly at the sheet, I first see nothing; but slowly the image develops. Quick movements of the eyelids maintain and bring back the image for some little while.‡

Soon after rising in the morning—the eyes are then well-rested—I glance inadvertently at the dark green Venetian blinds, and discover a moment afterwards the positive after-image of those blinds on the wall to which my attention is casually directed. Repeating the observation deliberately, I note the following. I take a hurried glance at the blinds, shut my eyes and study the image. So faithful is it that I can count the number of laths in the blind, observe peculiarities connected with them, and read off points from the trees outside the window—a series of seats which I can perform with no ordinary image. If I open and shut my eyes rapidly and repeatedly, it becomes well nigh impossible to distinguish between the object and the after-image. Still, the brightness with me (is it so with you?) is not so pronounced in the image as in the sensation, and the detail also is limited. [Is it so with you?]

* The word After-image is far from being a happy one. After-sensation would be more correct, except that this suggests a close correspondence between the sensation and the image which does not exist. Perhaps after-image would be least objectionable as a name for something which, in its pronounced forms, has no apparent purpose to serve in the world's economy.

† Helmholtz (Handbuch, 1886-96) says that experiments, if prolonged, are dangerous to eyesight, and I can testify to this. Observations should be spread over a considerable period, and should cease at the first sign of ill-effects (ibid., p. 502).

‡ Positive after-images are those in which the bright portions of the object are bright, and the dark portions dark; whereas negative after-images are those in which the bright portions of the object appear darker, and the dark portions brighter (Helmholtz, Handbuch, 1886-96, p. 503). An exposure of 16-23 seconds is sufficient to obtain the former, and that of several seconds to produce the latter. To ensure the success of an experiment, the eyes should have been kept shut before starting and protected from the light for a few minutes (ibid., pp. 503-6).
One fine day, about 3 p.m., I was engaged in writing. As the paper showed faint patches which I usually connect with after images, I began to open and shut my eyes repeatedly with my glance fixed on the patches. Then, almost without warning, I saw on the paper the field outside the window, the trees close by, and the sky: everything in such complete detail as to form and colour that the sight unnerved me for the moment. This was unfortunate, as my observations were thus cut short. Such cases certainly suggest that observation and re-collection are theoretically photographic.

(2) *The Complementary Image.*—Gazing at a piece of blue paper, placed on a sheet of white, and then looking at another portion of the sheet, I see the image of the blue piece in yellow. Again, sitting with a red table-cloth in front of me and a lamp with a green shade on it, my eyes, on accidentally travelling to the ceiling, are confronted with the image of a green table-cloth and a red lamp shade. I notice here as in (1) that details are observable in the image which were not in the first instance definitely developed, i.e., which fell outside the focus of normal observation. The student will, of course, experiment with various colours, and record the results with the object of ascertaining the general facts. Hypotheses should not be indulged in, nor should the memory be trusted. Experimental examination, always supported by careful and exhaustive notes made at the time, should yield the compressed statements or general facts which are the goal of science.

(3) **Monocular and Binocular Vision.**—Looking with one eye at a picture where the relief is well imitated, we are surprised to find the picture unmistakably displaying the third dimension of space, depth. [Test this statement.] This is especially remarkable when we observe monocularly a coloured lime light picture here the sense of reality is irresistible. As we shall see in sec. 182, vision, whether monocular or binocular, gains its principal item of depth from the lines and surfaces seen by the eye. This general truth may be illustrated as follows. I look along the edge of a sheet of note paper. [Repeat this.] With the right eye open, I see more of the right side of the paper than it, the head remaining passive, I looked at that side with the left eye, and so with the left side, and the alternate use of the eyes. Hence either of the eyes necessarily sees less, in this case than both eyes together used alternately, and it will, therefore, repeatedly happen in monocular vision that, owing to certain lines being invisible, depth will disappear. In many instances, however, the exposed surface does not alter with binocular or alternate monocular vision, nor, then, as the case may be, depth will be equally seen or not seen, as in looking at the furniture of a room. Fundamentally, then, the principles of binocular and monocular vision are alike, the exposed surface gets the interpretation. It is in this way that the realism is introduced; the lime light scene, i.e., the single eye accentuates the lines which bring relief

Binocular vision: still using the sheet of paper for illustration.

*“For the purpose of observing this, place coloured papers on a grey has your eyes a definite point of the coloured paper, and then suddenly draw it away, not moving your eyes (ibid, p. 516)*
yield the two images given by the alternate use of the two eyes. Striking
a compromise, it gives a dimmed view of either side, slightly blurring what the
neighbour eye cannot apprehend, and toning down the picture common to
both eyes, thus yielding in a single picture, more than either eye and less
than both employed alternately. Neglecting for the moment the disad-
antage, the advantage of binocular vision is obvious. With both eyes open,
since the eyes are some distance apart, both side surfaces of the paper are
partially seen, thus giving depth to both sides, whereas in monocular vision,
one side only being seen, depth is abolished on one side. Consequently,
while there are complications when the closing of an eye is necessary for
the observation of depth, yet, generally speaking, monocular vision will be
far inferior to binocular vision. In practice, indeed, there are innumerable
occasions when an object is unknowingly within view of one eye alone as
when, in writing, the right eye sees the right arm and the left eye the left
arm. So also in looking out of the corner of a window where part of what
is observable is seen only by one eye, there seems no appreciable difference
traceable when I see the people pass from the binocular field into the
monocular one—not even when I deliberately experiment.

The stereoscope, invented by Wheatstone shortly before photography
became a fact, admirably illustrates our problem (Wheatstone, Physiology
of Vision, 1838 and 1852). Our two eyes are, strictly speaking, two cameras
placed at a certain distance from one another, and each camera, therefore,
yields a partly different picture. If photographs, then, are to represent
binocular vision with its two slightly different fields, they must be taken
from two points of view; that is to say, there must be two photographic
cameras employed at a distance similar to that between the eyes (or one
camera taking an object from those two positions). In this case we shall
have one photograph equal to the right eye view and one equal to the left
eye view. The stereoscope, by making it easy to see the two pictures as
one, thus supplies us with a single scene equal to one traced by two simulta-
neously acting eyes, and its results are superior as regards depth in pro-
portion to the greater distance between the cameras or positions. Since, then,
normal sight deals with a double picture, no painting or drawing, however
faithful, can exactly equal reality as seen with both eyes. For example, if I
hold a pencil perpendicularly a few inches in front of my eyes and look first
with one eye, and then with the other, at a picture in front of me, the
circle occupies different positions in relation to the picture; or if I look
through ordinary iron railings at a moving light out of reach with both eyes,
the light never disappears, while looking with one eye only the light, owing
to the intervening railings, constantly disappears and re-appears. [Text.]
SYSTEMS AS RE-DEVELOPED

up of two circles seen and blended by the two separate eyes. It is curious to observe how very far the process of blending, which lies at the basis of binocular vision, proceeds. For example, looking through a stereoscope at two real watches, one with and the other without "second" face, I find that now the figure VI is seen, and again the "second" face. Thus very irregularly drawn simple squares, etc., appear as regular, the irregularities being drawn out of the field of sight. Again, two photographs of an object, taken seven inches apart, are, I find, still seen as one stereoscopically. Hence it will be seen that the two slightly different pictures given by the two eyes readily blend into one.

[Repeat the above with variations.]

I met (Du Rassennement, 1888) holds that observing a colour, say, with the right eye (which is afterwards closed), the after-image is seen by the left eye (which is then open). In this he confirms other observers, though it has been shown since that Binet was probably miscalculated. [Test.] Titchener (Ueber binoculare Wirkungen monocularer Art, 1890) fully deals with the problem. The question of the monocular field of vision is discussed in Helmholtz's Handbuch, on pp 669-741, and the nature of the binocular field, on pp. 841-915.

Helmholtz enters exhaustively into the issues raised in this section. The following may also be consulted. Le Conte, Sight, 1881. Berry, in Brain, 1884; Franklin, J. of Psychol. of the After-Image, 1894; and Pimlott, The After-Image Threshold, 1895, and After-Images, 1899. For a class test, see Spencer, Psychology, 1890, i, p. 122. See also Ebbinghaus, Nachbilder, 1890; Rollett, Subjective Farben, 1891; Hess, Nachbilder, 1891; Washburn, The White Light After In, 1900; and Gillette, Notes on After-In, 1899.

126.—INTUITIONS.

What we remarked of the visual field in sec. 118, holds of re-development in general, for all re-membered, as all pre-membered, events fall short of possible completeness. This leads us to consider a series of curious instances.

One day, looking at a robin, it suddenly occurred to me that his appearance suggested a hunchback. This feeling, if it was a feeling, had been long with me without being recognized or connected. There was something unclassified—not even imaged as unclassified—some sort of uneasiness besetting me, before the doubtful twilight—scarce distinguishable from the darkness of the night—gave way to a flood of light. I am not sure whether there was present on each occasion anything which could be classified as visual, audible, motile, emotile or mental. Probably a visual as well as a motor factor existed. But, as I write, the visual element is so faint that I am not convinced of its actuality. I also trace a slight tendency to lift the shoulders,* if it be not rather a summary feeling connected with observing hunchbacks. It appears that extremely dim images, or apologies for images, are often with us without being distinctly recognized as such.

[Find similar traces in yourself.] They are comparable to the effects of a breath of wind on the waters where the ripples are so minute that we are not sure of observing them.

* Galton (Inquiries, 1883) refers to these dramatizing exhibitions.

Again, I am on a visit in the country. I meet a man who challenges my attention, and whom I often see and think about. I consider him interesting; I like his face. Returning to town, I accidentally encounter an acquaintance. Instantly I detect a resemblance between the
two. The mystery is solved, i.e., familiar chords were secretly touched. Mine was an erroneous interpretation. The likeness attracted me, and I made unfounded surmises. Familiarity was translated into attention, interest and admiration. In this case more than in that of the robin, I am convinced that a tolerably clear image haunted me.

Two important lessons may be learnt in this connection. First, familiarity is often misinterpreted as being some other fact, whence arise serious likes and dislikes which sometimes bear momentously on life and character. We are liable, through this source of error, to blunder on many occasions. The ogre becomes a saint; the saint an ogre. He who is uninteresting becomes admirable; he who is admirable, indifferent. A lofty notion is laughed to scorn; a mean one is lauded to the skies. Once the origin of the delusion is pointed out, there is a probability that we shall, to some extent at least, protect ourselves against its unsettling influence by the closer scrutiny of primary and secondary combinations.

Secondly, men often say that they "intuitively" judge of things, notions and characters. They glance, for instance, at somebody, and they fancy they can read his thoughts. The subtler class of memory we are discussing explains these pretensions. We see the face of a particular individual whom, for certain definite reasons, we dislike; we meet another of similar appearance, and we dislike him, too. Connected or conscious re-development being absent, we attribute to an occult power what is explicable on a rational assumption. If the judgment, in this connection, is acute, the consequences will, of course, be far-reaching; for we quietly judge from class to class, a similar feeling is aroused—usually without its corresponding image or with a dim image—and we pronounce accordingly. It does not require stating that the vast field of so-called intuitive or immediate judgments falls under this portion of our explanation. [Observe such cases.]

Only yesterday a dish struck me as very palatable, and I consumed it with considerable pleasure. It never occurred to me till afterwards that unnoticed familiarity lay at the base of the particular delight. In this fashion, snatches of a melody haunt us, and yet elude us. There is something present; but we cannot tell what. It is perhaps the swing of a tune, or a peculiar feeling connected with it or the image of the instrument on which it was played. Perhaps that something has no relation to the melody at all. [Carefully analyse this class of instances.]

"Truths, which we well know to be results of complicated and highly mediated trains of thought, present themselves immediately and without effort to the mind of any man who is familiar with the subject. The mathematician, like every one who has mastered a particular science, meets any problem with ready-made solutions which presuppose most complicated analyses; and every educated man has a number of general views and maxims which he can muster without trouble, but which can only have sprung from frequent reflection and long experience. The facility with which we attain in any sort of knowledge, art, or technical expertness, consists in having the particular knowledge or kind of action present to our mind in any case that occurs; even we may say, immediately in our very limbs, in an ongoing activity. In all these instances, immediacy of knowledge is so far from excluding mediation, that these things are linked together, immediate knowledge being actually the product and result of mediated knowledge." (Hegel, Logic, trs., 1892, pp. 129-30).
The whole question of obscure secondary units requires to be carefully elaborated.

The presence of imperfectly identified systems often explains what would otherwise appear anomalous. Speaking of American generals, one of a company referred to an American general of high standing whose name he had forgotten, but who, he remembered, was of German extraction. Later on in the conversation the name transpired, Sherman. The origin of the notion that Sherman was of German extraction becomes clear when we place two words alongside of each other: Sherman = German. Thus what is obscurely suggested by one's own unrecognised failings frequently gives rise to strange opinions, e.g., a conceited man marvels over the conceit of others, one who stutters considers persons who stutter objectionable, one who is always repeating a story takes exception to others who act in this manner, one who is hysterical is critical as regards hysterical persons, and so on. For this reason, if an individual's words or appearance dimly suggest some line of thought, we follow that without suspecting what determined our course of action. To take a somewhat extreme instance. Some one speaks German so fluently and correctly that few detect his non-German origin. There exists, however, a just perceptible difference in his manner and speech. Vaguely influenced, Germans tend to speak to him about international matters, and that sometimes in a tone anything but flattering to non-Germans. Hence we may generally conclude that what we are and what others appear to be, determines our conduct and reasoning to an appreciable extent, although we may not be quite clear at any time as to what is the determining factor.

127.—Organised Re-Development.*

We wish to know how we may distinguish generally between pre-development and re-development. Let us analyse a series of examples.

I was out for a walk yesterday. Passing by a villa, I said to myself, "Here lives M." How did I arrive at this conclusion? I looked at the entrance in an idle way, when, the eye easily gliding along, there suddenly evolved a certain feeling. I then muttered: "Here lives M." What made me draw the distinction between this gate and other gates? There are several counts in our answer. [Analyse such an instance.] (1) The attention was easily satisfied, and organically there evolved (2) a certain feeling, and that again evolved into (3) a rapid and intelligent survey of the object. These states were followed, on the ground of organised reaction, by the announcement or feeling of recognition. Looking at the next gate, after passing M.'s house, none of the above states are repeated.

I am asked whether I can re-develop a certain verse, and I reply, "I will see." I then unhesitatingly repeat the lines, and say that I can re-develop the verse. Why do I assert this? Could I not have spontaneously created the lines, or did they not perhaps arise like a gust of wind? I answer that whenever anything is developed like that portion of a poem, the assertion of recognition organically succeeds. A statement of the contrary effect is resisted and dismissed, or else we feel bewildered.

* Gratacap (De la Mémoire, 1866, p. 252) writes: "To recall a fact is not to create but to conceive and recognize that which we have on former occasions perceived; now the faculty of conceiving and recognizing that which we have already perceived is derived solely from the power which we possess to associate diverse ideas among themselves and in turn, the association of ideas depends exclusively on the power of combining habits, which is the property of the principle of thinking." Memory is only a habit.
Normally we can also test ourselves and others, so as to settle the fact at least for practical purposes. If we do so, we find that we cannot fabricate verses, tunes, etc., at the dictate of the fancy. All those systems which were membered would appear as connected with some event in the past.

Repetition on a large scale is exceptional. Usually I should say Yes or No to the question as to whether I could re-develop a certain verse. On what would such an assertion be based? Let us take the Yes and the No answers separately, since the problems involved are not the same.

(1) Suppose I assent. Four reasons, perhaps more, account for that reply.

(a) Perhaps I have often been asked this question; in which case I should organically say Yes, the question and the answer forming one complication. Such an answer would, of course, follow immediately.

(b) Perhaps a certain feeling develops, to which, under the circumstances, there is organically attached the notion of the possibility of re-development.

(c) Perhaps, to assure myself of the possibility of re-development, or for other reasons, I re-develop a line or just a word.

(d) Perhaps I think of some circumstance which warrants my assenting, e.g., I clearly re-develop the fact that I recited the verse last night.*

Such re-development, though indirect, would be coupled with a prompt affirmation. In these four instances much uncertainty prevails, for though we do not usually re-develop anything completely, yet our judgments are generally based on such partial reproduction. We have ordinarily no time to test our memories, the tests themselves being organised; we hurry on. Mistakes are, therefore, not infrequent. The organisation of thought into trends simplifies re-development to the utmost, even at the risk of occasional mistakes, and accounts for the rapidity of thought and action.

(2) Suppose I dissent. Here is an expression to the effect that nothing can be re-developed. The grades of such negations are many.

(a) I dissent because I have often disagreed, question and answer forming one complication.

(b) Some one asks: "Have you visited the cathedral at Sienna?" I rejoin instantly. "No," the answer assuming shape while the question is

* "There is a state of mind familiar to all men, in which we are said to try to remember. In this state, it is certain that we have not in the mind the idea which we are trying to have in it. How then is it, that we proceed in the course of our endeavour to procure its introduction into the mind? If we have not the idea itself, we have certain ideas connected with it. We run over those ideas, one after another, in hopes that some one of them will suggest the idea we are in quest of; and if any of them does, it is always so connected with it, as to call it up in the way of association. I meet an old acquaintance, whose name I do not remember, and wish to recollect. I run over a number of names, in hopes that some of them may be associated with the idea of the individual. I think of all the circumstances in which I have seen him engaged; the time when I knew him, the things he did, or the things he suffered; and, if I chance upon any idea with which the name is associated, then immediately I have the recollection; if not, my pursuit of it is in vain." (James Mill, Analysis, 1806, I, pp. 322-3). A strange thing is not uncommon with me. I know a certain name, well; but I am unable to re-develop it readily. I call up the man's correspondence; but his signature eludes me. I think of him as being spoken of, and all to no purpose. Here we have a temporary gap, an unmistakable vacuity, a partial blindness of the soul.
being uttered. Had he put "Milan" in the place of Sienna I should as readily have said Yes. The reasons which induce us to affirm we have discussed. In the case of Sienna, no affirmation, no feeling expressing familiarity, no vague state, no defined images are produced; and so, in accordance with established trends, I promptly say No.

(c) In my endeavour to answer I may have tried to reproduce, but failed. In such instances, the field of attention is practically annihilated (sec. 30). [Test this yourself.] I cease breathing for the moment; there is a felt strain in the head, similar to a strain in the muscles of the arm, which lasts for a few moments. Then, nothing of the desired nature having developed, I organically reply No, for to the state of unsuccessful effort is attached a negative answer.

(d) I think of some circumstance which warrants my dissent.

(e) I am perhaps not sure whether I re-develop what I am asked. In such an instance, we have undefined feelings. Whenever such thought feelings, i.e., feelings of doubt, belief, incredulity, etc., haunt us, the interpretation suggested by general observation is that nothing reliable can be affirmed, and hence, in agreement with organised reaction, we speak accordingly.

What is true of doubt or semi-connection, is, of course, true of certainty or perfect connection, belief or partial connection, and the intermediate stages between full assurance and disbelief. To take the question of belief, we do not say we believe that we are able to re-develop a system when the conditions point to semi-connection or uncertainty, or disbelief or counter-connection, or when there is every sign of recognition, or when every such indication is lacking. Doubt is a state of indecision, and is, therefore, not confounded with belief which indicates partial justification (sec. 99b). [Experimentally the states of doubt, belief, disbelief and certainty.]

128.—Novelty and Familiarity.

I have referred to remembrance and its denial. To obtain a complete analysis, we shall consider the meaning of novelty. I pass by a house in London on the door of which is a brass plate which I glance at, and read "Bevirs." My reading is slow, unintelligible and deliberate, evidently requiring more time for development than would a known term. Suddenly it dawns on me that the syllables are German. The word proper shoots now into the light. [Analyse such instances.]

While I attached no meaning to what I read, (1) I proceeded slowly and planlessly; (2) a peculiar feeling of groping was present; and (3) nothing related to the word on the brass plate was re-integrated. When a meaning suggested itself, (1) the word was re-formed at once; and intelligently; (2) there was a feeling of ease; and (3) there were dim memories connected with the word. To the former state we organically attach the notion of novelty; to the latter that of familiarity. In novelty there was to be, broadly speaking, assiduous attention; while in what is familiar, there is light re-attention; hence the lesser quantitative effectiveness in novelty. We
enter St. Peter's, we will suppose, for the first time. The loftiness, the spaciousness, the many-coloured marble pillars, tombs and altars, the huge masses of sculpture have a bewildering effect. The attention is captivated wherever it turns, and nothing awakens memories except of other places. This is contrary to what would happen if our business called us there every day. Another example is readily forthcoming. We regard the stately columns of the British Museum with wonder and with awe. It is the first time we have seen them. The entrance hall with its treasures also charms us. Time passes, and we frequent, as students, for months together the historic Reading Room. Neither we, nor the body of readers, seem aware of anything striking or beautiful in passing in or out. Everything touches the threshold of indifference. We have become familiar with the place. The attention has been satisfied—allowing for a mean ideal, and seeks for new materials. Novelty, then, has its defined conditions.

Experimentally looking about me, I learn that, to a large extent, everything is familiar, and nothing wholly novel. What has, therefore, been said above, implies intimate and interested familiarity on the one side, and tantalising semi-noveltve on the other.

129 — THE GAINING VOID. *

"What is the French for 'slipshod?" some one asks. I answer that I have the word on my tongue, and that I am sure I know it. [Examine such instances.] Again and again I feel it meaning, as one feels the approach of the sunshine, and again it vanish, as if the sun were sulking behind a cloud. I seem to be chasing the word as a bird chases a butterfly. What is this haunted thicket, this whirlpool which will not let us rest; this mixture of certainty and ignorance? After the expositions of the last chapter, and after what we learnt in the preceding sections of this, little requires to be added. These harassing combination feelings hold the word wholly or partly in solution, the problem being the method of precipitation. The various changes in these obscure feelings are significant, and as for the interpretation, organized reaction sees to that. Such feelings are normally accompanied by re-development, and that is why we presume to know. Along with B, a system re-developed, there has nearly always gone A, a certain combination feeling. Re-developing A and then B, there gradually develops a feeling of confidence that where A appears, B will follow. The circumstances alone define the meaning of the feeling. Its quality does not differ from that of other feelings which are differently interpreted with different circumstances.

Re-development is frequently partial. We are unable to reinstatate a person's name, but we feel assured that the first letter of that name is G. [Keep notes of such instances.] Thus wishing to think of "scone," I am certain that it resembles the word "stone," so also the nearest approach to "impure" is "incurite," similarly the name "Lockroy" is the nearest approach I can make to "Cowdroy." A study of imperfect redevelop-

* See James, "Psychology," 1884, pp. 251 ff.
ment ought to form a stepping-stone to the discovery of some of the chief problems in memory. It certainly is remarkable, that desiring to re-develop one word, we should re-develop another with a similar sound, and feel that the word we are angling for bears some resemblance to this. Where the hitch lies it is difficult to determine. [Experimentally tease your memory for proper names, and note results.]

Finding it difficult to recall the name of Plutarch, I determined to insist upon re-developing that name for the purpose of watching its emergence. I felt sure that the name began with *P*; or, probably, *Pu*. I then deliberately re-membered names beginning with *P*; but in vain. I thought of his writings and his life for the purpose of seeing whether these would suggest the name; but without success. For three quarters of an hour the problem incessantly recurred, and in such a way as to prove beyond a doubt that the recurrence was due not to association but to recency alone. I then sat down to enter in my note book the history of the attempt. The first words shaped themselves as follows: "Have watched a case of... Plutarch." When I came to "of," I felt I had to describe the kind of case, and the suspense lasted only two or three seconds before the name sought for developed—out of nothing as far as associations are concerned. [Experimentally vary the above.]

130.—The Part Stands for the Whole.

Events in normal thought are not re-instated in their entirety. A certain individual has a peculiar gait; he shuffles about; he walks rather hurriedly; or he mumbles while abroad; and that detail is all we generally re-develop of him. Ordinarily, therefore, we picture an object only in part, while the summary feelings which accompany the image do the rest. Imaged events must generally be interpreted in this manner. In thinking, for instance, of a procession, the banner bearer, with the re-developed feelings, forms the substance of what is re-developed, or we obtain a glimpse such as haphazard photography yields, though without its completeness and clearness, or the corner of a banner, or some accidental circumstance, is pre-developed. The tendency, in harmony with ch. 3, is to re-instate the minimum and to suppress what is superfluous. Generally speaking, as far as events are concerned, it is correct to contend that we re-develop only fractions of them, and that these are determined in the first instance by any trifle which chances to challenge our senses.

131.—Why the Memory Plans Forward.

When we have once learnt to read from left to right, we find it hard suddenly to reverse the process. Omitting secondary considerations, the explanation is simple. While we look at the first letter, we already organically adjust ourselves to read the second. [Observe.] The process of spelling letter by letter is, therefore, not a pure step by step process; and when we accordingly attempt, without practice, to read backwards—there being no organised tendency to move to the left and a strong one to move to the right—we necessarily meet with difficulties. Of course, as we might expect, practice soon does away with the difference between forward and backward reading, so that after a little trouble, figures can be read in either
direction with equal facility. [Test this.] What has been asserted of reading holds true generally. The order of re-collection is psychologically indifferent, and dependent on usage. The reason that we normally re-develop in one order is equally obvious. Our brains are no playthings, and the central nervous system, having seriously to deal with an environing order which is tolerably stable, is, therefore, itself uniform in its reactions. Where, for whatever reason, a divergence is sought from an established order, there the diversity is obtained.* [Change the order of re-collection.]

Of late, as previously mentioned, I have been learning a phonetic longhand. While I can almost instantaneously picture words and letters in our ordinary writing, I was unable at first to do more than slowly re-integrate letter after letter of the new alphabet. Gradually the power grew, and by the time I had written one letter I re-collected its successor. I strained in a forward direction, the attention being expectant. In reading, too, I had at first to attend to each letter for an appreciable period, and when I had deciphered one letter, I strained for the next. As I grew expert, the forward tendency became marked. I rushed along the letters, like a flame along a string of gas-burners which automatically light each other. Later still, there were attempts to guess at a word from its general appearance, and this last stage seems to prove that we do not ordinarily decipher in succession every letter in a word; but that we first guess at a letter, and at last at words and familiar sentences. It will be good practice for the student to learn about ten consonants and three vowels of a shorthand system, and determine the appearance and disappearance of various images. As an experiment in organised reaction the meaning of the characters might be changed after they are thoroughly learnt.

132.—Vividness is no Test of Objectivity.†

I look at a book which lies before me [examine a similar instance] and also analyse the image of the waves dashing against the concave sea-wall at Scarborough. Which is the reality? Or are both memories? Or are both primary systems? I decide that the book is real, and that the curling waves are only re-developed. But on what ground? I do not do so because of greater vividness alone. Again and again my imagination is as vivid as the reality [is yours?], often even more so. An image of a moon-lit night or a landscape at noon looks far more brilliant than a momentary vision of a room by candle light or a road in foggy weather. If I re-develop things which I know well, they appear as they do when I am face to face with them. Rooms that I am thoroughly acquainted with

* See Ebbinghaus, Uber das Gedächtnis, 1885; also Bradley, How do we Remember Forwards and not Backwards? 1887; and specially Ward, Psychology, 1886, p. 61, footnote.

† The following two points must be borne in mind in reading this section. There is first the question of the "simplest case" (sec. 136). It travel by night and, looking out of the open window of the railway carriage, I see a single light. Except for my awareness that I am in a lighted compartment, and the fact that I cannot dim the light at will, there is no setting. So, sitting in a wood, I hear the occasional bark of a dog in the distance. Here there is virtually no aural setting. In such simple cases as those here mentioned, we have the nearest approach to primary sense affections which are indistinguishable from secondary ones. The incontrollability of the former and the lack of the power of dismissing the sound remain almost our only guide. If we are at all absent.

The second point is also an important one. When I am actually on the scene, I not only see the waves, but I hear them; I smell the charged air; I feel the wind. In re-collection, however, almost everything except the visual factor is ordinarily eliminated (sec. 120).
look to me [do they to you?] as real in secondary as in primary observation. There is no veil, no semi-transparent film, drawn over the image. So also when I glance at a passer-by I immediately afterwards re-develop his image with the full vividness and detail of the primary life. One difference between primary and secondary systems lies in this, that I can freely fix the book for many seconds; I can observe innumerable fresh details; I can apprehend the action of many forces on the book; and I can read page upon page of new matter. Again, whatever I notice round the volume is equally distinct. It is not so, however, with the sea-piece. Scarcely do I attend to it, when it vanishes. I cannot discern minute details, walk along the shore picking up pebbles, measure the road, or scan people’s faces. Detail is practically absent, and the secondary or memory environment arouses feelings and images such as I connect with re-development. The collateral pictures come intermittently and possess no freshness. Though I know the waves to be quivering, I yet see little or none of this. The feelings of active observation are wanting. Glancing at an object for a moment I only discern certain features, and these alone can naturally be detected in re-development. Continued exploration of the image does not yield fresh items, while continued scrutiny of the visual field gives rise of necessity to new points. In dream life (sec. 229), this effect is achieved by imagining fresh details. If we could freeze what we see at a particular moment, our eyes would be, as in secondary vision, incapable of dwelling on the object for more than a short time, and there would be, in consequence, no continuous flow of information. I can, however, fix an image when I think about it, or when the attention is otherwise engaged.

In re-development the re-instated object generally appears without appreciable environment. Looking at a street poster on a hoarding [try this] and then shutting my eyes, I re-develop the image of the poster and scarcely anything else. Yet when I observed the original, a quantity of other objects, progressively less defined, fell within my view and freely changed as I altered my visual position. When the place as well as the re-developed object is familiar, the surroundings are re-developed and the object appears set in a proper frame; but even then our spiritual sight cannot readily range as in normal observation. Ordinarily the attention expended on viewing the setting is probably not sufficient for the purposes of re-development, while at the same time, the frame-work being of no interest, we tend to ignore its existence. So when we see a friend, in many settings, the tendency, in primary as in secondary development, will be to suppress, to ignore, and, therefore, to forget the settings. (Sec. 69.) Either the absence of a frame, or the mechanical presence of one particular one, tends to confirm us in our implicit judgment that we are dealing with a secondary, and not with a primary system. The more we experiment in this direction the greater appears the divergence in this respect between normal memory and normal observation; the former being without and the latter within a setting. Also, when we re-develop a scene with our eyes open, as they normally are, the image is checked by the systems we are deriving from our surround-
ings, systems whose richness strikingly contrasts with the poverty of the image.*

I conclude, therefore, that the book is external, but not the waves. Organised reaction settles the matter in practice. I could write down what the image of the sea yielded, go to Scarborough, and compare my notes with the reality. How feeble the former would appear when brought face to face with the latter. We do not, however, wish to make the journey. I, therefore, shut my eyes, with the book still in front of me. I then open them and commit to paper the information gathered by the thought of the volume. Then I study the book itself, copy some pages of it, compare the notes and find how inexhaustible the primary world is when contrasted with the secondary world.† (See also sec. 124.)§

I notice that what is re-developed immediately after pre-development, is most vivid and detailed, besides being accompanied by a kind of memory feeling, while as the span of time widens vividness and detail diminish very considerably. In the latter case we tend to confound imaginations and other adventures with our memories. Suppose, for instance, that I re-produce a short sentence from a book. In reading for the first time the cluster of words, I see, however dimly, its immediate surroundings. When the re-development is recent, I actually feel these surroundings. I also see the white, shiny, smooth paper with the sentence visible on it. Gradually the detail disappears feeling, whiteness, shininess, smoothness, printed letters, ease of re-development and, lastly, every vestige of the sentence. Stout (Manual, 1899, p. 402) supports a different solution; he says: "The concept has an aggressiveness which does not belong to the image."

So also Ziehen, Frisaden, 1891, pp. 96-97. Some weight must be allowed, to the distinction; yet the very difficulties of the memory problem show that sensory aggressiveness is an unsafe guide.

The range of sight or hearing is the same outwardly and imaginatively; in fact, the latter is a copy of the former. In secondary speech I note the same pauses and changes in tone as in ordinary speech, though sounds are frequently slurred. [Examine.] In secondary sight I observe the same method as in ordinary sight, of turning at a certain time rate from picture to picture and from one part of a picture to another part, while the images are re-developed in the positions in which they were originally studied. Often, indeed, the secondary time rate is slower than the primary time rate. [The subject of this section should be carefully determined.]

Egger (La Parole Intrieure, 1881, p. 69) considers inner speech to be quicker than ordinary speech. That may be so under special circumstances; but is not otherwise borne out by my observations. As to the the spatial position in which images are re-produced, experiment, as well as see Giesler, Aus den Tiefen des Traumlebens, 1890.

133.—The Present Ends Where Obliviscence Begins.

We have assumed a present and a past. What happened in the present, we called reality; what we referred to the past, we named memory. What

* A similar effect of reality is produced by the state of vision when my eyes are shut, and just before waking my imagery is distinctly visible in the eyes.
† See Mg, except the creation Physiologic, 1890, pp. 129-3.°
§ See Mg, except the creation Psychologie, 1890, pp. 139-4.
do we mean by the present? What constitutes the past? The answer to these questions is not self-evident. When my eye travels across a landscape for one second, is not the observation of the first moment passed before that of the second moment arrived? If so, as we have already stated in Sec. 107, does not all observation, with the exception perhaps of a most insignificant portion, imply memory? Is there such a thing as a discrete moment of time? And, if so, can anything be observed within such a span? Do not discern anything when an object is quickly passed before my eye? Is then all discernment a question of memory?

The more we consider this point the more evident it becomes that the psychological Now must not be taken ideally. Let us examine this Present of ours. It is not a bare moment, for such an one is inconceivable. It is not the shortest strip of time imaginable, for in such a space we can observe nothing. The psychological reply must be founded on what was stated of the first degree of obliviscence. For some seconds or minutes (sometimes for some hours or days when particular aspects are concerned) our memory is thoroughly trustworthy and complete, and this period limits the present. We live in the Now while we can re-instate details with extreme freshness and ease. Hence with a perfect memory, if we ignore the position of the systems in the total thought series, the Past is swallowed up in the Present. No other definition is possible. The question you put, the hollow echo of which the empty hall still caresses, is it a dream, was it delivered now or twenty years ago, or was it uttered at all? Normally we are not perplexed. We answer the question as if it had been asked this moment. (See, however, Sec. 124.)

The Present, then, is the arena in which we fight out the problems of objectivity and memory. Here we experiment—now pre-membering, now re-membering. On the above description we normally stake our belief in the distinction between what is observed and what is re-produced. When what we scrutinise has one set of signs accompanying it, we call it observation; when another, memory. This is the sole meaning we can attach to the difference. We possess no other solution of the riddle.

I am asleep and dreaming that I am on one of the Boulevards in Paris. I reason with myself that this is impossible, that I must be dreaming. I only went to bed just an hour ago, and how then can I be in the French capital? No conveyance exists which could transport me so swiftly. I must be dreaming. I try to settle the question by an appeal to the senses. I observe the breadth of the pavement; I see the racing double stream of people; I look in at the shop windows; I touch the chairs of a café; and I listen to animated conversations; but still I dream. After some further display of scepticism, I at last agree that I am dreaming. In the morning I wake, and discover my mistake. Was I dreaming? A Chinese philosopher is said to have dreamt that he was a butterfly. Which was the dream form; the cause, the human figure or the dream creature? All wings? We wisely decide for our sanity is dear to us that the dream of himself as a butterfly. We could possibly convince him that the dream
imagery only imposes on a weakened judgment, and that the resemblance to reality is feigned.

I have concluded the discussion as to what points to the Present and what to the Past. It is true we have encountered no absolute boundary line except that attained by the method of localisation in a series; but we have discovered what makes us ordinarily distinguish between the various degrees of memory and reality. Familiarity, supported by organised trends, has supplied us with the explanation. Memory is not simple, it is distinguished under ordinary circumstances by a definite but large variety of landmarks which serve as guides. If these play us false, then what security is there for anything? We do not envy the sceptic who holds that all distinctions are untrustworthy, as they certainly are sometimes.*

134. —The Dynamics of Memory.

(1) We do not Re-develop Everything. — Memory approaches perfection for a second or two alone, and only among fabled creatures, therefore should we think of finding any one who freely re-developed everything and in perfection. Who, on being challenged, recite a volume of eight hundred pages after a first reading? Who can count in memory the number of pebbles he has seen on the sea shore?

The statement with which the last paragraph was opened demands rectification. It only holds when we are anxious to re-develop, or are not pre-occupied. While humming a song we perhaps fall into reflections and become oblivious of what we are doing. We perhaps leave off without knowing it, quite forgetful of our singing. For example, I re-collect that I have read but a moment ago the word “Tailor” on a sign board, and yet I have not the remotest notion where I read it—whether to my right or to my left, far ahead or near by. [Collect and analyse such cases.] In simple organised activity such forgetfulness is usually the case, and thus we do not even for a second re-develop what we have been engaged in. As soon as a step is completed, an object seen, or a sound heard, they cease to exist for us, and especially is this true of systems which fall within the margin. In the routine of life we meet the same thing. Walking along the street most objects or noises are no sooner remembered than they are lost to us for ever. Who can re-develop what he has read when his thoughts have drifted from the book? (Sec. 110.) [Test the statements, more especially the last one.]

(2) Memory and Effort.† — We have implied that only that is re-productible which has been attended to with a certain assiduity or interest. It is equally true that all orderly, remote and effective recall requires appreciable effort. [Carefully verify this.] The memory

* The question of objectivity will be further discussed in ch. 8.
† Dugue, Le Méméoire Brute et le Méméoire Organisé, 1894.
‡ Locke (Human Understanding), bk. 2, ch. 10, sec. 4, speaks of cases where “ideas in the mind quickly fade, and often vanish quite out of the understanding, leaving no more footsteps or remaining characters of themselves than shadows do flying over fields of corn.”
does not as readily empty its contents into the basin of thought as a river discharges its water into the sea. To re-develop what is appropriate, constitutes a task, especially when we are circumspect in our procedure. Our winding private thoughts (sec 229), owing to the absence of necessary strain, tend, therefore, to be inconsequent and absurd. Thus, in a restaurant, having chosen a certain dish, I begin to think about a certain author. When the waiter arrives, I just escape asking him for "Mr. Smith" (sec. 229) [Observe such cases] In unspoken thought confused re-development is common, and is entirely the result of the absence of strenuous effort. In dreams, accordingly, where the neural tone is reduced re-development is chaotic, and from this source and that of hallucinated reactions spring the universally prevailing originality and mania of dreams (ch. 10). Normal re-development, then, consumes a notable amount of energy. In a similar way, the production of every simple and turn of thought requires sensible exertion [Verify this last statement]

We have reached now the dynamics of memory. Attention, in the first instance, must attain to a certain high degree if the subject is to be reproducible. In monotonous activity or in the field which is furthest removed from the focus of attention, this degree is not attained, with the result that production is there lacking. It is almost superfluous to repeat that the absence of sufficient attention is accounted for psychologically. Attention being limited, we are apt to attend least to what yields least organic satisfaction, and even paced routine, and all that fills without the focus, is of this unsatisfactory nature.

We distinguish, broadly speaking, two means by which to obtain the requisite measure of assiduity. First, we possess normally a definite amount of energy of which we must rid ourselves while we also have certain organised wants. These wants, in connection with the pressure of energy, ensure attention of an adequate type for re-development. Secondly, we perhaps expressly wish to re-develop. I do not mean by this that we necessarily formulate our desire in so many words, or in any words, or that we harbour the explicit notion of wishing. Usually, as explained in the last chapter, an organised feeling precedes re-development. In proportion as this feeling is obvious, or to put it differently, in proportion as we connect the notion of re-development with the process of re-development, so pari passu, we remember the fact. Also, the more transparent our aim, the more successful will be the result of attention, since lucidity implies that no labour is wasted in delay and idle search [Test this statement].

G. W. Lecky (Secret of a Good Memory, 1880) aptly emphasises in his little book the fact that where we wish to re-develop, there we should read with the notion of re-developing before us. Experiencing along this line, I find that when I emphatically turn away from a subject as if I had done with it, it frequently ceases to recur. I have in this way, to my astonishment, dismissed news for a time which otherwise would have occupied moment by moment for hours. Usually we do not dismiss a thought like this: the excitement sensibly continues in consequence; and spontaneous or ready re-development follows. I can, therefore, appreciate Mr. Vermilye's remarks on forgetfulness, where he refers to the fact that we sometimes quickly forget (On Forgetfulness, 1877, p. 449). See
also Stout, Manual, 1898, p. 96). Indeed, the difference between a good memory and a bad one will in this manner often be decided by the presence or absence of this factor. [Experimentially tested]

If special effort or tone, as is contended in this section, is a maternal factor in development, it seems to suggest that where, for any reason such as absence of practice, strain is absent, there a general memory will scarcely exist. From this it is but a step to the assumption that a general memory hardly exists outside a developed society, and not, therefore, animals, like dreamers, redevelop almost nothing of a complicated character. Arguing in this direction, we can see that the secondary world, as far as it is the reflex of the primary world, is probably a late product of evolution. At first we have simple contractility; then contact with the environment produces changes such as the hardening of the skin in those who are engaged in heavy work; then actions are redeveloped in part, and, lastly, in this very crude plan, all happenings are reproductible in a desirable way, so as to form a mimic world,—a simplified model of the outer world,—by means of which we may forestall the future (sec 137) (See Smith, The Relation of Attention to Memory, 1895.)

(3) Repetition and Memory Another interesting fact now becomes patent. Repetition as such is no guarantee that an incident shall be engraven on the brain. In ordinary organized activities we repeat indefinitely, and yet altogether fail to redevelop the steps at will. Let us, however, leave such occupations on one side. Every one knows that when we are not interested in a subject, or when we do not make efforts at re-development, we may mutter formulas for decades without being able to re-produce them freely. I have, for instance, frequently gone to certain numbered library shelves, and yet forgot their numbers until I made a special and decided effort not to forget them. So also in a building which I must have scrutinized hundreds of times, I only redevelop one small gate-way where there are two. It is also generally admitted that we succeed best in fixing what is to be redeveloped, other things being equal, in proportion to the predominance of some interest or of some determined effort. In other words, the application of strenuous attention is a crucial factor in the dynamics of re-development. If we could apply all at once the energy which usually lasts us for several hours, we might redevelop a difficult proposition without any repetition; but this road is barred (ch. 2). In the Bank of Attention no thousand pound notes are issued. The maximum and minimum is a humble five pound note.

(4) Attention Energy cannot be applied all at once. Repetition is normally necessary if we are to be able to redevelop an incident after a time; but repetition can claim no virtue of its own. It is required because we cannot make a great enough effort at one attempt. By repeating our attempts, we perform what we should accomplish at once if we had sufficient energy to dispose of at any given moment. It is exactly as when a man is told off to remove a cartload of bricks: he transfers a few at a time until none are left on the cart. As all bodily energy is one (sec. 34), so the explanation involved in dealing with the bricks holds good without any reservation for neural work. In memory, therefore, we require reiterated effort.

(5) Effort must be Intermitent. When the bricks are in great numbers,
we cannot, owing to human limitations, keep on removing them without intervals of rest. In collecting material for the memory we, therefore, encounter a third factor—time, the first factor being a certain strenuousness of effort, and the second the necessity for repetition. We have already learnt (sec. 28) that persistent effort is exhausting; i.e., that it paralyses that portion of a brain area which is affected. To repeat a theorem vacantly a thousand times a day will not assist us much. To reiterate it vigorously a hundred times a day would saddle us with an unprofitable headache. We must, therefore, vigorously repeat our attempts at not too close intervals. There is an additional reason for judicious pauses in that we are not able to attend for many moments together to any detail (sec. 29). If we think, then, of our subject in connection with other matters, we are distinctly employing added labour without tiring ourselves. We persist in repeatedly attending in the easy manner which we have found to be conformable to the nature of the attention (ch. 2). There is no safer method of memorising a matter than by thus thinking about it for hours, assimilating it with various systems. This is different from an isolated attempt to fix the subject, for thinking about a matter is in accordance with the nature of attention, while the latter method is not.

For what period, allowing for pauses, must we repeat? It will be found (sec. 112) that we must continue being familiar with a subject for many months—nearer a year than not—before we can be sure that the subject is at all well assimilated. The later reiterations must be at considerable intervals of days, or even weeks, rather than closely following each other, that is to say, a certain period must elapse independently of the number of vigorous repetitions. Now what relation does this new fact bear to the others immediately preceding? That the lapse of time by itself can do nothing only requires to be stated; but why must the moon pass so many times through its phases before we re-develop efficiently? The following explanation, which agrees with the ones which have been already offered, meets the case. First, a brain area can support little strain or drain; it is exhausted by slight effort. The prostration endures for some time, perhaps for hours; if very trying, for days and longer. In a previous section (sec. 109) we saw how a strong neural excitement persists for many hours and remains in a weakened state some time after that. It appears, therefore, that we must allow a liberal margin between the repetitions. To avoid thinking of the subject is occasionally useful, for attention is most effectively employed after a period of quiescence. Work of any kind, when we are tired, benefits little. Secondly, pondering over a subject connects the parts and binds it to other themes. In such thought attention is spent with increased economy. We also know (sec. 35) we weary of subjects as we tire of details, and that consequently we do not recur to them with ease. Lastly, when the brain is rested, when we are not burdened with the fancies of the preceding hour; when no irrelevant neural momentum is at work, pertinent systems are likely to evolve. On fresh thoughts we readily dwell; on those of the last hour attention has
no power, for it has left them paralysed, with their connections cut. In cramming we have an echo rather than a memory of the facts.

(6) The Old in the New.—Still another aspect dealt with in chs. 3 and 4, may be here enlarged upon. Subjects are closely related to each other. If we are sufficiently acute, we can recognise much of the new —perhaps most of it—in the old, and in that case we need learn little or nothing by heart. In so far as such recognition takes place, our task is made bodily lighter, for we have so much less to con over; and if we think at all of the present in relation to the past the boundaries of knowledge are sure to be extended. It is a well attested fact that a detail is difficult to re-develop when isolated, though readily re-developed when connected (ch. 4). In such instances attachment to common notions is of signal service, since these notions are frequently and easily re-developed.

(7) The Superiority of Observation.—Our explanations emphasise a fact which might be considered exceptional, and to which we will, therefore, refer. We read in a paper of a great fire and very soon afterwards the news has disappeared from our thought. Had we been spectators, however, we should re-develop the occasion for a long time. The shouting of the firemen on the approaching engines, the mad gallop of the horses, the smoke and sparks issuing from the furnaces, the prevailing confusion, the house on fire, the spreading of the flames, powerfully appeal to us. Instead of attending for two minutes to one of several shadowy newspaper paragraphs, we live through a series of graphic events for perhaps two hours. When we leave the scene, the incidents, as noted in sec. 110, haunt us. The disturbed brain area repeatedly excites us to reflections on the subject. As a consequence a large quantity of attention is spent in a certain direction in a short time, and the event is readily re-developed. Were it our duty to attend fires, we should expend little labour in impressing on ourselves the incidents of a particular conflagration, and no event of that class would be forgotten for long. On the other hand, had the house been our own, attention would have been prolonged, re-development frequent, and the images probably persistent throughout life. This example makes it obvious why observation is superior to hearing accounts or reading records of an event. More attention is absorbed in observation than in hearing accounts.

We read in a newspaper the story of some terrible earthquake. We hear of towns destroyed, of the deaths of thousands, of the horror and terror and privations of tens of thousands of our fellows. The whole of the news is contained in a telegram of a score of lines, yet we forget perhaps the tragedy. The explanation is obvious. We do not read the account and then turn to another paragraph, not re-producing the calamity till two years later. On the contrary, we are deeply moved, and for weeks the thought, like a resisted temptation, comes and goes. Effective attention is here natural and simple, though it is impossible that in normal life everything should strongly impress us. In the latter case the nervous system would soon be prostrate. It verges on the absurd to grow excited over a
Latin irregular verb or over the date on which some petty monarch died. Nevertheless the absorption of the attention explains both sets of cases.

We have explained the re-development of remarkable events. A similar solution applies to a type of less obtrusive facts. On a walking tour in Switzerland we see and re-develop much. Glimpses of numerous scenes satisfy our love of wonder for years. A glance at a lake is capable of being re-produced ten years later. Here there is no apparent perturbation, but still that which is observed sinks far down. On the whole, this is but another special application of the use of attention. That which I noted touched me deeply; I recurred to it on many occasions; and only as the interest waned, did re-development cease to be possible.

One obscure set of cases our theory apparently fails to explain. Sometimes we re-develop an event very frequently, though it has no special interest for us. We are reading a book as we cross a meadow, and we casually notice the hawthorn hedge which fences it round. It has no traceable claim on our attention, yet now and then it is recalled. In this way, if we are observant, we often know that a trifling episode has come to stay with us. [Can you trace such episodes?] Many of our youthful and lasting memories are of this apparently meteoric and unteleological nature. We must assume that the neural mechanism is at such moments abnormally sensitive, or that the situation is in some other way unusual. [Carefully examine such cases.]

Another order of memories—a seeming exception—is readily reduced to rule. I read a book on Logic and easily re-instate its contents, and yet there has been little effort in the reading. How is it that I re-develop so much with so little strain? I answer that I had previously read a good many volumes on the subject. With most of the notions, terms and trains of thought in this book, I was acquainted from previous works. Only the new matter had to be attended to and that was scanty. Nearly my whole attention spread itself over a few scattered remarks instead of being occupied by every sentence. The better, then, we are acquainted with a subject, the more readily is it pursued (sec. 44). The reading of the book required little memorising. Even what seemed new was largely made up of what was old.

(8) Child and Adult.—It is easy to attend to what is new when it is shown to be implicated in what is old (sec. 44). Instead of re-developing a new fact, we only require to re-develop an old one in a slightly different dress. Hence we expend less energy in appropriating the fact, and we commit it more easily to memory. As we grow older, there is comparatively little to be acquired which is quite new, since one or more aspects are sure to be familiar. To the adult new truths are partially new. Thus we are apparently learning half-a-dozen times as quickly as a young scholar, when in truth we are proceeding at the same pace, or perhaps more slowly. In this way the groundwork of assimilated knowledge enables the pupil to progress at an ever-increasing rate of speed, and this makes it almost criminal to withdraw children from school while yet young. Accordingly,
though the matter which the child makes his own grows in complexity, the relative strain of attention as regards a subject, positively decreases, allowing for growing strength and interest. Any one who re-develops much, will with ease re-develop much more, whereas who re-develops little, will laboriously add but a trifle to his store.

(9) What has only Extension is Difficult to Re-develop.—Some classes of statements are somewhat difficult to re-develop—at least for some persons [is it so with you?], and these appear to be such as have no evident relations. We re-collect without hesitation that the Wars of the Roses implied two roses, one white, the other red, and also the House of York and the House of Lancaster. Which rose, however, represented which House? White has no special affinity to Houses, or War, or anything else. Colour has no intensive meaning. When we describe one individual as good and another as bad, the adjectives suggest many details and cannot, therefore, be confused. If, on the other hand, I said: This man lives in a white house and the other in a yellow one, the case would rest on a different footing. White is but white, and yellow nothing but yellow. A man's goodness, on the contrary, points to a variety of concrete facts.

Take another instance. The differences between an acid and an alkali are manifold, and they could not be mistaken one for another. A litmus paper displays also a quantity of special characteristics. Yet a blue litmus paper, to the ordinary apprehension, is distinguished from a red one only in colour. Will dipping a blue litmus paper into an alkali turn it red? Or should it be brought into contact with an acid for that purpose? If the terms red and blue were restricted to the process we are interested in, no difficulty in re-developing would be felt. This, however, is not so. We constantly employ these as well as cognate terms for naming certain collective aspects of objects.

What is true of colours, is true also of figures. The latter have no contents, beyond the quantity they indicate. Thirteen men, thirteen circles, thirteen ideas, mean just thirteen, nothing more nor less. Suppose we aver that Socrates was good, Buddha was good, Jesus was good. Is the meaning we convey on the same plane as that of the number thirteen? No. The goodness in each instance includes a medley of disparate individual acts and expressions. The word "good" sums up their separate idiosyncrasies. In thirteen good boys, thirteen good men, the two "thirteens" are of precisely equal value. Not so with the two "goods," for the boys were perhaps thought of as punctual, the men as brave. Accordingly, if all we knew of Marcus Aurelius and Nero amounted to this, that one of them was good and the other bad, we should be as likely to condemn Marcus Aurelius as to praise Nero. Hence the trouble in re-developing dates and figures.

The same reasoning applies to concrete compound relationships. For instance, do afferent nerves enter to the posterior portion of the spinal column, and do efferent nerves issue from the anterior portion, or vice
versa? Is the grey or the white nervous matter modulated? The mnemonic "A pea" (afferent, posterior, efferent, anterior), might set the first question at rest by making the relationship intimate, "Earl Grey is not suited," the second. Without such artificial assistance, many persons would never re-develop disconnected couples. In a mnemonic we impose tension on that which otherwise possesses little or none. The adjective "grey" offers no attachment; nor the words "afferent" and "posterior," nor 1215, the date when the Magna Charta was signed. In the last instance we can, by method, create natural mnemonics. We suggest that the sum is one the difference between the two couples of which (1215) will equally divide the separate couples. While we are constructing our legend we are busying ourselves about how to re-develop, and this is time well spent, for we keep the stream of attention playing about our problem. In this way, especially for short periods, figures are readily retained.

Proper names are likewise hard to re-develop, though they do not present as many obstacles as the other classes which have been mentioned. They have no content, it is true, for three very different persons may boast of the same name. They are, however, more varied and restricted. Perhaps they offer an additional stumbling block—or is it in advantage?—in that they are not so frequently employed as some other classes of words. [What is your position as regards the problem of this section?]

Lastly, it is generally recognised that words, when ringed in sentences, are difficult to re-develop. Here also the words are employed in so many different sentences, that it is not easy to connect them with any particular one. Accordingly, of the innumerable sentences used in conversation, few, if any, are literally re-developed, and hence results the difficulty of learning verbal definitions, and the welcome we extend to verse. [Test this section experimentally.]

Note, however, that what has been stated above is modified by the action of permanent interests. Thus a cricketer easily re-develops figures relating to runs and wickets, and thus the actor readily learns his part. In these cases the figures and sentences receive a special meaning from the special circumstances, and, therefore, cease to be abstract and contentless.

135.—The Physical Aspect of Memory.*

Except for frequent reference to the part which attention energy plays as regards the memory, no allusion has been made to any physical correlative of secondary development. The reader must, nevertheless, feel that what we find outside physiology offers no systematic view of the facts under investigation. As well might we argue that the smoke issues from the funnel of a locomotive drives the train, or that the other half is a correct copy of the inner structure of the engine; as well might we ignore the silent ocean of air at the bottom of which we live and take note only
of puffs and gusts of wind, as to compare what is immediately given with what is revealed by physiology. No; not only are sensations and images, i.e., unexhausted systems, relatively sparse, disconnected and semi intelligible; but we have seen reason to believe that many of them are differentiated by circumstance alone. [Test.] The more closely we eye our material the more impossible it becomes to assume two exactly parallel series—a non-neural and a neural one. If the one is a precise reflex of the other, then chaos rules in both realms, and we are compelled to postulate, as in the reported lives of some saints, a miracle at every step.

After a minute survey of the facts, we conclude that what is immediately given at any time constitutes only a partial and imperfect complement of the physical data of memory. We decide that only an intelligent appreciation of the nervous process yields useful scientific notions on the subject, but as neurology is yet little advanced, we cannot turn round and examine the subject in its physiological aspects. We must be content on the one hand with acknowledging the impossibility of bringing a consistent order into non-bodily, unexhausted systems, and, on the other, with weighing the results by analogy. This is no outrage on the scientific method for we have solid grounds for believing that the brain, as a part of the human structure, acts in accordance with the uniformities governing the general bodily mechanism.

Let us examine these indirect evidences so far as they relate to memory. We vigorously exercise the muscles of the arms, legs, chest or other contractile tissues of the body, and after a time we observe that they have visibly grown and hardened, and are more supple and quicker in response. Whatever we may question, it cannot be doubted that a change in the muscles is evident to sight and pressure. To this should be added the fact that what at first could not be compassed by physical force, is readily accomplished after training. These every day happenings are beyond the pale of uncertainty. Now appropriate exercise, translated into our phraseology, means the effective employment of the attention. When then a certain amount of force is expended for a stated period, broken by intervals, we obtain as a result larger, harder, stronger and more efficient muscles. In other words, appropriate physical exercise produces desirable and definite physiological changes. In ch. 3 we enlarged on the meaning of appropriate exercise. What we have asserted in this chapter and in this connection of attention energy, rigorously holds of bodily energy in general. Consequently, to obtain the desideratum of strong muscles, we must not put forth less than a certain quantity of energy; nor must we employ more, since the system breaks down under great strain; we must indulge in appropriate exercise frequently, because our energy cannot be spent all at once; and the exercise, to be fully effective, must be spread over a considerable length of time. Much repetition without effort is waste, coupled with great effort it tires, and defeats its own object. Strength and agility once acquired, especially in youth, are apt to persist through many years, even if they be not much evoked. Occasional em-
employment of the various muscles is imperative if they are not to deteriorate. The weaker the appropriate stimulation, the sooner do the effects disappear.

Again, we are aware of the feelings which accompany muscular activity. They are few, obscure, simple, and vary within a very narrow range. We also know fairly well what happens when the muscles are in action, a multitude of them contract and expand, and chemical processes are set going. A nerve-plexus affects the muscles directly in the first instance, and the former in its turn is influenced by several centres. The multitudinous movements are connected with the movements of bones, cartilages and tendons, while the vascular systems sympathize. In this way the physiological changes which proceed when I place a weight on the palm of my outstretched hand, are far-reaching compared with what is immediately apprehended as sight and feeling.

Is it a far cry to apply to the brain that which holds good of the muscles, and, by analogy, applies to the heart, the lungs, the stomach, the intestines, the kidneys, the liver and other parts? Energy spent in a definite way has ascertainable results in every part of the body, from the toes downwards. Shall we insist that the brain is to be isolated like a lobe, that with it alone no permanent and predictable modifications follow from activity, though in both instances the effects are precisely similar and are produced in exactly the same manner? Shall we, again, assert that though the feelings accompanying muscular action do not represent even a small percentage of the physical changes involved, it is otherwise with the relation of memory to the brain? Is there no similar source in both cases for the comparatively sparse, disconnected and unintelligible feelings? We may conclude unhesitatingly that appropriate neural exercise creates more or less permanent changes in the way we have just described, and that these modifications tend to lapse. Accompanying them are indefinite feelings which only hint at the extensive revolution which is proceeding behind the veil of immediate life. What happens when the modified centres are re-stimulated is scarcely suspected, the process being represented very partially by certain vague combination feelings or thought feelings, as when we believe, or doubt or rejoice. These feelings no more typify or explain what is going on than the muscular feelings are a copy or an explanation of the muscular process.

The leading work on the subject of Memory by the quantitative school, which is now fast becoming the qualitative school, is still Lihninghaus, Über den Gedächtniss, 1885. He experimented with nonsense syllables of three letters (consonant + vowel + consonant), employing about 3600 combinations, with a view to ascertaining the number of repetitions required for re-collection under various conditions. In a similar manner he attempted to determine the facilitation which accompanies the attempt to retain any thing, and the relative reduction of time in memorising a set of known syllables in various orders. Though an extremely painstaking book, Über den Gedächtniss comes short of establishing any general facts. Several writers have followed in Lihninghaus' steps.

* The statements in this paragraph may be perhaps best explained by assuming that muscular activity has its place as a part of brain functioning.
Wolfe (Über das Tongedächtniss, 1886) aims at further simplification by restricting the experiments to sounds pure and simple. The following contributions have appeared in the Psychological Review. Münsterberg and Bingham (Memory, 1894) test the relative value of visual, audial and mixed series. Their conclusions are as follows: "When the two senses act together in recollection, they hinder each other" (p. 36); "When isolated, the visual memory surpasses by far the aural" (p. 37); "the memory is impeded by a closer combination of different contents" (p. 37); and, in a continuation of the above study by Bingham alone, "the memory which acts quickly acts better" (p. 458); "the quicker the memory is discharged the better is the result, even when the subjective feeling of certainty is the opposite" (p. 460). In An Experimental Study of Memory, 1894, Kirkpatrick concludes that a thing is re-collected about seven times better when the object is presented than when it is only referred to verbally. Baldwin and Shaw write on The Memory for Square Size, 1895, and Warren and Shaw have Further Experiments on Memory for Square Size 1895, in continuation of the preceding. Smith (The Place of Repetition in Memory, 1896) claims that "the results . . . confirm in general the accepted fact of the efficacy of continued repetition in impressing any kind of subject matter on the memory" (p. 27). Whitehead (A Study of Visual and Aural Memory Processes, 1896) urges, among other things, that "matter memorised aurally appears to be retained slightly better than that memorised visually" (p. 268). Bolton (The Accuracy of Recollection and Observation, 1896) examines a large number of classroom replies to questions relating to the nature of the weather a week ago, the date of Dickens' death, and the like, together with the degree of certainty attached to the answers given. A similar study to the last is that of Franz and Houston, The Accuracy of Observations and Recollection in School Children, 1896. Stelton (Some Memory Tests of Whites and Blacks, 1897) deals with white and black school children. To this list may be added Hawkins (Experiments on Memory for Facts, 1897); and Herrick (The Propagation of Memories, 1897) who deals with the cerebral aspects of memory. See also the following articles in the American Journal of Psychology. Bolton, The Growth of Memory in School Children, 1892; Bergstrom Experiments upon Physiological Memory by Means of the Intervene of Associations, 1893; Billott, An Attempt to Find the Visual Memory, 1897; Smith, On Mundane Min 1896; and Burnham, Memory: His & Isolating and Experimentally Considered, 1889, which contains a bibliography of the subject. Finally, Ross, On Memory, 1991.

136.—How to Develop.

(1) The Problems of Memory.—What problem as regards memory would a pure spirit be compelled to face? We dare not guess. For aught we know he might always be able to re-develop, faithfully and accurately whatsoever he had at any time observed, or he might not in any degree possess the capacity of re-developing a system, or he might re-produce only some things, or only certain objects, under certain conditions; or only dimly and inaccurately. We have no data to warrant

* Herbart preserves his ideas: "All those ideas which we are accustomed to say, are preserved by the memory . . . are incessantly striving upward" (Lehrbuch, 1816, p. 20). So Boullier, Nouvelles Études, 1887, pp. 191 ff., and Ce que Dépendent les Idées, 1887; and Hamilton, Metaphysics, 1877, lecture 30. See also Vachette, Localisation des Sens, 1896; and Kieckht, Les Erinnégies de la Modalité de la Mémoire, 1880.

† Locke, referring to the memory, speaks of "successive created intellectual being", which in this faculty may so far excel man, that they may have constantly in view the whole scope of all their former actions, whereas he would not know he had ever had them slip out of his sight. The Omniscient of God, who knows all things, past, present, and to come, and to whom the thoughts of men's hearts always lie open, may satisfy us of the possibility of this" (Human Understanding, bk. 2, ch. 10, sec. 9).
one conclusion rather than another. Once we leave below us “the solid ground of nature,” any and every assertion is as if shouted into a vacuum.

Psychology has fortunately nothing to do with pure spirits, as commonly understood. Our business in this place is to understand the neural mechanism, and that offers here several aspects of interest. In ch. 2 we saw that attention is defined and limited, and that, therefore, the greatness as well as the smallness of our efforts is determined. Then we learnt in ch. 3 two truths relevant to the present inquiry: first, the brain reacts according to the line along which it has developed; secondly, during the early years of life the nervous system and the body generally have the greatest plasticity and those years decide how we shall react throughout maturity. Then, in the present chapter, we noted that the facts of the secondary order agree with the conclusions arrived at in chs. 2 and 3.

In improving the memory we must, therefore, take into consideration at least three facts: the limitations of the attention, the uselessness of random exercise, and the supreme importance of starting the education of the memory in earliest childhood. Ignoring any of these will assuredly bring disappointment in its train.

(2) Direct Observation.—The first condition of an effective memory is thoroughgoing, detailed, repeated and varied observation. In observing we must not allow the fancy to be our guide, or else we are likely to imagine our facts. We must deliberately and in a determined succession scrutinise the various features of a system as well as study our data exhaustively if we are to re-develop much; we must, wherever possible, observe the objects themselves, and not head descriptions, if they are to appeal to us; and we must keep a careful record of our observations. Only when these conditions are fulfilled, shall we possess a tolerable foundation for an intelligent memory. [The above conditions, and those which follow, should be fulfilled by the student of psychology in all his researches.]

(3) Standpoint.—In all serious thought we ought to be clearly aware of what thing or aspect we wish to re-develop. We must acquire the habit of carefully defining our demand, and must not shift our ground arbitrarily. Certain rules which hold good of the art of observation may for this purpose be employed by the memoriser. In re-developing matters economical, anthropological, historical, ethical, psychological, educational, etc., a day-to-day rule is of great advantage. If, accordingly, we wish to know or to re-develop the life lived by some savage tribe, we follow the perceptions of an average person of that tribe from the moment he rises one morning to the moment he rises on the following day. We are thus enabled accurately to record and then to re-produce his normal habits, while otherwise we are likely to connect and re-member only a few striking or accidental details. (Corrections for seasons, special occasions, ages and social strata, will, of course, not be neglected.) Such a rule, applied to the memory, prevents random re-development, which is almost invariably tedious, imperfect, misleading and prejudiced. A second rule
refers to vegetation in general. A plant may be studied or thought of, to begin with and apart from established science,—from roots upward, and from the time it is a seed to the time it decays. A third rule embraces animal life, though here permanent standpoints are to be chosen for classes rather than for the whole animal kingdom. Perhaps, for non-specialists, “from head-to-foot and birth to death” would satisfy every-day curiosity as regards the higher animals, and many of the lower. A fourth rule deals with systems which have a commencement and are not embraced in the previous groups. Thus a book is studied from beginning to end; a road, a concert, the history of a reign, era, country or person, should be treated similarly. The fifth and last rule includes those classes of systems which cannot be brought under any of the above headings. In such cases arbitrary standpoints are chosen. Instead of observing a ball or a circle at random, I fix upon some arbitrary point as the place from which to proceed and to which to return.

These five rules of observation will be found of unmistakable value to those who are yet untrained. Occasions to apply them are so frequent that once we practise the rules, they soon form a fixed household article in our mental flats. They make re-development easy and certain; they prevent and expose prejudiced re-development; and they allow the full bearing of any issue to be judiciously weighed. It is because of the absence of methodical guidance that so many untenable theories block the path of progress.

(4) Simplest Case.—Given that we are objective in method and duly possess a standpoint from which to set out, we must yet see that we begin by observing or re-developing the simplest possible case. We must, according to this rule, avoid plunging in medias res. If I wish, for instance, as a young beginner, to re-develop the method by which vulgar fractions are added, I need not speculate long, nor write down, as it occurs to me, an arbitrary sum, such as $\frac{7}{9} + \frac{2}{3} + \frac{1}{4}$. I choose instead the simplest possible example: $\frac{1}{4} + \frac{3}{4}$. This is a primitive illustration; but the more important or complex the problem, the more imperative is it for us to start with the simplest possible case. In this way a solution will often be reached. In unmethodical re-development, the number of possible cases is incalculable. In intelligent re-development, however, the simplest possible case readily suggests itself to the practised intellect; and one single instance of this kind covers a whole class of facts.

Let us combine these three methods. A boy at school is asked to enumerate the articles of clothing which are worn. Ordinarily he spouts out in fits and starts the name of some article or another. Of many articles he does not think; several he mentions more than once; now he refers to his uncle’s hat, and again to his own stockings. If the child, however, be drilled in the above rules, then instead of casting about he would (2) directly or in imagination observe (4) one particular individual, perhaps his teacher; and (3) examine him from head to foot. Memory would thus be easy and accurate. ‘If he desired to be more liberal in his judgment,
he could successively think of the various children in the room, then of
the teachers, then of the parents, and then of the persons in the street.
In practice it will be found that methodical observation is often preferable
to re-development. The body of the chapter has shown us that to the
eye, in proportion as it is intelligent, the new is contained in the old, the
complex in the simple, and for this reason there is no necessity for storing
up an infinity of detail when the rationale of these details is accessible. A
training which supplies the student with general methods and general facts, is,
therefore, the best aid to memory.

(5) Generalisation.—The simplest case, in connection with systematic
and graduated generalisation will normally prevent superfluous memorising.
Suppose that a man has little to do with vulgar fractions, and that he is
apt to forget how to deal with them. He has an easy remedy. A little
common sense, in combination with the notion of simplicity, will help him
to learn, re-learn or re-develop readily. He knows beforehand that two
halves make a whole, that a half taken from three quarters leaves a quarter,
that half of a half is a quarter, and that one quarter divided by one half
produces a half. Inspection will thus yield or return the secret of manipu-
lation. To make certain of his guesses he only requires to employ a few
samples. One well understood complex problem in algebra may thus
assist us in keeping bright our elementary mathematics, and a few pages of
a book, our French. In this manner a long line of facts which are likely
to be forgotten are readily learnt and re-learnt. Let but the simplest case
be re-collected or found, and organised reaction soon throws a flood of
light on a problem; but the reaction must be organised.

A ready understanding consequently dispenses with much learning, its
place being taken by cautiously directed observation, generalisation and
pertinent re-development. A school boy, for instance, is told how to
multiply a sum of two figures by eleven in some special manner. Instantly
he will try, if he follows our suggestion, whether he cannot in this way
handle more than two figures, and whether multiples of eleven do not obey
the same principle. From this point, if he is enterprising, he proceeds to
find rules for numbers other than eleven, and thence to related subjects.
His graduated method of generalisation deals with varieties, species and
higher orders of facts, and he generally dispenses with deduction. Under
these conditions the memory is little harassed, while it is yet effective.

Once the notion of generalising becomes a trend, it will be applied
everywhere. Every useful suggestion, hint or successful move, will be ex-
tended to the very utmost limits, so that no chance is lost of fully exploit-
ing a situation. In this way most difficulties may be resolved and most
truths follow as easy deductions. It is to be understood that the general-
ising must be systematic and graduated.

(6) Further Rules.—In the pursuit of discovery some further rules
should be applied. When, for instance, a proposition is before us, there
should be not only an attempt to prove it; but also an endeavour to show
that the opposite contention is justifiable (opposite case); that the proposi-
tion does not hold good at all (negative case); that it is true to a certain extent only (rule of degree); and lastly, that it is applicable to other classes as well (rule of variety). (Sec. 7.)

(7) General Forgetfulness.—Many persons have a very indifferent memory for isolated facts; they forget what they have to do. In the case of complicated relationships there are probably but two methods to be pursued. One is to make the relationship adequately concrete. For example, when we know how the two ducal houses (sec. 134) came to their respective colours; by what virtue an acid turns a blue litmus paper red; what are the exact processes which distinguish the exit and entrance of nerve bundles in the spinal cord, and what are the attributes which divide white from grey nerve material, etc., etc., —the difficulties of the memory vanish. The other method is an artificial one, and depends on the attachment of what is abstract to what is concrete. Mnemonic systems, however, promise much and perform little. As far as I know them, and I have examined large numbers, they savour, as a rule, strongly of quackery. With an air of great learning mnemonic system builders mask only the crudest generalisations.

General forgetfulness can be checkmated by method. Have a convenient and permanently assigned place for every fact or thing; whatever you have to do, carry it out on the very first opportunity; engagements, etc., should be entered in a diary; objects which are to be removed must have a prominent and permanent place allotted to them; etc., etc. [In this connection the rule as regards the will (sec. 157) should be studied.]

The Cultivation of the Memory. Good memories are as rare as they are valuable.

* What is, therefore, surprising, is not that a great many books have been written on this subject; but that so little has been accomplished. Those who are well informed (Bam, *Education as a Science*, 1879, p. 121, and James, *Psychology*, 1890, i, p. 663-7) deny that the memory is capable of direct improvement, while others evidently proceed on the opposite assumption. The former position can only be upheld in the sense that the judgment, the imagination, the feelings, are incapable of direct improvement. The memory books have little to offer to the man who will not learn a system. Granville's book already referred to is by far the best of its kind. He proposes that we should read or observe with a view to re-membering, insisting that a man's memory will not benefit much when he reads with the notion of understanding alone. For the latter reason, he is not inclined to hold that a well understood passage will be easily re-developed. He holds that men should find out which is for them the easiest method of (1) absorbing, and (2) re-collecting ideas,—by the ear or by the eye,—and follow that. The auditory will thus intently listen, and assume that position in re-development. Owing to individual differences, each man will also build up or select his own mnemonics. Given memory-attention, we are next advised to freshen up continually our knowledge of the immediate and far off past, and duly co-ordinate recent acquirements. This little book, I repeat, stands by itself in useful hints. Franck, in his *L'Art de . . . se Souvenir*, 1888, works out in detail a scheme of memorising, based on daily repetition of digested knowledge the key words of which are entered in a special key-word book. Many works on the subject refer in a bombastic manner to the laws of association; but generally speaking, without drawing any valuable conclusions from these principles. Most memory books contain systems which are intended to enable us to learn lists of names, dates, etc. As the average man has no ambition in this direction, and as strings of facts should not be taught at school,
the value of these ingenious attempts, except for special purposes, becomes doubtful. They consist, for instance, in giving letter values to figures, and combining these into words or sentences. Pick, in this spirit (Memory and its Doctors, 1888) arranges Latin and French grammatical exceptions in an order which allows of a ready transition by sense. Such series are remarkably easy to learn; but I do not know whether they are not as easily forgotten. There is still a great need for a few wise rules. Figures are frequently of use, and there is no reason why we should not manufacture these as occasion arises. To a limited degree we may indulge in haphazard methods by which to re-develop untrustable details. For instance, I was anxious to read a book by Garner on the speech of monkeys. Apart from a mnemonic I should have been in danger of confusing the name with Burnett, Garnett, Warner, and so on. By constructing a sentence, this was avoided. “We garner corn; but we do not garner the speech of monkeys.” All these devices, however, have little to do with the cultivation of the memory as a whole.

137.—A BIRD’S EYE VIEW.

In those beings which are most lowly organised, the main trend of activity consists, we may say, in shrinking from danger and in absorbing nutrition. As we rise in the evolutionary scale, however, we meet with complicated reflex action and with definite sensations, also perhaps with changes such as are implied in the phrase “hairy handed son of toil.” A higher stage of evolution, again, will express itself when, in a mechanical manner, the advantageous course is persisted in and followed mechanically, as occasion arises, here, where artificial selection supplements natural selection, there is wide scope. Lastly, through complications in the circumstances under which a species lives, a model or mimic world may become a necessity, and, accordingly, spurred by needs, thus develop weakened and simplified discharges of a more and more complex kind. These form the memory proper, as we usually understand it. In the strict sense, therefore, the world of memory is a stage where we play the drama of life in advance, and for our own purposes. This sketch, however, does not presume to supply the precise how and when of the evolution of memory. It does not even commit us to the widely accepted theory that the weaker discharge is merely different in degree from the normal one, for that would contradict the fact that with visuals, say, only the visual aspect is generally integrated. From the highest point of view, therefore, there is no abyss between the “outer” world and the “inner”, and the same point of view teaches us that the present and the past are only distinguished by position in a series.

Additional References.—Arrêt, Memoire et Imagination, 1895; Benet and Hendi, La Mémorie des Mots, 1894, and La Mémorie des Phrases, 1894; Bohm, Zur Theorie des Gedächtnisses, 1877; Bradley, Some Remarks on Memory and Inference, 1899; Jast, Die Associationsfestigkeit, 1897; Kennedy, On the Experimental Investigation of Memory, 1895; Lasson, Das Gedächtnis, 1894; Lewy, Experimentelle Untersuchungen über das Gedächtnis, 1895; Müller and Schumann, Zur Untersuchung des Gedächtnisses, 1893; Müller and Pflecke, Zur Lehre vom Gedächtnis, 1900; Netch, Über die Gedächtnisentwicklung bei Schulkindern, 1900; Schubert Soldern, Reproduction, Genital und Will, 1887; Smith, On Muscular Memory, 1896; Twardowski, Inhalts- und Gegenstand der Vorstellungen, 1894; Uphues, Wahrnehmung und Empfindung, 1888; and Uphues, Über die Erinnerung, 1889.

* On the systems generally, see Middleton, Memory System, 1881.
CHAPTER VI

SYSTEMS AS DISTURBED

Quakes the neural citadel,
Rush we towards our heaven or hell.

138.—Pleasure and Pain are neither Sensations nor Feelings.

The temperature of the room in which I write is very low. In course of time, consequently, my feet begin to grow cold, though the body generally remains warm. Slowly, like the tide on the sea-shore, the cold, as felt, rises: it licks the ankles; it has crept up to the knees. Nevertheless I continue to write; my thoughts follow their way undisturbed; and I turn my attention freely in what primary or secondary direction I choose. The cold does not destroy or break through my line of thought. It leaves me unaffected. I do not shiver and I feel no inconvenience. [Closely examine similar cases, employing experiment by preference. Extend the examination to temperatures generally.]

Here we have a high degree of cold, as felt, conjoined with an absence of pain. The truth of this statement is indisputable. I am convinced that the feeling is the one rightly dommated "icy cold," and, at the same time, I am equally certain that the feeling leaves me wholly unconcerned. As I am unmoved by the inkstand and paper before me; as the membering of these gives rise to no uneasiness; and as they indifferently occupy the field of vision when the eye lights on them occasionally: so the icy extremities appeal to me only in a casual way. I might as truthfully assert that I suffer excruciating agony, as that the cold pains me. What is more, I have no justification for calling the feeling painful rather than pleasant.

* The physiological point of view is so suitable to the treatment of the subject of pleasure and pain, that I have not hesitated to adopt it in this chapter. The immediate result of feelings are too indecisive and obscure to repay systematic treatment. If, however, the student is sufficiently imaginative, he may think of the feelings as commensurate with the body, that is to say, given a body as touched and that same body as seen, he may picture to himself that body as felt—a body consisting of feelings, and corresponding closely to the seen and touched body, or, at all events, corresponding to the nervous system. In that case the disturbances—the pleasure and pain—may be imaginatively traced in the realm of feeling. Nevertheless, even then it would be convenient to examine the problem of pleasure-pain, as it is clearly given to sight and touch rather than as it is obscurely given to the feelings.
S Y S T E M S A S D I S T U R B E D

Is it, then, immaterial, from the standpoint of pleasure-pain, whether we are icy cold or not? We are bound to answer in the affirmative; for that state of cold is consistent with a condition of indifference, as regards pleasure-pain. We cannot reasonably urge that a feeling as such is connected with likes and dislikes, while we occasionally observe it in the absence of any appreciable inclination or disinclination. We must pronounce the feeling to belong to no sect or party; we must seek the explanation of our attitude, when we are pleased or displeased, in something which accompanies the feelings rather than in the feelings themselves; and we are bound to consider the common belief that certain sensations are painful in themselves as based on a confused analysis. We are not entitled to hold that because normally the feeling of cold is noticed in conjunction with other systems and is very prominent, it is, therefore, of such and such a nature or determines this course of action or that. Our examination shows that the inner meaning of what happens has probably been mistaken.

The feeling of cold on a particular occasion, as we have seen, was not connected with pain. We were bound to conclude provisionally from this that felt cold generally is not synonymous with suffering. If that, however, be so, we must go farther. Heat, by the same tentative reasoning, cannot be regarded as pleasurable or painful in itself, nor can developments of any kind be considered as possessing pleasure-pain value by themselves. Must we, then, assert that pleasure and pain, whatever else they may be, are neither sensations nor feelings? There seems no alternative. Shall we confess that the prick of a pin or a well-aimed blow do not induce feelings which are necessarily painful, i.e., that the feelings induced are not the pain? There is no escape from such a position. The sequel will offer what I deem ample corroboration of the above contention.

Let us approach the problem from another standpoint. A certain sweetmeat is placed on the table. I, yet a child, enjoy it immensely, and so do my young companions. We say that the dish is delicious. We are frequently regaled with it. Time passes; but the sweetmeat is still constantly placed before us, until we are all heartily tired of it. We loathe the sight of it and hate the thought of it. The sweet morsel has not suffered a change; it is we that have. The flavour which we thought delectable is still there as it always was. [Is it?] What once we loved, we hate now.

Here we arrive at our former conclusion by a second road. Not only may a feeling which is regarded as pleasurable or painful become indifferent; it may even change into its opposite. We cannot, therefore, legitimately state that systems are painful or pain-causing, if by pain is meant a feeling. It is possible that in the imperfect state of our modes of expression we cannot help, on varying occasions, calling one and the same system pleasurable, painful and indifferent; but this inability only hides, without affecting the underlying unity.

It may be urged: "We grant that the dish retains its chief characteristics. [Does it?] Yet it is not the same thing, e.g., the pastry sticks to the roof of the mouth. In short, a series of new systems are the source of our dis-
like, and it is these which are distasteful." No doubt some physiological change has taken place, and new sensations have supervened in part; but these very systems are to be explained by the same principles. They, too, as we shall learn, can be thought of as pleasant, painful or indifferent. For this reason, however, we shelve the series of immediately given systems, we find that they do not express pleasure-pain. [Experiment with tastes, smells, sounds, sights, pressures, etc. Drink or eat what is harmless but not to your taste, say, cod liver oil or olives, and see whether and how you come to like it or to dislike it.]

I take now a normal occasion when I feel cold. That condition is clearly objectionable. What are the features, then, which mark this case, as distinguished from the one we first analysed? They are generally as follows. I cannot keep closely to my writing. The thoughts degenerate and grow thinner. I recur repeatedly to the feelings of cold. I am uneasy. Perhaps I shiver, breathe hard, and am restless, if the low temperature affects me very much; perhaps catarrh is induced; perhaps the muscles tend to become stiff and the skin insensible. The telling factor in this case is a central nervous disturbance. When that is present, pleasure or pain is noticed. But for that disturbance, there would be no uneasiness, and in the absence of such uneasiness the other symptoms we have enumerated would be indifferent. It is, then, because the cold was, in my first illustration, only local and left the centres unaffected that I was free from trouble. Had, on the contrary, the centres been chilled, its effect would normally have been a neural disturbance, accompanied by a temporary disorganisation of thought and motion. In proportion as such a dynamic result is achieved, we are pained or pleased, and we interpret accordingly the feelings whatever their quality. The cold, as it is, and the disturbance are separate effects of the objective cold on our organism. We shall verify this later on. [Experiment carefully along the line here followed. A whole class room may go through appropriate exercises, each student writing an exhaustive account of what he undergoes. Test, confirm or refute, if possible, the reasoning in the text.]

Psychologists frequently distinguish between a sensation and its feeling tone. According to this view, every sensation is accompanied by a feeling of pleasure or pain; but such an opinion, as we shall see, is untenable. The distinction is also sometimes made between localised pain sensations and comfort or discomfort. Thus it would be said that a sensation of cold can give rise to discomfort; but that it is not a pain sensation. The discomfort here produced is the disagreeable feeling tone which is said to accompany every sensation. Roughly speaking, this distinction between directly and indirectly produced pain is a useful one. Sharply running a needle into the flesh [do this also very slowly and observe result], we feel pained directly; being very cold, we feel pained indirectly. On examination, nevertheless, we shall be compelled to admit that pain sensations cannot be readily classified together or differentiated from other sensations, and that all pain is more or less indirect.

I have spoken as if the difference between a feeling and a sensation were merely one of degree. (Sec. 20.) This, however, is not generally admitted. According to Ward, Sully, and many other psychologists, a sensation is something which the individual attends to, something which is cognitive in character, a feeling, again, only exists in being felt; it represents a state of the subject; it is only known through its effects; and is of necessity unanalysable because subjective in character. Fortunately, the manner in which the
contention is urged, makes its refutation easy, since feeling is considered as strictly one with pleasure. Pun, as I shall show, readily analysable into certain sequences, the threatening sound broken on which the non-subjective theory is to founder, proves but a mirage. Yet even setting our solution aside, it is difficult to find a justification for the subjective theory. Apart from indirect interpretations and particular ways of looking at things, psychology only reveals to us systems in various combinations.

When we say "We are aware," "We feel," "We act," we mean by the phrases certain complex and not some mysterious being. Psychologically considered, all thinghood, all action, is a formulation of facts from the point of view of practical necessities, and terms such as desire, house, family, ego, nation, book, agree in this that they express, technically speaking, complexes whose meaning changes as do the wave forms in an optolator. Indeed, as Mach (Betrachtungen zur Analyse der Empfindungen, 1886, p. 18) well says: "If we ask who feels, we refer in analytical complex of elements to a yet unanalyzed one," that is, to say, to explain the ego, we use another ego, and to explain that tell on the I. For these reasons I intend to ignore the existence of selves when fundamental terms are concerned, and hence the facts imputed in awareness, action or feeling, must be explained on a non-subjective basis. To do otherwise, is to make psychology a matter of sense, and not a matter of sense, is to disturb the psychology of rumour and prejudice by professional garb.

Sully, in the second volume of his Humen Moll, insists on the distinction between feeling and presentation. Whether I view this distinction positively or negatively, I obtain the same result. To begin with, men speak of the feeling of desire, of the feeling of excitement, of the feeling of fear, of the feeling of cold. If the definition of feeling, which I have given, and which agrees with the popular use of the word, is accepted, we have in them all the above instances of the simplest characters to which we attach the name of feelings, and the absence of these elementary sensations is the absence of feelings. In our case the word feeling is a useful word, and one is appropriate. Let me use Sully's definition of feeling. He states, in the first volume of his "The Facts," "We define them as the intellectual structures of our experience. That subjective side excludes what we style primary and secondary sense, all the changes within these, and refers me to the indefinable experience. Hence, the side of this, by speaking, must be empty. The statement of this, in my opinion, is as follows: to state the feeling, duration, and probability of all the feeling is just as well as any distinction between pleasure and pain. For Sully's theory, the only objection to this is that the subjectivity of the phenomenon is not that of the phenomena themselves; but the answer is that the subjective character of the phenomena is no violence to the facts but it may work havoc among those which are found within the "essences" and "substances," bequeathed to us from the Middle Ages. For these reasons Sully's distinction between feeling and presentation seems to me invalid.

I will here collect the opinions of psychologists on the chief problem discussed in this chapter. Allen, Physiological Ethics, 1877, "I feel, not as long as it is pleasurable, or in so far as it is useful, or pleasant, or consolatory, as long as it is harmful, or diverting, or destructive one" (p. 26). Ams, "Pun is the subjective concomitant of destructive action, or insufficient nutrition in the sentient tissue. Pleasure is the subjective concomitant of the normal amount of function in the sentient tissue." (p. 29). Bain, The Emotions and the Will, 1875, "Feeling compresses all our pleasures and pains, together with states that are indifferent as regards pleasure and pain and are characterised simply as excitement." (p. 1). "The most palpable distinction among our feelings is the contrast of pleasure and pain" (p. 10). "In every volition, rightly so named, the stimulus, or incident, is some feeling." (p. 14). Bees, Les Sensations Intérieures, 1889. "If pain exists to make us feel pleasure by contrast, it would have been better if

* The question touched upon here is nicely discussed in ch. 8.
† See also "On Feeling as Indifference," 1879, 7, by Bain, Johnson, Mason and Sully.
we had run into a sort of both, it would have been better to pass some time influence than these fluctuations between pleasure and pain that in this place where pain always resists to itself the larger and better part of life. (pp. 221-2)

“Hilum and pain are...the fundamental and primordial elements, in the terms of the drama” (p. 252) See also on the expression of pleasure and pain, pp. 193, 201, on the laws of resistance to pain, pp. 190, on intense pain, 169 et seq., on stimulus pain, pp. 202-17, on the utility of pain, pp. 221-2; on subjective pain, pp. 56, 56 Boulanci, *Les Phenom. et de l’Ecriture*, 1965

Pleasure and pain together form an intensity and duration (p. 124) “Pleasure and pain are necessarily in this the exercise of activity. [Hence] the soul does not for an instant cease to express pleasure or pain” (p. 82) “The one [pain or pleasure] being given, we must fill the other of necessity (p. 152) See also on bodily and mental pleasure, pp. 114-134.

And, on the continuous presence of pleasure or pain, pp. 92-93.

*I. O. S. for the 1st \\

There is pleasure every total intensity of forces which constitute the self in mortal, provided that it is not so considerable that it leaves its decisive movement of the senses. There is pain, on the contrary, when its intensity is diminished” (p. 67) See on the state of indifference, pp. 90-101. See, in helm von Horn, 1857, p. 64.

The sensation of pleasure has less existence than that of pain. The sensation of pleasant is a sensation of powerlessness of self, I state, in part, 4, 1899. When excessive pressure is exerted on the skin, or when the temperature is exerted on the skin, the sensation which is excited is called the sensation of temperature and takes on character of one when we then call it sensation of pain (§ 882).

“We may conceive then that it is as common in common sensibilities, and that when this is excited, it is directly to the sensation, we call it pain (§ 82) Hamilton, *The sense of sight*, 1871.

He class which comprehended the phenomenon of feeling (n, p. 414) “Pleasure is a reflex of the spontaneous will and an impelled exertion of power, of which come is necessary.”

Furst, *Over the Overstressed*, p. 440. “All pleasure is from the free play of our faculties and instinct of all from their compulsory actions or compulsory activities (n, p. 477) Hill, *On the Psychology of Pain*, 1851, p. 222.

“First mark, by which we test the true nature of a feeling, is its pleasure or painfulness.” Horace, *P. 3. 7. 1. 64.

“Pleasure is the direct expression of the soul’s impetus for self-satisfaction, that which harmonizes with the conditions of being. It is agreeable, in the sense that it is conducive in being discrepant (1872, i, p. 169) “No sensation with it is pleasure, no sensation without it is sensation is feeling” (1872, i, p. 153) “Accuteness to our view feeling is the mind which primitive and most elementary I am, it is the primary and sole content of conscious awareness and the impelling force to all mental development” (1875, n, p. 178).

Horace also maintains that all sensations are *objective or knowledge-giving, as well as subjective or* pleasure pain *giving* (n, p. 343), and that the habitual or repetition pleasure pain is transformed into sensation and thought (n, pp. 367-8). See also his third volume, *II, Ichtheus*.

*Ichtheus*, 1896, p. 375 “Pleasure and pain are the most general and fundamental qualities of feeling.” Ladd, *Philology*, 1894.

“Pleasures and pains are alike in this that they are forms of feeling” (p. 164) “Ideal pains and pleasures are not comparable in mere intensity with sensuous pains and pleasures.” (pp. 199)

“Pleasure and pleasure pain “Psychology cannot find that the facts testify to this side of life as being by any means all powerful” (p. 197) see also on feelings distinguished qualitatively, ch 9, *Lippa, Grundtatsachen*.

“Unsatisfied striving is...pain” (p. 439), and “Pleasure is the result of psychical tumult, pain a reflex of psychical opposition” (p. 696). Monti, *Physiologie du plaisir*, 1886.

Speaking of defining the word pleasure, he remarks that “the definition of an object known to all, the specific reality of which is unchallenged, is a simple scholastic luxury” (p. 1) “Pleasure is a sensation” (p. 1).
"Pleasure is the mode of a sensation, never the sensation itself." (p. 370). Compare these last two statements. *Physiologie de la Douleur*, 1888: "Pain is a change in sensibility which repels him who experiences it" (p. 5). In dwelling on the possible uselessness of pain, he says: "My servant calls me to dinner every day at six o'clock without her finding it necessary to give me a box on the ear or a thrust with a dagger" (pp. 12-3). See also on expression in pain, pp. 207-317. Marshall, *Pain; Pleasure, and Aesthetics*, 1894: "The subject-matter of our discussion is fortunately perfectly clear. All know what we mean when we speak of pleasure and of pain" (p. 6). This kind of assumption almost paralyses psychological progress. "Pleasure-pain modes are guiles of all mental states: qualities, one of which must, and any of which may, belong to any element of consciousness" (p. 45). "Pleasure-pain... is not sensation, and yet is closely bound up with sensation; it is not emotion, but is closely bound up with emotion also" (p. 35). "Pleasure is experienced whenever the physical activity coincident with the psychic state to which the pleasure is attached involves the use of surplus stored force. Pain is experienced whenever the physical action which determines the content is so related to the supply of nutriment to its organ, that the energy involved in its reaction to the stimulus is less in amount than the energy which the stimulus habitually calls forth" (p. 171). Marshall holds that probably direct nerve stimulation is only followed by pain, because of the crude methods which have to be employed (p. 17); and that the frequent fact of pain following sensations is an illusion (p. 18). Mezes, *Pleasure-Pain Defined*, 1895, p. 42: "The prominent idea, the idea attended to, in a whole of mutually congruent elements, is called pleasant... Attention plus inhibition is the mark of pain, attention without inhibition that of pleasure." James Mill, *Analysis*, 1859, ii, p. 184: "I have one sensation, and then another, and then another. The first is of such a kind that I care not whether it is long or short; the second is of such a kind, that I would put an end to it instantly if I could; the third is of such a kind, that I like it prolonged... I call the first indifferent; the second painful; the third pleasantable." Morgan, *Comparative Psychology*, 1894, pp. 138-9: "It seems proved that the nerve-endings which are stimulated to pain are different from, and probably lie deeper than, those which are concerned in sensations of touch or of temperature; the nerves with which they are connected pursue a somewhat different course in the spinal cord, and end in different centres in the brain." The position which Morgan accepts has been severely criticised by Marshall and others, and must be received with due caution. Nahlowsky, *Das Gefühlsleben*, 1862: "According to our opinion there exists physical as well as mental pain. The former is a sensation (Empfindung), and only the latter represents feeling (Gefühl)" (p. 16). "Feeling andvolition do not exist outside of or along with ideas; but result from these latter" (p. 42). If we hold, as we do, that a sensation is based in the past and is a complex reaction, then Nahlowsky's distinction between "sensory tone," implying a bodily disturbance, and "feeling tone," implying a psychic disturbance (p. 17), is far from evident. Nahlowsky's definition of an idea—he is a Herbartian—is equally untenable in my view. With others he also holds that, normally, mental process is only inappreciably disturbed (p. 47). Ribot (The Psychology of the Emotions, 1897) expresses himself thus: "The affective life is appetite or its contrary—that is to say, movement or arrest of movement; at its root is an impulse, a tendency, an act in the nascent or complete state, independent of intelligence, which has nothing to do with it and may not even be present" (p. 438). "Let us define 'pleasure' as an internal state which every one knows by experience, and of which consciousness reveals innumerable modes, but which by its generality and its multiplicity of aspect escapes definition" (p. 28). Robertson, *Psychology*, 1896, p. 191: "Take a needle and bring it gently into contact with the skin. Of what are we conscious? We are intellecitive; we say it is something sharp; we perceive it for what it is. But suppose the needle is run in. Our consciousness assumes the aspect of feeling; we are pained." Spencer, *Psychology*, 1880: "Pains are the correlatives of actions injurious to the organism, while pleasures are the correlatives of actions conducive to its welfare" (p. 279). Again, "Physiologically considered, a disagreeable course of action is one in
which compound feelings have to issue in compound actions, through complex nervous structures which offer considerable resistance" (p. 579). “While pleasures and pains are partly constituted of those local and conspicuous elements of feeling directly aroused by special stimulation, they are largely, if not mainly, composed of secondary elements of feeling aroused indirectly by diffused stimulation of the nervous system” (i, p. 288). Stanley, *Feeling and Emotion*, 1886, p. 69: “Feeling then, we conclude, is the purely subjective factor in consciousness; and *per se*, both as developed and undeveloped, is merely pleasure and pain.” Stout, *Analytic Psychology*, 1896, ii: “The antithesis between pleasure and pain is coincident with the antithesis between free and impeded progress towards an end” (p. 270). “With ultimate attainment, the mental tendency ceases to operate, and the pleasure ceases also” (p. 271). “The gaining of an end is pleasant” (p. 273). “We simply deny that, in the waking state, our mental attitude is ever wholly without pleasant or painful tones” (p. 288). “Pain-sensations form a class by themselves as truly as do sensations of pressure or of smell” (p. 301). A criticism of Marshall will be found in the same volume on pp. 291-9. The arguments advanced by Dr. Stout do not carry easy conviction. Perhaps the statements which follow are as true. Free progress need not be accompanied by pleasure nor impeded by pain; pleasure does not cease with attainment; the gaining of an end need not be pleasant; and experiment is frequently unable to discover pleasant or painful tones. Stricker, *Das Bewusstsein*, 1879, p. 72: “That which appears to me neither indifferent nor unpleasant, can only be pleasant.” Sully, *Human Mind*, 1892, ii: “Feeling consists of all varieties of pleasurable and painful consciousness” (p. 3). “A pleasure is any degree of agreeable consciousness which as such contents us, and is voluntarily held to; a pain any degree of disagreeable consciousness which as such contents us, and is voluntarily repelled” (p. 3). “We appear justified then in saying that feeling proper is nothing but the various shades of the agreeable and the disagreeable, apart and in their comminglings” (pp. 4-5). “Feeling is the subjective side of our experience” (p. 12).

139.—The Nature of the Nervous System determines how far we are Drawn towards, or Recoil from, an Object.

- For experimental purposes I have turned acrobat. - I support myself on my toes, and, to assist my balance, I stretch out my two arms. For a few seconds I stand as firm as a rock; but as the moments pass, I have to make increasing efforts to preserve or regain my position. At last, in spite of vigilance, resolve and effort, my centre of gravity is displaced. Furthermore, after a while the motor series claims only part of my attention, since with it there has developed a sensory series. No unusual feelings were at first traceable; but, as they persist, distinct feelings are evolved one by one. They attack in succession the feet, the ankles and the knees. In the same way a stream of sensibility beats against the arms, and spreads over the shoulders and the chest. All this not only makes itself felt where nothing special has been previously observed; but as time goes on the feelings increase in complexity.

Was it a feeling of pleasure or pain which upset my balance? Did I will to fall? No. At least, disregarding the second question as not appertaining to our present problem, what happened revealed not a streak of either pleasure or pain. My aim was to learn how long I could support myself in the unsteady posture mentioned, while there was no motive inducing me to desist from my task.

(1) The reason for the failure lay in the structure of the organism; for
the nervous system can only maintain its stability under conditions differing from those under which my experiment was conducted. It is able to resist a certain amount of strain without flinching; but disorganisation gradually supervenes until the nervous system breaks down at last. Our desires have nothing to do with this course. Were the nervous system differently constructed, my experiment would have ended otherwise. If I chose to stand on the very tip of my toes, vigilance, resolve, effort, all alike, would lack scope for action. Collapse would be unavoidable and almost instantaneous.

We here face a force which has to be reckoned with. We meet with modifying agencies besides those of desire, and we are compelled to assume that the relative tone of the bodily constitution enters into the problem. When we are tired, it is not because we like being tired, but because of our nervous structure; when we continue working in spite of being tired, it is again by virtue of the functional tendencies or needs of the organism. Sometimes our resolve has no effect whatever; sometimes but a momentary one; and sometimes we persist with great difficulty. Were our organism structurally different, and structure differs with different animals, our resolves might be either arbitrary dictators, or slaves who can call nothing their own. We might conceivably be so wise that we should marvel at the limited range of Aristotle's outlook, or so dull that an oyster would object to our unintellectual company. What we desire, both as to magnitude or quality, is decided by our functional tendencies and capacities. Organised reaction takes care of that. It is a sure sign of insanity when a man attempts to act with a cool disregard of his constitution.

The following are some of the facts which explain why no allowance has, as a rule, been made for the limitations which are here insisted upon.

(a) Capacity varies with individuals, and from this men have concluded that the ability itself is created by desire.

(b) By means of special efforts we can generally re-distribute the available energy more or less. People, therefore, reason that if we only will strongly enough, no enterprise will be too arduous. In the physical world the narrow limits of exceptional effort are fairly evident, and for this reason it verges on the absurd to imagine an average youth, by dint of sheer determination, uprooting oak trees. Not so, however, in the realm of thought: here all is confusion; nothing is too extravagant for belief; and desire is supposed to be omnipotent. If we were only pleased with the right, some men argue, no mean thought would ever suggest itself, no thread of reasoning would ever be broken, no opportunity would ever be neglected. The palpable falsehood of the doctrine is evident to the unprejudiced observer. Human history gives it the lie direct. Yet owing to the absence of a searching inquiry, the naked doctrine, riddled by facts, still maintains itself. Our studies, however, have taught us that extra effort is equally limited in the two realms—the primary and the secondary, and that such extra effort is determined by the nature of the human structure. If the energy of the organism spent itself entirely in disjointed
efforts, and if every action were as incapable of being prolonged as is the action of standing on tiptoe, then we should never demand, speak of or think of extra exertion. The capacity for such, as for all, effort is a capacity of the organism.

(c) The third and last reason why mistaken notions prevail concerning the command of desires over the body, is one familiar to us from the third chapter. Appropriate exercise strengthens. Hence we are able to gain greater power if we strenuously persist, which is but repeating the maxim we have just laid down, i.e., that appropriate exercise strengthens. This capacity can be developed to some extent (by learning what assists; by forgetting what does not assist; by finer judgment; and by muscular and nervous development), and is in itself a given fact. It is this truth which is here referred to. The practical aspect of this tendency to grow has been fully discussed in ch. 3.

(2) We have seen that a series of special feelings spread and developed as the equilibrium became more difficult to maintain. There were other sensations present, such as those of sight and equilibration, but these will be left unnoticed in this place. The specially evolved feelings had an unmistakable source. They arose in connection with more or less abnormal changes in certain portions of the body, and in their turn they determined nothing. They neither shortened nor lengthened the period of doubt. Had they been entirely absent, I should, other things being equal, have given way neither sooner nor later than I did.

What, then, was their significance? In the particular experimental instance they had none; but otherwise the significance lay in what they were signs of. Let us elucidate this by assuming that they and their physical counterpart did not exist. If, under such conditions, I worked too hard at some problem, I should become more and more exhausted, slowly approaching perhaps the fatal borders of insanity. All the while there would be no warning, and my reason would perhaps give way. Again, imagine that I am on the threshold of solving the problem. Not perceiving this, I probably miss the point. Thus, such feelings inform us usually as to how matters stand, and with this information we can do much, without it little. Must we then assume that a non-bodily fact, pure and simple, has a radical effect on our physical actions? To this one may answer: other things being equal, yes; but this equality does not prevail. The existence of the non-bodily systems indicates the presence of their neural counterpart. It is the latter which completes the physiological equation. Were the feelings absent, as they often are, it would argue that the physical effect of our activity had not appropriately stimulated the brain. That is where the mischief would lie. Let the non-bodily series alone be annihilated, as is often the case when some action continues while we are chiefly engaged in some other direction, and the actual process, we have every reason to believe, unfolds just as if the special non-bodily systems were present (sec. 19). Once more, then, we discover that indirect factors are responsible for the significance of the sensory series. They indicate that
the system is working harmoniously, and that important changes yield their secret to the central regulative portions. [Attempt to distinguish between various feelings, as heat and cold (before a fire on a winter’s day), pain and pleasure, etc.]

These special feelings or sensations have no particular feature which distinguishes them from those of any other class.* The sense of sight, that of equilibration, that of contact, that of hearing, are in the last resort explicable in the same way as the sense systems referred to. In each instance the significance of what happens rests in what it is a sign of, and not in itself. “All is right with the world” as far as there is no disturbance.

The organism abounds with intelligent or complex activities of supreme importance wherein our awareness plays no known part or almost none. The complicated processes of blood-aerating, of digesting, secreting, rejecting and assimilating various substances, or of propelling the blood, pass normally without sensory indications, and were it not for anatomy and physiology, i.e., for indirect research, we should be almost at a loss to know what happens within the body. Many portions of the organism, too, have unstriped muscles, and frequently no nerves. Activity, in a large percentage of the instances mentioned, is unsuspected by us; and many sense systems become only intelligible after anatomists and physiologists have connected them with parts of the body and pointed out their meaning. The brain, being a part of the body, does not volunteer information as to its processes. This we might know deductively; but experiments recorded in previous chapters, especially in ch. 4, confirm the fact. We have learnt that much of our intellectual life is hidden from us, or revealed by vague feelings only. We find once more that the brain acts as does the body as a whole, disclosing few of its secrets, except to the anatomist and physiologist.

We have carried our examination far enough in two directions: we have dealt with the question of extra effort, and with that of feelings connected with such extra effort. Let us now follow a different line.

(3) At first the vigilance and the effort required in balancing myself were almost nil, or, to express the same fact differently, to begin with, the experiment absorbed so little attention that I could attend to it and to other things as well. As I proceeded my bodily energy became absorbed to the point of exhaustion. Considering, however, that I was interested in the attempt, that did not matter; a labourer uses his full strength in this way hundreds of times during a day. We must allow nevertheless for the fact that our lines of activity are marked out, first, by fundamental needs, and secondly, by organised reaction, and that owing to functional tendencies,† we occupy ourselves with normal bodily and intellectual wants, which do

*Physical pains as well as mental pains are localisable more or less accurately. Abstract from them the localisable aspect, that is to say, the sensations, and there remains a primary or a secondary disturbance.

††† Our several organs constitute not merely so many capacities for particular functional activity, but so many tendencies or dispositions towards such activity (Sully, Human Mind, 1892, ii, p. 17).
not include exhausting feats. By routine, for this reason, we ordinarily shrink from effort, and require, therefore, a strong incentive to persist in difficult courses. The slightest effort of an unaccustomed kind, as has been repeatedly explained, tends to be dismissed organically; thought after thought enters the lists, and gives battle to the notion of effort. When, on account of training, our reactions are obedient to a purpose, then a difficult undertaking becomes easy, or perhaps loses the character of a task, and in this case the action has become organised. Normally a violent course of action, being unusual, tends to be displaced by others; and since our fundamental instinct is that of self-equilibration, our life could not be moulded on purely experimental considerations. After a time, as we shall learn in the next chapter, the deeper wants compel us to obedience. We conclude, then, that the balancing requires increasing exertion; that such effort will only be forthcoming in the presence of a strong need, or when we are thoroughly trained; that the task gradually monopolises the field of attention, and that the other thoughts which are crowding in, tend to remove the notion of it from the foreground.

What is meant by motive and interest? [Give descriptions of what happens when you are interested.] They imply that a considerable current of attention is pressing in a certain direction. The stream of attention flows easily because previous activity has removed obstacles; or it does so because the trend of thought has the power to produce such an effect through appeal to some deep instinct or to some acquired passion or inclination. When a notion leaves us unconcerned, it is conclusive that the general distribution of attention has not been affected. Here, other thoughts co-exist with, and eventually crowd out, the notion. In interest there is a quick gathering of the current; for example, what one man cannot accomplish without sensible exertion, another does without being aware of any seeming strain. Special effort, voluntary or routine, represents another aspect of this fact. Here also there is a focusing of energy, only normally more slowly evolved. An urgent need, again, is something which induces an effort where custom and established interest are absent. The warmth of interest, the feelings accompanying effort, indicate this rush in one direction. It is as if at one moment various groups of persons stood around sundry platforms at an open-air demonstration. Suddenly something startling happens at one of the platforms, and everybody hastens to the spot. The number of people present is still the same; only they have ceased to be distributed—they are massed. So in special effort, motivated or organised, the attention is collected. If this were impossible, close attention would be out of the question. The capacity for massing and keeping massed is the capacity for keen attention, and were we able to attend freely, the fascination of interest and the influence of a need would be unknown.*

It is difficult to trace the precise antecedent of a disturbance. We might say that in both pleasure and pain something violent happens which compels hasty central readjustment. In pain there exists a violent change with a destructive tendency—a poisoning or starving of the blood or what not,—against which a struggle is initiated in the regulative brain centres. In pleasure we have also a violent change, but with a healthful tendency—a purifying or nourishing of the blood or what not,—and here the central reactions serve only the purpose of hemming in the force, and consequently there is no tendency to total inhibition. From this it follows that in normal action pleasure and pain may be out of the question, and that their place is there taken by inherited or acquired needs. Seemingly

* Stumpf (Toppsychologie, 1883, i, p. 68) identifies interest with attention; and Stout (Analytic Psychology, 1896, i, p. 225) holds a similar view, stating that "interest, as actually felt at any moment, is nothing but attention itself, considered in its hedonic aspect." Fundamentally, the words Need and Interest are convertible terms.
exceptions, such as tickling, will be found to present special features. Thus in tickling there is a kind of convulsive reaction with few destructive effects, and when this is produced playfully, there is a tendency to maintain the condition. [Make a careful study of tickling.] Again, sometimes the fog makes one's eyes smart, and then we observe that there is no apparent tendency to shrink; indeed, movement of the eyelids makes matters worse, for in such a case the smarting interferes persistently with continuous thought or action, and thus induces indirect shrinking, the pain being an indirect result.

It will be found that what is said in this section is specially worth the attention of the teacher of youth. One child will readily take to music, cheerfully spending several hours a day in practice, while another will, under similar circumstances, scarcely make an attempt. The difference between the two children will generally be one of aptitude. The first child craves for music and is fascinated by it, because he is so constituted; the second is indifferent to music and is unaffected by it, for a similar reason. In neither case has pleasure-pain or ethics much to do with the course chosen. Similarly, a boy's progress will seem hopeless because he appears attracted by everything except his work, while his neighbour is remarkably attentive. Here, too, the difference is often entirely a question of capacity. Thus a child will be sometimes indifferent, or the contrary, to education, to good manners, or to moral or other influences, and in none of the instances need pleasure-pain be a decisive factor. What is true of children is, of course, true generally. Wherever natural or acquired aptitudes exist,—and every man and woman bristles with them,—there action is readily initiated and continued, not because it is pleasurable, but because there is a tendency in that direction. Consider the case of a child who does not care for school. With him the notion of schooling awakens no response; the word appears to no need. When, consequently, he has a book before him, his thoughts wander because he is incapable of grasping what is before him. He is thus organically uninterested in all that appertains to disciplined knowledge. If we take the case of a child eager for schooling, we frequently find essentially the opposite; he is readily and organically absorbed in making intellectual progress. Thus ability and inability, congenital or developed, often determine what we shall do or leave undone. The accompanying pleasure-pain is in such instances without effect on the course of action pursued.

140—Definition of Pleasure-Pain.

The following is our definition of pleasure and pain: Where there exists a neural disturbance (ending in an attempt to check or detain a group of systems*), there we meet with pain—opposed disturbances, and pleasure—semi-opposed disturbances.

To illustrate. A speck of dust has found a resting place on the surface of my eye. Being in an experimental mood, I determine to act as a bystander, and I do nothing to remove the intruder. I let nature run her course. The eyelids open and shut faster and faster; tears rush abundantly down my cheeks, and my sight becomes dimmed. The motion of the lids is accompanied by special feelings similar to those described in sec. 138. My walk has a tendency to become unsteady, and as I reach home I feel more than once that I am likely to fall at full length forwards or backwards, owing no doubt to the sense of equilibrium being affected. To escape a catastrophe, as I am now thoroughly weakened, I lie down on a couch. My head is attacked and is becoming worse and worse. Observation of what is going on is difficult. It has ceased. I am now engaged in

* I have added these words in parentheses, so as to exclude pathological cases and others where there is simple giving way or adaptation without any uneasiness.
drying my tears, and in an endeavour to rid myself of the speck. The arrest of observation cases the strain.

So long as I was engaged in noting what happened, I could not be said to have been subject to pain or pleasure. As well might the visual system implied in seeing a brick be regarded as appreciably pleasurable or painful. For scientific purposes I would as readily look at, or look away from, a thousand bricks as one, and in like manner I am always ready to observe a variety of miscellaneous objects,—pins, paper, books, etc. It may be granted, for argument’s sake, that in cool observation there is present a microscopic quantity of pleasure or pain; but all I wish to urge here is that what I observed did not disturb me. The various sensations did not in the slightest degree ruffle my temper, nor can I honestly assert that they could be classed as either pleasurable or painful. I neither wished them to remain nor wished them to go. I was only watching their development, as an astronomer might follow the evolution of an eclipse.

The whole train of events, until observation became discontinuous, was unrelated to pleasure-pain considerations, and the chain of sensations and feelings indicated only how the speck of dust had irritated various portions of the nervous system. Without wishing or choosing to do anything, I broke down, to the point of having my thoughts scattered. The general loss of muscular and nervous tone and the headache had the same source, and I had to relinquish observation in spite of my wish to see it prolonged.

We gather from this account, in agreement with sec. 139, that feelings exist which, according to circumstances, are described as pleasurable, painful or indifferent. They are perhaps marked in character, and yet have no pleasure-pain aspect. A series of events can thus take place in the absence of any pain or fear of pain, or pleasure or desire for pleasure. The motive or the reason for the particular acts as they one by one arose or followed each other, was not a yearning for happiness or a shrinking from evil to come; it lay rather in the acquired or inherited needs of the organism. The events co-existed with, or succeeded each other, without any desire or dread prevailing.

It is certain that acts where the highest centres remain undisturbed form a part of reality. From that alone one may deduce the probable inaccuracy of the view which asserts that whatever we do is the outcome of either a yearning or a shrinking. This carries us a step farther and entitles us to say that if I had acted as usual, and my desires and dreads had mingled with these events, then some portion at least of what happened would not have been the result of likes or dislikes. It cannot be contended that what occurred in the abnormal experiment does not justify the conclusion that similar things take place in the normal state, for that is contradicted by common observation. A part, then, of our activity is not connected with pleasure-pain, but due to organic needs; what about the remaining portion? One must reply that that portion also is governed by organic needs whose aim is to restore the disturbed equilibrium.
Observation was easy at first, and for a considerable period beyond. When it broke down, a fresh series of events was noticeable. Evidently the nervous system was becoming unstable over a larger and larger area. The last fort to be attacked was the neural citadel, and it was then that observation finally ceased. This conclusion is one of great importance. Pleasure and pain certainly appear to be connected with the instability of the innermost nervous centre. When that centre is intact, there is no disturbance, and feelings then determine neither smiles nor frowns. When the centre, however, is disturbed, we are swayed to and fro. Hence attention flows along smoothly and continuously when the nervous centres are stable; while when the stream is violently and capriciously interfered with, we speak of pleasure-pain. In the latter case we are not masters of ourselves, for the nervous centre is in some way disarranged. Pleasure-pain is, therefore, present in proportion as such disturbance exists, and the absence of the disturbance accounts for the absence of the pleasure-pain in the first stage of the occurrence we are examining. As soon as inhibition of a threatening disturbance becomes a task, however small, so soon pleasure-pain begins.

The disturbance followed without being desired; then I occupied myself with alleviating measures; and at last I obtained relief. This is instructive, and an important conclusion may be drawn from it. When such an accident happens, the offending speck engenders one class of need-determined effects, while another class of need-determined effects usually succeeds as a reaction, the object of the second class of effects being to nullify the first. Instead of the irritation being stored and finally leading to headache and prostration, a counter-movement is initiated and the irritation is allayed. * As only certain centres are specially affected, movement has to be of an opposite kind, since not every effort will bring relief, and hence also the attention is employed in removing the cause of neural discord. These counter-movements claim the attention, and energy can, therefore, only discharge itself readily into that channel. Ordinarily, by these two methods, peace is restored to the nervous system. They are nature's means of securing sanity. Our anxiety, our fears, our screams, are accompaniments or expressions of a normal nervous process, the form of which is socially and hereditarily determined. The presence of an offence gives rise to excitement, and that leads to certain movements which allay or remove the excitement.* The feelings and the thoughts, if we provisionally separate movement from feeling (sec. 174), acquire their significance from the physical violence they symbolise. We do not shrink from this course of action or from that because of certain feelings. The normal shrinking is accounted for by the peculiar structure of the nervous tissue, and the feelings by themselves, therefore, lack rationality. We might as well contend that the rising

* Most of the writers referred to at the end of sec. 136 deal with the expression of the emotions and, by implication, with the expression of pleasure and pain. See specially Darwin, *Expression of the Emotions in Man and Animals*, 1872, who treats of the larger outlines involved in the subject.
and the falling of the barometer compels the surrounding atmosphere to contract and expand. Once more we see an apparently anomalous process explained by reference to obvious organic facts. Why otherwise should we shrink from, or gravitate towards, anything whatsoever? On the organic theory what happens explains itself, and no other conception seems to satisfy the known facts. [Try and ignore neural disturbances]

The range within which pleasure-pain acts must be further narrowed. Suppose I have reached the condition where unstrained observation becomes very nearly impossible. I then decide deliberately to restore the state of indifference. With the utmost calm I employ means after means until the results of the spell in my eye are nullified. My attitude is the same as when I am turning over the leaves of a book or when I brush my hat. I am entirely unmoved, and I remain so during the whole of the process. Under the circumstances, the disturbance being inhibited throughout and allayed deliberately, no pain develops. Only in so far as there is an unregulated striving can we speak of pleasure and pain. Only so far as the disturbance is left to itself, and is not interfered with, is there pleasure-pain.

The way in which we regard what is taking place is also important. [What is your point of view?] During the first portion of the accident I quietly observed; during the second portion I calmly took measures to maintain my neural equilibrium. It was open to me to regard with terror what had occurred, trembling, each time I thought of the accident, taking every possible precaution to prevent its repetition, and dwelling on the matter again and again. If I had been much excited during the loss and recovery of my balance, sensible revulsion would, at least for a time, have been unavoidable; but that did not follow my cool attitude. I, therefore, dismiss the thought of what has passed, and remain indifferent to a second attack. My memory is not impressed by what has happened, and the incident is quickly forgotten. The view, therefore, which we take of what befalls us has important consequences. We may, through appropriate practice, become hysterically timid, shrinking into nothing at the thought even of a trifling accident, and wasting life's golden opportunities in passively combating imaginary evils. Or, if we are wise, we perhaps come to ignore pleasures or pains unless they further ideal ends.*

Between these two points of view there are many intermediate gradations: but all that we are concerned to know is that pleasure and pain imply muscular and thought disturbances, and that these can be either accentuated or inhibited. It must also be understood that with civilized beings pleasure-pain, like all happenings, is interpreted in the light of a comprehensive scheme, and that the primary reason for the neural break-down lies, of course, in the delicate structure of the nervous system.

If ready inhibition and one's point of view can and do change the pleasure-pain value within large limits, then the problems of optimism and

* Hence men trouble little about pains not connected with normal needs, e.g., dream pain, and such pains as are related to delirium, insanity or convulsions.
pessimism must be re-examined. If we have been right so far, it becomes absurd to maintain that the very fact of our preferring existence proves that the sum of life's pleasures has been greater than that of life's disappointments; for this would imply that we somehow kept count of all our pleasure-pains and have now and then struck a balance, whereas we have seen (ch. 5) that the majority of developed systems are dis-integrated, and that the remainder are interpreted in a loose and capricious manner by one's point of view at a particular moment. Indeed, we have learnt that neural disturbances are rare, and that we are influenced generally by our various needs, natural and acquired. A criticism of life, from the pleasure-pain point, irrespective of neural capacities and primary needs, is, therefore, irrelevant. Similarly the question of whether life can be worth living is connected with the fact that one's point of view makes a crucial difference. To one with shaken nerves everything is hateful—the sunshine and the rain, the heat and the cold, familiarity and novelty; but he who is strong-nerved and yet sensitive, finds it difficult not to sympathise with every one of nature's moods. The former attitude is the unnatural one. It results almost entirely from paying attention to the painted face of pleasure. When we have once learnt to be guided by the simple organic needs of our being, the ink bubble of philosophical pessimism bursts. Pleasure and pain must be probed below the coloured surface before we can attribute to them a great life-value. [Examine attempts at relief through movements in cold, heat, pain, pleasure, etc.]

In Sully's *Pessimism*, 1891, will be found a bibliography of the subject of pessimism, and an account of the principal pessimist systems. In view of our conclusion that colourless needs and not pains are the motor forces, Schopenhauer's criticism of life loses its value. Hartmann's *Philoosophy of the Unconscious* has even feebler psychological foundations. The principal works of these two principal pessimists of modern times are Schopenhauer (1860), The World as Will and Idea, trs. 1883-6, and Hartmann, The Philosophy of the Unconscious, trs. 1884. As to extreme forms of pain, see Baenius, Les Sensations Internes, 1889, pp. 170-4; and as to a qualified optimism, see Boullier, Du Plaisir et de la Douleur, 1865, pp. 104-19. The latter would reckon on the credit side of life's balance the pleasures of health, of living, of breathing, of moving and of thinking ([ibid], p. 115).

Beaming eyes, smiles, laughter, tears and buoyancy express and constitute pleasure; and where they are lacking, pleasure is also lacking.* Here the attention tends to dwell on or to recur to the act. Eating a luscious pear I retain the sensations as long as I can: I eat it slowly, so that the taste may last the longer. I think of it while I am eating and when I have finished with it. Yet if I had wished I could have observed myself consuming the pear while unaffected by pleasure. Here, too, the attention would

*There is little outward expression in the radiant contemplative joy of the accepted lover or the successful discoverer. In such cases, I apprehend, the rush of thoughts, the dreamy abandonment, the unusual serenity, the complete absorption, indicate the successful attempt to recover one's equilibrium. On the other hand, marked outward expression may be to a large extent forced or suppressed, suggesting a greater or a lesser disturbance than there is actually present.
have been occupied about the sensations rather than with them, while the disturbance would have been ended. [Test.]

Pleasure-pain is a process which is only explicable in terms of motion or change. Let us again define it. Pleasure-pain exists when a neutral disturbance is present; pleasure, in so far as the tendency to return to the normal or undisturbed state is checked; pain, in so far as such a tendency prevails unchecked. Let us further explain our terms. The type of undisturbed activity is to be found in organised reactions of a simple kind. My pen, for instance, hurrying along the surface of the paper without giving rise to emotions, reflections or convulsions, is an illustration of undisturbed action. So, liveliness, smiles, laughter, shouting, a sparkling eye, eagerness, whether they last for a minute or for hours, are signs of neural disturbance, since their presence has the object of relieving such disturbance.

A neural disturbance is distinguished by an abandonment on the one side, and an attempt, when possible, to counteract the disturbance. This is expressed by direct and indirect endeavours. If we introduce a thorn into the hand, we may proceed to remove it, and when this is done the disturbance is practically checked. If that, however, be impossible, then, under normal circumstances, we fret and become low-spirited. In the former case the object is attained directly, the disturbance being removed; in the latter indirectly, the disturbance being allayed through the fretting. When anything goes wrong, there is an organised aptitude for recovery. Now normal happenings are not disturbing; they are not accompanied by crying or laughing, or by any of the modes which express the presence of an irritant. So also, what was once abnormal may, through constant inhibition, become normal, and lose its pleasure-pain value. A neural disturbance is normally accompanied by special feelings, resembling those which are present when we make a prolonged effort or when a speck of dust irritates the surface of the eye. These, by complication, signify to us the disturbance, and the absence of the disturbance implies the absence of special feelings connected directly with the irritation. In grief, again, the feelings indicate an unsuccessful counter-movement. As long as the occasion for grief remains, we mourn; but let that be removed, and we gradually return to the normal state. In good spirits the tendency to return also exists; only it is for a time resisted. The smile, the buoyancy, the laughter, are all counter-movements; but the rebellion is fed, and does not readily collapse. Nevertheless, pleasure, like pain, tends to give way before the state of indifference.

I trust I have made clear what I mean by a neural disturbance, by pleasure and by pain. We must now consider the meaning of inhibition. [Practice and observe in yourself cases of inhibition: hold a hot egg in your hand.] Walking in a wood on a rainy morning, I slip on the clay soil, and fall with great force on the hands and arms outstretched to save me. The feelings which develop are massive and acute. A flame of pain is enveloping me when I suddenly, for experimental purposes, induce general hardening of the muscles. The pain is now gone, though the feeling
which accompany it remain behind. The tremors, the muscular depression, the anxiety, the despondency, have been banished by the position I have assumed. Except for the special feelings and the comparative rigidity of the muscles I am in a normal condition. The hurt produced a neural disturbance and counter-disturbance, and the feelings were but one expression of what took place. The physical position I assumed did away with the disturbance, and, therefore, with the pain and the connected feelings. Inhibition, therefore, so far as it is not a task, is the intervention of an organic condition which excludes neural disturbances and, by implication, pleasure-pain. Inhibition varies, of course, indefinitely with the occasion, with interest, motive and training, and hence a great effort will sometimes have little or no effect, while an imperceptible effort may be almost omnipotent. Men practise inhibition in so far as they are strong-minded and strong-nerved, and as it is a special case of effort, its application is largely organised.

Binet, L’Inhibition, 1890; Binet, Un Cas d’Inhibition, 1891; Breese, On Inhibition, 1899; Heymans, Über psychische Hemmung, 1899 and 1902; Sully, Human Mind, 1892, ii, pp. 246-8.

Pleasure-pain does not dwell in an irritant, nor in the feelings produced by that irritant, nor in a subjective state; it is constituted by the violent reactions of the neural mechanism. As that reacts, so what happens, regardless of the nature of the feelings at the time, is either pleasurable, painful or indifferent. Hence one man’s pleasure is another man’s pain, though the feelings be alike quantitatively and qualitatively, and consequently, when the reaction is not according to the definition, a course of action is neither pleasant nor painful. The larger proportion of what happens to us, only serves a purpose. Thus sighing brings relief when I am disturbed by the cold, without affecting the feeling of cold; and, on the other hand, sighing makes no difference when there is no disturbance connected with the chilled extremities. [Ferri.] A martyr is stretched on the rack, and yet glories. He feels the torture; but his central nervous system, equal to the task, does not give way, and he plays the part of observer instead of sufferer. We can thus readily imagine an individual whom no torture can move, one namely whose system is able to bear the strain. If the martyr were a weakling, he would yield at once, for a man of indifferent nerves cannot resist an attack. Thus we might think of ourselves as competent to stand the greatest strain, or as incompetent to bear any strain at all. It is this fact also that explains faith cures and stigmata, since these depend on the condition of the nervous structure. On the same grounds we conclude that training is desirable because the nervous system is trainable. For the man of science, therefore, heroism, apart from the nervous structure, is a word signifying nothing. Where there is no neural disturbance, there is no pain. As a consequence, pleasure, and the world’s power, pomp and praise, may be despised by the strong man. We shall meet with other deductions which follow from our definition. These few must suffice in this section.
I must add a further word in explanation of the connection between needs and pleasure-pain. Ordinarily, when dinner-time comes round, I am ready for my meal, though I can scarcely say that I feel hungry. In such a case my action is determined by a need, though there is no pleasure-pain. Take, however, another instance. Some one treads on a very tender corn of mine. It is with the greatest difficulty that I refrain from crying out, and a shudder passes through my whole body. That the particular reactions of crying out and shuddering ease the pain and are advantageous to the organism, is obvious; and hence it follows that natural selection has wisely favoured organisms which promptly and effectively meet certain violent attacks which disturb the body's equilibrium. In other words, among the fundamental needs given with the organism is that of protecting it from swift disaster; while, at the same time, the methods of protection in such cases are also mostly due to heredity. The very uniformity in reaction under pleasure-pain suggests that urgent needs require prompt solutions, and that, therefore, almost everything is left to inherited methods of response. For this very reason, ordinary activity, implying as it does adaptation to varying conditions, is chiefly based on what is acquired, and is free from disturbances. Pleasure-pain, then, argues an exceptional state which has to be met in an exceptional way. As for pleasure, it is evident that exceptionally favourable circumstances should be provided for by exceptional reactions determined congenitally. Both in pleasure and in pain needs determine the course pursued, while the disturbance merely indicates that the organism has received a severe shock.

Naturally enough there are minimal degrees of pleasure-pain. We often feel very slightly pleased or displeased; and not seldom the disturbance is so small that we scarcely know whether to call it pleasurable or painful. In most of these cases the pleasure-pain merely expresses the trend of our needs, while the needs themselves are to all intents and purposes unaffected. That is to say, if a few grains of pleasure-pain were present, the ordinary needs, by producing a certain amount of inhibition, would pursue their course unaltered. What is more, even serious disturbances have frequently little influence. An ignorant or stupid parent is not seldom surprised to find that severe punishment is ineffective, though the child's reprehensible conduct yields him no pleasure worth mentioning. We speak, in such cases, of obstinacy, forgetting that pleasure-pain is throughout an unreliable factor in determining action. The wise parent and the legislator accordingly abandon the primitive methods of punishment, and use all their energies to discover other means of grappling with or forestalling difficulties. Hence the modern theory of punishment as regards children, criminals and lunatics fully bears out my contention that whip and sugar stick are not the normal forces which regulate human life.

To touch on another point. Our attitude tends generally to realise itself, at least to some extent. When for some special reason we think that something distasteful is really not so, we swallow it without feeling any ill effects. On the other hand, if we eat something wholesome, and are then told that it was tainted, we are very likely to have an attack of nausea. Thus we may cough and feel extremely uncomfortable, because of a supposed fish-bone in the throat, which has been in reality removed. So, again, the thought of food makes us feel hungry. These and similar instances illustrate the fact of nervous inhibition and nervous concentration; and are but unusual exemplifications of normal activities. It happens not infrequently that I am a little indisposed. As long as I am unaware of this, my behaviour is almost normal; but let some one remark "How pale you look!" and a sudden collapse follows. The process of acting out our beliefs is well illustrated in childhood. If we only succeed in diverting the young child's attention, it often ceases crying and begins to smile, while adults, interests usurp the place of their aches and pains. Every case of self-control or of terror has the same origin. Physicians have to some degree exploited the effect of implicit faith. They prescribe drugs, courses of diet, changes in environment, which are indifferent in themselves, in the hope that the suggestion of a cure will produce the cure. Indeed, the faith which the physician and the quack inspires is an important factor in medical treatment. It is, however, in hypnotism that a desired point of view is suggested most easily and with the greatest effect, owing to the readiness of the subject to absorb suggestions. In the norma
state, attention to any portion of the organism creates therein nothing more than slight changes; but in the abnormal hypnotic state imaginary poultries act almost like real ones, and fancied wounds show signs of becoming actual. "Mental Science" and faith healing, like Spiritualism, exploit the fact just explained (sec. 232). The "Scientist" who insists that diseases and death do not exist, and who sits, or "communicates," with his subject, only makes the best use of a recognised fact, and for this reason alone does he occasionally bring about cures. Experiment is readily applied to supplement observation. [Think of various parts of the body and of various things pleasant and unpleasant: think of a nice dish, etc.] However, the only fact elicited is that our attitude, for good or ill, tends to actualise itself to a minimal degree. How this happens is a matter which belongs to the department of physiology. Faith is consequently for the psychologist a prosaic process, like all other processes; when properly applied, faith may move mountains; but when brought forward as a universal panacea, it is clearly not to be relied on. Good sanitation, plain living, a sociable temperament, a reasonable quantity of reasonable labour, rest and change—such are the great preventative of illness. The application of "X" rays to surgical cases throws into the shade the virtues of faith healing and "Mental Science."*

On one occasion, as an experiment, I said to a friend that I could tell him in which hand he held a coin. The challenge was accepted, and the two closed hands were placed before me for inspection. I glanced at the two hands, guessed, and was right. This was repeated a number of times with three persons, till they looked at me as if I were in league with spirits. A long time passed, and one day I re-membered the incident. I tried once more with one boy of ten and one of fifteen, and was uniformly successful. They asked me how I did it, and I told them that the hand which held the coin was firmly pressed together, that there were tokens of restlessness in that hand, and that other signs were observable. We then tried again, and I failed almost uniformly because the children ceased to attend to the hand which held the coin.

In experimental psychology it is said that the reaction follows more quickly when we attend to the movement to be made than when we attend to the sign which is to induce the movement. On the above theory this is obvious. When we are ready for a movement, all the parts to be moved are arranged for ready action, i.e., part of the act is already carried out. For instance, a child is approaching me and I prepare to take him by the hand. In this case all that remains to do is to grip the hand. So, almost universally, we do not wait till the last moment to perform an action; but we carry out as much of it as possible before the compelling moment arrives. For this reason, also, since the process is organised, we find it difficult not to attempt to act, when we intently think of acting. Thus far the idea-motor theory is justified.

141.—IRRITANTS.

I put my hand gently into a clump of stinging nettles, and I forthwith note the peculiar feelings resulting therefrom. [Imitate this experiment, and initiate similar ones: tickling, gentle irritation of hair, skin, joints, etc.] There is no pain. I observe the extent, the variety and the changes in the feelings. The attention is divided: on the one hand there are the observed feelings, and, on the other, my reflections on the situation; but as these do not absorb all my energy, the remaining power is employed in taking notes. Further, if we do not scrutinise the feeling, the energy must be spent otherwise, for semi-activity is out of the question. Suppose, therefore, that the feelings persist and that they obtrude themselves upon me. I am then forced to think about them. Assuming that they offer no scope

* See Goddard, The Effects of Mind on Body as evidenced by Faith Cures, 1899.
In many cases nothing is gained by being nervous, the true principle being to discover the best method of ignoring an irritant, and to act accordingly. Some persons are so hyper-sensitive that their whole life is a nest of misery: they shrink from everything; they are afraid of everything. Given right ideals of what we wish to be, we would aim at building up particular classes of organised reaction whose object would be to promote our highest needs. Through interpreting pleasure and pain in terms of sensations, men have hitherto shrunk from much that ought to have been welcomed, welcomed much that ought to have been shrunk from, and been indifferent to what should have engaged their serious attention. It is certain that in the future the position a man takes up will be guided by objective aims rather than by subjective impressions. It will be found that tastes can be accounted for and moulded.

Why did the gosling repeatedly scratch itself with its feet when it had issued from among the nettles? The reason is that dust particles and small bodiers generally are often dislodged by that method. Now the sensory effect of the stinging nettle is a similar one, and, therefore, as explained in sec. 999, we act similarly. The greater the irritation the stronger is the reaction, and the more it resembles another irritation the more like is our reaction. That is to say, our acts are normally determined organically, and if they have their foundations laid in ignorance and superstition, they fail to be appropriate. In this way a person reasons himself into the belief that a cold morning bath and a long walk are good for him; he actually thinks that he is enjoying these, and yet onlookers recognise that his judgment is at fault. So some person believes that he has reached the summit of blessedness when he is really to be pronounced unhappy, while another thinks that the world weighs heavily upon him when he is normally as happy as a bird in Spring. As the customary influences vary, so does our reaction. In organised processes of the obscurer type, when stimulated by needs, we only act; we do not act because a certain object yields pleasure or prevents pain; we proceed thus, because we have proceeded this way before. Indeed, in instances where the origin of the process is not easily traced, we frequently mistake the (supposed) original motive.* We say that we do this or that because we like it or because we dislike something else, when the contrary is often the true explanation. Stimulated in this wise by a belief that every action of ours is performed because of the felt pleasure it involves, we boldly assign felt pleasures to every act, without sufficient evidence to justify such a course. Urged by our philosophy, we imagine the feelings or manufacture them during the analysis.

We learn here how pernicious is the largely prevailing custom of assuming that pleasure-pain states are obvious. It is most difficult to obtain from any person information with regard to his feelings, for he usually replies in accordance with some shallow theory. Casual self-interpretaion is no less fallacious.

* * "It has been cynically observed that people go into society less in order to be happy than to seem so, and one may add that in this semblance of enjoyment they may . . . deceive themselves as well as others" (Sully, Illusions of Introspection, 1881, p. 14).
142.—Organised Reaction largely decides what shall be regarded as Pleasurable or Painful.

I am at the sea-side, and, intending to bathe, I step into the water. I begin to shiver with the cold, and rush out.

The reasons for such conduct may be manifold. The mood of expectancy, we are in, influences us to a considerable extent. We may walk into the water unconcernedly, in which case we obtain somewhat of an indifferent reaction. Probably we shrink a little, but scarcely observe the shrinking. Or we plunge into the water fully determined not to be driven back by its possibly low temperature. In this instance, though the water be cold, we receive and bear the shock with equanimity, if we are strong-nerved. We shall, if we are so inclined, meet pleasure and not pain. Those stimuli which are connected with pleasure are not inhibited from propagating their impulse; while those others whose free sway would mean pain, are restrained. These latter become indifferent; they do not excite to action in any direction; and they have their poison fangs made harmless by central inhibition. In the special case we are considering, expectation has perhaps meant that I was unnerved to start with, and that instead of fortifying myself I threw away my shield. Whatever shock, under such circumstances, the cold waves might communicate would have more than the ordinary effect. We shrink before we actually touch the water, and we are excited when there is nothing to be anxious about. At the commencement our nerves are in a state of extreme excitability and readiness to yield, and consequently a swift collapse follows. Expectation varies within wide limits; and except when we are taken by surprise, it always plays a considerable part. Inhibition or control are thus usually strengthened or weakened in the face of a contingency. Were we to apply an appropriate instrument, the nervous adjustments would show a constant relationship.

For the above reason it is often possible not only to react differently; but to react oppositely. Instead of shrinking from, we might revel in, the cold water. The limits to such variations are of two kinds. First, the application of inhibition soon reaches the maximum extent. Accordingly, when the centre of inhibition is powerful, our conduct may change capriciously; but when it is weak, we have little chance of adapting our reactions. The resisting power of the centre thus ultimately decides within what range our reactions are to vary. Were the capacity absolute, pleasure-pain would never affect us, except at our discretion; were we helpless, life would be intolerable and impossible. Secondly, our attitude towards objects is not a question which is solved at the moment when some course of action becomes desirable or imperative. The general manner of reaction is determined organically (ch. 3). We grow into that manner, and for this reason even our behaviour when we are surprised is not outside the organised circle. Some men will, therefore, come to remain perfectly cool under harassing conditions, while others will lose their
presence of mind when the least occasion for surprise arises. Not one circumstance, but a hundred, will be arbiters of how we are to react. For this reason the method of reaction of the average man is far from uniform, trifles sometimes suggesting differences in his point of view. We need not, therefore, think that environmental factors alone make us react or act as we do; for since our attitude is subject to custom, it is also liable to deliberate training.

Man's relation to pleasure and pain, as we see, is not a fixed one, for the warmth and quality of a feeling are not always connected with one class of conduct. Strictly speaking, they have nothing to do with pleasure-pain. Only when other things are equal, when all the conditions are repeated, do they acquire that meaning. As it is, great warmth (or intensity) co-exists frequently with indifference; or slight warmth (or intensity) with great dislike or love. [Test this carefully and repeatedly.] The reaction of the nervous centres settles this fact. It is thus that when an acute irritant is present,—as when my throat has been inflamed for some time,—a hardly perceptible sensation is connected with very great pain. Consequently, what one man hates, another is indifferent to, and a third is fond of. We conclude, then, that the feelings are at best only one factor in a pleasure-pain problem.

143.—Inference as a Determining Factor in Pleasure-Pain.

My feet and my feet only are icy cold. I complain; I go to the fire to warm them; and I do not rest until the cold has disappeared.

My action results from wrong inference. Usually when I feel chilled anywhere, I also feel chilled centrally. Under those circumstances it is natural to take measures for increasing the temperature of the body. When, however, the lower extremities alone are cold, there is (sec. 138) a resemblance as to feelings, but not as to the urgency of attending to them. These two factors, as is commonly the case, are confused; and we act as if something were pleasurable when there is an unfavourable neural disturbance, and painful when there is neural serenity.

We have seen the part that quantitative and qualitative reactions play. According to the degree of our education we argue that what is true of one thing is true of another; that what is true of the whole is true of its parts; and that what is true of the parts is true of the whole. In the suppressed reasoning of normal thought we are, therefore, often mistaken, and often draw wrong inferences. What is true generally will, of course, hold good of disturbances. On the strength of one case we assume a certain attitude towards other cases. Often we are justified by results; sometimes not. In this way men constantly suffer pain when they might register pleasure or be indifferent. In practical life, an intelligent point of view in this matter is not sought after, and yet such a point of view is so important that considerations such as are referred to in this chapter, should revolutionise men's likes and dislikes.
144.—Neural Disturbance is Absent from Normal Defensive Activity.

My coat has been splashed this morning by a passing omnibus. When later on I notice the dried mud spots, I forthwith proceed to brush them off.

My view, as has been explained, is determined by organised needs. Though I instantly remove the marks, it is not true that their presence gives me pain, or their absence pleasure. My action is normally decided by the fact that I have previously acted in this manner in accordance with a need. If I had analysed the feelings on that occasion I should have observed nothing which differentiated this action from any other action such as is confessedly indifferent. Again, walking along a thoroughfare I perhaps have to avoid a heap of stones; but that brings me no pain. Having encountered stones and other obstacles before, I avoid them with perfect indifference. It is not a question of the unpleasantness of the mud spots or the surmounting of an obstacle; but a matter of organised reaction. As well might we say that pleasure brought us to act as we did, for the feelings were without perceptible tone. Here is another illustration. Something is irritating my warm palm. I have to choose between continuously attending to the uninteresting feelings or removing them and continuing my trend of thought. Here, unlike the instance of the coat, the solution is urgent. Is it, then, dislike of pain which normally makes me soothe the affected portion? No; only, or at all events partly, custom. As soon as I feel the irritant I instantly, in agreement with organised reaction, proceed to deal with it summarily. Once on a sultry morning, walking across the fields, I allowed the flies freely to congregate on my face. Swarms of them explored its mounds and pits. Both the quality and the aggressiveness of the feelings differed surprisingly according to the parts affected, and in some instances it taxed me severely to remain unmoved. Such cases as those last referred to, would, therefore, create some pain normally; that is, produce a neural disturbance. In accordance with this, persons habitually exposed to discomfort come, through habituation, to bear much without feeling any corresponding strain. They become, for instance, so used to the cold that they think very little about it. Trouble is with them too frequent to be closely inspected, though they are often much more pained or disturbed than their judgment allows. The lesser pains appear like pleasures to them, routine bringing them to undervalue their sufferings. Hardships of many kinds are thus slurred over by those accustomed to them. However, repeated inhibition obliterates to a large extent the neural disturbance, owing to the nervous system becoming accommodated thereto, though pains or pleasures often exist in some degree without being singled out for contemplation.

Our hostile or friendly attitude towards an object is, therefore, no proof of the presence of a disturbance, since in the majority of such instances we are, properly speaking, indifferent. We act in these cases organically,
and not as the result of a neural disturbance. The explanation of the popular belief to the contrary has been given in the last section. Because on important occasions a hostile attitude is connected with pain, or a favouring one with pleasure, it is argued that this holds good in every case, and that only the degree of pleasure-pain changes. The reasoning is ill-founded. There is no neural disturbance, and, therefore, neither pleasure nor pain. The reaction is organised. There need be no motive, no choice, no act of will, no thought, no deliberation, no awareness, intervening between the perception and the action. [Examine cases of this nature which should plentifully occur to you; watch especially the feeling factor.]

In all the above cases there might have been complete awareness; yet this would not have changed the issue. If some feeling, some sensation or some thought develops which does not appeal to us and which interferes with some thought or action of ours, then the particular feeling, sensation or thought is simply removed. In such processes, however deliberate, no disturbance is traceable. A disturbance would develop if our thought or action were permanently checked by something uninteresting.

145.—Normal Thought and Action are Neutral as regards Pleasure-Pain.

The fingers of my left hand hold the note book in which I am writing. [Examine experimentally.]

The feelings here appeal to me indifferently. I feel no tendency to take away my fingers or to keep them there; only the purpose which guides me determines whether they shall maintain their position or not. All normal thought or action is thus neutral. We tend neither to shun it nor to seek it.

Pleasure-pain is distinguished by a partial or a total suspension of inhibition and by the presence of a disturbance. Where there is no such suspense, there is, accordingly, no pleasure-pain. Hence our normal reactions are indifferent, except as regards the ends which they subserve. This may be made more evident by a reference to the previous sections. We there learnt how deliberate inhibition changes the pleasure-pain value of feelings and sensations; how organised reaction makes easy what was once difficult; how there is consequently a general tendency for actions to reach the level of indifference as regards pleasure-pain. The organism, besides, is not disturbed by everything. Such processes as the opening and the shutting of the eyelids, breathing, swinging the arms in walking, are initially immaterial, except so far as our needs are concerned. The normal flow of thought from point to point is likewise indifferent. The neural system remains unaffected by these movements, and our environment to a large extent reconciles us to multifarious activities. In walking, in talking, in the exercise of our senses, the point of indifference, except as to needs, is the normal point, and training only accentuates this condition. A navvy, a woodcutter, or a shunter, apart from a seasoned nervous system, stands shocks unconcernedly which would stagger many a man more
gently nurtured. The nervous system has here, as in similar instances, become adjusted to its environment, and as a result, there is no pleasure-pain.

Thus there seems no foundation for the prevalent opinion which holds that pleasure-pain is a constant or an abiding determinant in the human organisation. That belief is based on wrong inference. From evident facts conclusions have been drawn as to less evident occurrences, and these conclusions are here shown to be erroneous. The changes produced by neural adaptation, and the data which are too minute or obscure to be readily analysed, were misconstrued.


146.—The Relation of the Emotions to Neural Disturbances.

The relations of the emotions to pleasure and pain are various and can be arranged in several groups; but if they are to be closely connected with the subject of this chapter, they must be presumed to accompany neural disturbances. If we encounter anywhere such states as cannot be traced to a disturbance, we must conclude that pleasure-pain is absent, or, if the facts are inconsistent with this, that the theory here advocated is not correct.

Let us start in connection with the last section but one. We there saw that a hostile or a favourable attitude is reconcilable with the absence of a disturbance. If we continue our inquiries along this line we discover that such attitudes are often pronounced without having any pleasure-pain contents. I may, in spite of all effort, be unable to bring myself to do a certain action. I cannot sustain the thought of it for more than a moment at a time. Repeatedly I find the stream of thought deflecting till I am convinced of the hopelessness of the endeavour and I bow to the inevitable. The task itself, the running counter to a pet habit, for instance, is trifling. I am sure that no evil consequences are attached. On the contrary, from the point of view of prudence, of self-respect and morality, I am urged to proceed. The problem here, as pointed out in sec. 139, is not one as to pain; it is one of inability. Owing to our half-hearted attempts and double-faced inclinations the nervous system has gradually been so adapted as not to react in the way we desire. At last, incapacity sets in, and this can only be overcome by an opposite course of training. When, therefore, a child, on a cold morning, shivers and whines rather than look round for his coat, this is not because the cold is less disagreeable than the searching for the coat; but because activity is hampered.* Organised reaction, as

* It has been suggested that in so far as our volitions are powerless, we have to deal with what falls outside a man's personality. This may be plausibly maintained in cases of insanity; but otherwise the view is indefensible. At every point our volitions are determined by results which we have a reason to expect, and not by those we might desire, and to insist upon the above contention, is to deny that any man possesses any personality at all. No doubt, as Paulhan would argue, the most perfect individual is he whose totality of actions strictly agrees with one fundamental need; but that, he would allow, is an idealistic criterion, not a psychological one.
we saw in ch. 3, affects our life in everything: here it eases what is difficult; there it makes easy things difficult. Violent aversion is thus often painless and emotionless, and so it is with violent attachment. A man is a slave to drink; he has been driven well-nigh mad by intoxicants; he hates his inclination with all his heart; and he knows that it has wrested from him all that he holds dear—his good name, his wealth, his self-respect and his health. Yet so unable is he to withstand the temptation that he gladly signs away his liberty for a period, in the hope to escape his evil genius. It would be foolish to think that there is passionate love for intoxicants here. Superficial analogy and a blindness to the effects of organised re-action mislead the judgment. The strong attachment is primarily grounded in an inability to resist. Under the influence of certain stimuli the nervous system tends more and more to yield as drinking is indulged in, until it is paralysed, inhibition having become impossible, or nearly so. Such a change entails no increase in emotional development. On the contrary, the latter is possibly decreasing till it reaches the zero point. The action may be almost automatic. It depends on our education and on our perennial activities, assuming just social conditions, how far we shall be masters of ourselves.

What is true of these two instances is true of all similar ones. The man to whom duty, religion, art, science, politics, business or pleasure [note and check the method of generalising] is all in all, is physiologically in the condition above depicted. He, too, has strengthened his inclinations. It is this which makes him lord over himself. Should he wish to act against his organised inclinations, he would meet with analogous difficulties to those which have been described. For the same reason, on account, that is, of the nature of his developed nervous structure, another man is the victim of ceaseless vacillation, and lives in a land of if's and but's.

A hostile or a favourable emotional attitude towards objects is now more easily explained. First, we meet a neural inclination or disinclination which is capable of growth. This positive or negative tendency accompanies the emotion, and the feeling which is present argues some important difference in which lies the factor we are seeking. Where we have grown to act or to shrink from acting in a certain manner, we are face to face with a normal process. The violence is observed by the spectator; but it is only an example of developed strength. When, again, emotion is present, we have an additional element, for in this case the nerves are thrown into a state of agitation. If we love a thing we are drawn towards it; if we hate a thing we are driven away from it. Emotion argues nervous excitement or warmth, not neural disturbance. For this reason it may be that the repentant drunkard only thinks of his weakness in the presence of intoxicants, and thus the child does not really feel angry with the coat. In love or hate, however, in accordance with sec. 109, the topic has a hold on our thoughts in proportion to the warmth of the emotion. The topic cannot, therefore, be dismissed, except with difficulty, and the presence of an emotion consequently indicates that to the factor of inclination, which
is possibly normal, has been added that of active excitement. Thus the
thoughts of a bad man, as of a good man, flow generally in one direction;
and each finds it difficult to think with the man of opposite notions. In
instances like this, the trend of thought is not determined by a neural
disturbance or by an emotion, and hence disturbances will often indicate
the presence of active neural excitement in addition to neural inclination.
When emotion or excitement accompanies a favourable attitude connected
with a disturbance, we are said to be joyful; when a hostile one, depressed.
The emotion by itself, as far as the feeling factor is concerned, is neither
pleasurable nor painful, and the difference between a neural inclination
and a neural disturbance is fundamental, like that between equilibrium
and absence of equilibrium. The emotions or feelings are classed as
pleasurable or painful because of the neural disturbances which they
accompany, and otherwise they bear no marks which would induce us to
regard them as being pleasurable rather than painful. In their nature
they are neither the one nor the other, but indifferent. Even the warmth
of the emotion is frequently illusory, since it is confounded with the greater
inclination.

Jeremy Bentham, in his *Principles of Morals and Legislation*, 1823, thought otherwise.
"Pleasures . . . and the avoidance of pains, are the ends which the legislator [and
the moralist] has in view" (1, p. 49). And the value of each pleasure-pain is measured,
according to him, by "(1) Its intensity. (2) Its duration. (3) Its certainty or uncertainly.
(4) Its propinquity or remoteness. (5) Its fecundity. (6) Its purity. And
one other; to wit: (7) Its extent; that is the number of persons to whom it extends"
(p. 51). Psychologically Bentham's view is untenable; but it is shining gold itself beside
the rival theories which have their roots usually in religious prejudice and class privilege.
See also in this connection John Stewart Mill's *Utilitarianism*, 1864, and Sidgwick, *The
Methods of Ethics*, 1873, bk. 2, ch. 6.

The hedonic or pleasure-pain calculus is here face to face with a subtle
difficulty. It has to apportion what is respectively due to *capacity, inclination, excitement* and *disturbance*. The average judgment errs seriously
under the circumstances, as it confuses inclination with passion. Because
strong passion often goes along with inclination, men at once argue that
inclination is a measure of passion, and passion of neural disturbance.
There is no such direct relation. The man who has, metaphorically,
worked his way into a dark jungle or to the sunlit top of a precipitous hill
from which it is difficult for him to return, is supposed to be a prey to
an overwhelming passion and to be leading a life either of torture or delight.
Passion, in such instances, is almost incomparably smaller than the neural
inclination, and pleasure-pain and emotion are present only to an insignificant
degree. This holds good generally of such aptitudes as are far
reaching and capable of guiding life as a whole. It is inability and not
dislike which prevents men leaving the narrow path of particular organised
trends; it is neural inclinations and not emotional likings which hold them
there. Actions and activities are, accordingly, proclaimed pleasurable or
painful, a scale of desirability is drawn up and men adjust their lives accord-
ingly, and yet the reasoning is largely a fabric of the fancy. The traps
disclosed by psychological analysis are of such a nature that an uninstructed desire for happiness is utterly unable to detect them.

The emotions are not always connected with disturbances. In anger, fury, rage, the element of pain is scarcely present. It is certain that I cannot truthfully account for being angry, by saying that I dislike or like to be angry. Many a time I have interrogated myself; but neither reply is conclusive. I am angry in consequence of being pained, perhaps. But is anger itself painful? A careful inquiry here classes anger and its cognate emotions under neither heading—not that of semi-opposed disturbance nor that of opposed disturbance. It is a hereditarily determined complex motion of nervous relief, such as is afforded by laughter and crying, by screaming and dancing. Its end is to recover neural tranquillity.*

Another group of emotions requires a different explanation. In wonder, surprise, awe, admiration, horror, there seems primarily a state of neural ecstasy. We are struck dumb; the field of attention is narrowed and its current is forced into one direction, while customary activities are inhibited. When, therefore, the subject which takes us by surprise leaves us unmoved, the state should be considered as indifferent; when the object is interesting, the condition may be delightful; and when the object is terrible, we call it a state of horror. These emotions receive their colouring of pleasure-pain from the other emotions raised by an object. [Distinguish inclination with or without emotions, with or without pleasure-pain. Examine yourself when angry or joyous. Observe the motor aspect in connection with the emotions.]

The question of the emotions has been hotly debated in recent years. On the physiological side, James, *Psychology*, 1890, ii, ch. 25, and Lange, *Über Gemüthsbewegungen*, 1877, have investigated the subject; but the introspective side has been almost entirely neglected. One party insists with Ribot (*The Psychology of the Emotions*, 1897) that “it is not reason which uses passion, it is passion which uses reason to reach its ends” (p. 440). Another party regards emotion as a fourth psychological dimension, and urges that “emotion is introspectively distinct from cognition, pleasure-pain, and conation” (Irons, *The Nature of Emotion*, 1897, p. 256). Then come the Herbartians, who explain away the emotions. Thus Herbart, *Encyclopedia*, 1831, p. 308: “As the movements of ideas facilitate or obstruct each other, so arise the manifold emotional, states, feelings and appetites.” “They are not objects of presentation; but they indicate how the act of perception takes place” (*Psychologie*, 1824, ii, p. 76). He speaks of some emotions (Affecte) as epiphenomena (p. 101). He says that the power of a passion “lies evidently in the power of the dominating idea” (p. 104). Similarly, in his *Lehrbuch*, 1816, p. 29, he says: “Feeling and desiring are modes of ideas,” Godgernaux (*Le Sentiment et la Pensée*, 1804) with other writers, holds a mediate view. “We understand by sentiment a phenomenon of consciousness which is vague and diffuse, and which corresponds to a vague and diffuse movement; and, by thought, a phenomenon of consciousness circumscribed and clear, corresponding to a localised and systematised movement. The borders between these two classes of facts are very uncertain, and it is impossible exactly to determine where feeling ends and thought begins” (p. 196). Münsterberg, again, contends that “sensations are perhaps the most essential factors in emotion, and are not chance accompaniments” (*Die Willenshandlung*, 1888, p. 70).

* Sully finds in anger an “intense element of pleasure” (*Human Mind*, ii, p. 94), and he traces this pleasure to the general heightening of bodily activities. I can discover no pleasure in anger. [Can you?]
Considering the wide range and great complexity of the emotions, it is only natural that psychologists should have substituted classification for close analysis. We shall, therefore, quote only a few opinions besides those mentioned in sec. 138. Bain, *Emotions and the Will*, 1875: "Feelings are divided into sensations (including muscular feelings) and emotions. Sensations, as such, are primary and simple; emotions as such are secondary and compound. The pleasure of a fragrant odour . . . is believed to be a direct and immediate consequence of the physical stimulation; the pleasure of a fine statue is a derived and compound effect; in its formation, there intervened a process of education or acquirement" (p. 69). "The sweetness of a sound is a sensation; the pleasures of a musical composition are accounted emotions" (p. 69). Höfding, *Psychology*, 1891, pp. 282-3: "By emotion is understood a sudden boiling up of feelings. Passion, . . . on the other hand, is the movement of feeling become second nature." James, *Psychology*, 1890: "The bodily changes follow directly the perception of the exciting fact and . . . our feeling of the same changes as they occur is the emotion." (ii, p. 449).

"We feel sorry because we cry, angry because we strike, afraid because we tremble, and . . . we [do not] cry, strike, or tremble because we are sorry, angry, or fearful, as the case may be. Without the bodily states following on the perception, the latter would be purely cognitive in form, pale, colourless, destitute of emotional warmth. We might then see the bear, and judge it best to run, receive the insult and deem it right to strike, but we should not actually feel afraid or angry" (ii, p. 450). My own observation strongly confirms this. Lange’s book (Ueber Gemüthsbewegungen, 1887) is primarily descriptive. The following passage bears out what I have stated. "Indeed, one may without exaggeration maintain that, from a scientific standpoint, we are completely without understanding of the nature of emotion, and that we do not possess a shadow of insight as to the general characteristics of a passion [such as fright or joy], or into that which constitutes the various emotions" (p. 9). "It is to the vaso-motor system that we must attribute the emotional aspect of our life, our joys and sorrows, our happy and unhappy hours" (p. 76). Marshall, *Pain, Pleasure, and Aesthetics*, 1894: "Emotions . . . may not improbably be found to be complex co-ordinated instinct-feelings" (p. 64), and instinct-feelings "indicate the mental states that correspond to instinctive activities" (pp. 63-4). "Emotions" are "(relatively) fixed psychoses corresponding to fixed co-ordinations of instinctive activities which arise upon the appearance of definite objects" (p. 65).

Mosso, *Fear*, 1896, contains a close psychological study of Fear. Spencer, *Psychology*, i, p. 599: "When a particular plexus is excited, it immediately excites the mass of kindred plexuses with which it is organised—the result being that the feelings proper to this mass of excited plexuses are aroused, and in their multitudinous but vague aggregate, constitute the accompanying emotion." Sulz, *Human Mind*, 1892, ii, p. 57: "Emotion is in general describable as a mass or aggregate of sensuous and representative material, having a strongly marked and predominant concomitant of feeling or affective tone." See also Sergi, *Les Emotions*, 1901.

147.—Feeling Pained, and Imaged Pain.

Some one, we will say, unjustly accuses a friend of yours of a questionable financial transaction. *You are greatly pained and grieved, and worry yourself about the matter. You do not like to be pained; and you do not like grieving as such.*

Crying is, as we saw, an attempt at relief. What is feeling pained? You would rather that the accusation had not been made. The withdrawal of the charge would bring you joy. The thought of the libel disturbs your neural equilibrium and excites you. *What is to be done? What will your friend think? How he will be pained! You are depressed at such a suggestion having been entertained. Your affection for him is outraged by such an act. You are full of anxiety.*
Now grief is the consequence of such a state. The momentum produced by the excitement compels us to harp on the topic, while making us impatient of every other thought. To think calmly of other issues after a great event, is impossible to the average mortal under average circumstances. Only a trained power of inhibition coupled with a healthy nervous system, will enable us to counteract to any considerable degree a neural disturbance. Suppression being out of the question, or else we must assume that the grief ceases, there appears to be no alternative but to keep on thinking about the misfortune, especially since our helplessness and the thought itself are added fuel. This tendency is, however, normally resisted. Our resources become exhausted; we recognise the futility of brooding over the affair, and at last we naturally tire of the subject (sec. 28). Our way out of the unpleasant alternatives is simple. We relax our normal efforts and become listless. Our thought is, accordingly, feeble; it excludes strenuous thinking and, by implication, reference to our friend, as also all renewal of excitement. We live in a lower key for a time, as a sick animal will do. When the grief, especially with the calm which comes of rest, has lost much of its hold, we gradually return to normal activity. Meanwhile our general outlook and much of our thought are slightly tinged both by the initial occasion of our trouble and by the physical state induced thereby. I say advisedly "slightly tinged," because the physical contrast suggests a contrast of feelings which does not exist. We are not unhappy; but we vegetate. We dreamily live without troubling ourselves about happiness or misery. Our being is in abeyance, as when we feel the necessity for perfect rest. For the time being we give up our right to meddle with the world's affairs. In all this there is little planning. We naturally fall into the quiet mood, and naturally we persist in it. Whatever we have to learn we learn incidentally. Passive grief, then, is not, properly speaking, a simple painful state; it is rather a lowering of our level of activity for the purpose of recovering neural tranquillity. To the strong soul, however, there is open the more excellent way of manly resignation.*

The essential points to be observed are that a disturbed condition is a deflection from the normal; and that neural states, when disturbed, tend to regain their customary equanimity. Under these circumstances we say that we are pained.

Why do we dislike this state? We have seen that it is normal to man's physical constitution that he should concern himself with a misfortune until it is relieved. Now the thought of a mishap, a serious fright, for instance, sometimes recalls the event so far as it is painful and we then react it in part. Hence the thought of something distasteful will sometimes coincide with what is distasteful, and for this reason we shrink from it, while, at the same time, through organised reaction, we have become gradually accustomed to spurn and dismiss such a thought. There will, therefore, be a

*My temperament is so stoical that grief seldom comes near me. I, therefore, lay little stress on the above analysis of grief. Perhaps some impulsive psychologist will make an experimental study of the subject. [Study the nature of grief.]
tendency quickly to drop that which leads to, or is connected with, anything painful. The more unpleasant the re-collection, the more summary will, of course, be the dismissal. Since also our organism, when not morbid, is uninterested in disturbing occurrences as such, we do not dwell on them. Other wants, normal in their nature, crowd in and expel the unwelcome guest. [Secondary pleasure-pain should be experimentally studied.]

Of course, our judgment often misleads us. We act sometimes as if we were much pained, when we are not. In such an instance pain is non-existent, for the shrinking is acted and not real. We erroneously consider a notion unbearable; but the unbearable is only in the judgment. Hence, except when we discipline ourselves to undergo what at first we only imagined, the supposed disturbance is a fiction. The intensity or aggressiveness of pleasure pain, too, is always an open question. Tomorrow we shall recognize the simulation of to-day’s pain, and in the light of better judgment we shall observe what obstinate error alone could fail to remark. [Examine yourself very carefully when much tired or ill or in low spirits, and in the opposite moods. Also when you think of pleasant or unpleasant events.]

148.—PRINCIPLES RIDE ROUGH-SHOD OVER DISTURBANCES.

A man is watching some boys who are boating. Their loud laughter, their flushed faces, their restless eyes and their general animation bear witness to their whole-hearted enjoyment. They ought to have been at school; but they could not resist the invitation of the smiling day and the sunny river. To our spectator, boating is no temptation, though in his own way he is able to appreciate it as much as they. If, however, it be a choice between the river and the performance of a duty, he unhesitatingly inclines to the latter.

After what has been said in the preceding sections, this instance will not appear as extravagant as it might otherwise do. Why does he incline towards the duty rather than towards the boating? It might be replied that the duty affords him more pleasure or more satisfaction than the boating; but this is not the fact. Let us analyze the case more in detail. The duty is to go home and write a promised answer to a letter. The matter in itself has only to do with a trifling transaction, the delay of which would be immaterial. In writing the note there is no appreciable excitement of any kind, pleasant or otherwise. The river, on the other hand, offers exquisite enjoyment, and hours of it. Yet without any struggle, without weighing arguments, without reflection, without excitement, without disappointment, he turns homeward. With all its allurements the river has no fascination for him. Imagine, however, no duty to stand in the way, and he enters enthusiastically into the sport.

Such are the facts, pure and simple. What is their explanation? That his decision is due to the greater pleasure the duty holds out, is an untenable theory in this case. That pain has any appreciable influence here, must be denied. On the face of it, he acts in an organized fashion. He
goes straight for the duty; he proceeds as he has proceeded before; and his action is unaccompanied by any emotion or reflection. The decision is as readily arrived at as if both courses were palpably indifferent.

We have seen how, by inhibition, things which have an immense disturbance value, often lose it altogether; how we can fix or ignore them; how if we so will, they become meaningless from the pleasure-pain point of view. The greatest possible prospective pleasure, given developed nervous strength, can thus lose all its charm, possessing no more power to move us than if it were dead or forgotten. We contemplate it placidly as we might a psychological curiosity. Under these circumstances the pleasure of boating and the performance of a duty are reduced to the same simple category, and each leaves us unconcerned. Deliberation and comparison are absent. The measure we apply is one of principle and not of pleasure-pain, while we are guided by general and organised considerations and not by passing special considerations. It is not that the duty triumphs over the pleasure; but that an organised inclination, disciplined to accord with some general principle, carries the day.

In the instance under discussion, the effect is not produced by deliberate or thought-of inhibition. On many prior occasions the man had practised inhibiting courses of conduct which were opposed to duty. Gradually inhibition grew more easy, until at last it became organised. As soon as a desire then arose which conflicted with duty, so soon was it dismissed. Except for duty's sake, it was difficult for him not to act in this way, and for the same reason, his thoughts ran on the problems of duty. On account of a confirmed inclination the notion of boating, under the circumstances, appears pale and indifferent when regarded from the emotional and imaginative point of view. It has no attraction whatever. Nor has the thought of duty anything to recommend it in the particular example. Provided that his notions on the subject have remained unchanged, he simply proceeds to the performance because he has proceeded thus in the past.

A consideration of sec. 109 makes it obvious that strong excitement is usually unprofitable to the human organism. An emotion, we there learnt, tends to persist in proportion to its warmth, if we except shallow persons and dream-life. Hence, instead of being able freely to disregard topics, we have no option in the presence of strong excitement, but to develop them, and that makes normal thought impossible. Instead of progressing with whatever task we have in hand, we are forced by excitement to linger by the way and ponder over otherwise unengaging trifles. If the field of attention were like the limitless ocean of space, it would be within the range of possibility to follow out every conceivable line of thought or temptation. As it is, attention being rigorously limited, a large quantity of imaginable arguments, reasons, motives and temptations do not, or at least are not bound to develop. They are eliminated by the struggle for the field of attention, and we march, therefore, swiftly from position to position.
SYSTEMS AS DISTURBED

We understand now how some psychologists quietly analyse the pleasant humour of the company they are in, instead of merely enjoying it; how they listen to a great singer with nothing but a psychological interest; and how they take an argument to pieces instead of judging of its value. Such investigations are far from implying callousness. These psychologists possess perhaps as keen a relish as anybody for humour, song and argument. Only they have deliberately, or incidentally, disciplined themselves to psychologise freely. By often analysing, the power, as described in ch. 3, has insensibly increased until their ability has become highly specialised.

What is true of the moral man and the psychologist holds good, by parity of reasoning, of men generally. Wherever we find an absorbing pursuit, there the emotional and the pleasure-pain value of objects is continually ignored. Without deliberate inhibition we then pass by temptations with indifference. We have seen that this must and does take place in normal thought, and, accordingly, we must allow that pleasure-pain has not the decisive and perpetual influence attributed to it. Its proper function is readily defined: pleasure, or the attempted preservation of neural disturbance, makes, within certain limits, for private and public robustness; pain, or the attempted escape from neural disturbance, similarly restrained, serves the same object, as we have seen in sec. 142. By training, pleasure-pain may be rationalised; and this must be one of the aims of education. Hearty enjoyment could then be encouraged without fear of extravagance, as also necessary stoicism. The primary intention of the reactions which follow on pleasure-pain is, largely by means of inherited measures, to protect the organism against violent attacks.* Natural selection has accordingly favoured nervous systems which are duly attracted by the good, and repelled by what is evil. Indeed, were the system not sensitive to what is beneficial or hurtful, our race would have no chance of existing at all. If we tend away from the normal condition, it is because of the tendency of the organism to react in that manner. When the tendency is in the contrary direction, that is to say, when we hasten towards the normal state, we call the impelling object painful. To say that we like what is pleasurable, is to say that we like what we like, or that A is A. To say that we like what is painful, is to say that A is not A, unless, indeed, we use the terms “like” and “pleasure-pain” in various senses. When we speak of pleasure-pain, we assume

* According to Horwicz’s general doctrine in his *Psychologische Analysen*—and Horwicz does not stand by himself—all the senses as well as thought are bare modifications of the sense of pleasure-pain. In connection with this theory, the following may be quoted from Höfling’s *Psychology*, 1891, p. 288: “As smell and taste facilitate a pre-examination, which prevents anything injurious to life from received into the alimentary canal, and as smell gives notice of the approach of the enemy or of the prey, so too, sight and hearing are from the first in the service of instinct.” In fact, so far back as Berkeley this was recognised: “We regard the objects that environ us in proportion as they are adapted to benefit or injure our own bodies” (*New Theory of Vision*, 1709, sec. 59). And so James, *Psychology*, 1890, ii, p. 172: “Even to-day the main function of the peripheral organs of our retina is that of sentinels, which, when beams of light move over them, cry ‘Who goes there?’”
accordingly that a neural disturbance has taken place, for otherwise unnatural antitheses are easily established. [Test this section experimentally.]

Prof. James (Psychology, 1890, i, p. 144) says: "If pleasures and pains [as feelings] have no efficacy, one does not see . . . why the most noxious acts, such as burning, might not give thrills of delight, and the most necessary ones, such as breathing, cause agony." The meaning of the same feelings varies, I hold, with circumstances, contrary to what James assumes. If I abstract from the thrill the violent physical change of a particular kind which accompanies it, I am at a loss to find a name for that which remains; it might be an agony, for aught I know. James' theory implies that a man might shatter, be shaken to his foundations, take hurriedly to flight, rid himself of an enemy, and yet be contemplative, calm, unmoved and attracted. Let these latter elements be eliminated from the thrill of delight, and we have left something resembling the famous cat's grin without the cat. Surely, on James' hypothesis of a feeling added to an act, there is no reason why bodily agony should not be accompanied by thrills of delight, i.e., a buoyant desire to maintain the agony.

149.—MOODS LARGELEY DETERMINE THE DRIFT OF THOUGHT.

My head aches badly. It has been worrying me for several days. I cannot think; I am in a depressed mood; and my thoughts are gloomy. I do not like being in this state.

Where there were no feelings previously about the head, I now note some. They have come without my bidding; they are staying independently of my wishes; and they will disappear at their own sweet will. They are the result of certain changes or derangements in the nervous system. They possess no meaning apart from these changes. In themselves these feelings are neither pleasurable nor painful, and it is the accompanying circumstances, some of which they represent, which lend them a fictitious value. Were it not for these, the feeling might be wholly indifferent as are those connected with my sitting while I am writing at the present moment. Being, however, related to important neural states, they loom large. Their unimportance is readily proved. I but proceed to study them for a few moments, and their pleasure-pain pretense is instantly suppressed, for while the feelings continue, the pain has ceased. Like the moon, the feelings shine with borrowed light.

Co-existing with the headache is an inability to think freely. My surroundings and my life and existence bear a striking resemblance to a mist. I seem to be dozing all the time. As the distant sea only murmurs, while we hear it crash and boom as we draw near; so the normal vividness of thought seems far-off and appeals to me but faintly. If I were to remain for ever in that condition, not another vigorous notion would bud within me. The sensations and feelings have, of course, nothing to do with this dull state on the thought exchange. An additional argument in favour of this view may be found, if required, in the fact that such a state of torpor often overcomes us, without being accompanied by the aggregate of feelings we call a headache.

Though is circumscribed in other ways. In secs. 109-11 we studied
the part played by excitement. Under its influence we continue feeling, reasoning and imagining when the ostensible occasion is past, and the same thing is true of the present case. As the derangement of the headache is present, neural activity is concerned with that. Though we think now of this thing and now of that, we tend, because of the persistent excitement, to return to the thought of the headache. Hence we are constantly revolving the headache in our thoughts, and we are never long away from the gloomy subject. We do not choose the theme; we should prefer thinking of what is pleasant; but it is imposed on us. The presence of the neural excitement is a factor forcing the matter incessantly to the foreground. While we are thus liable to be unduly concerned with what is troubling us, there is a contrary inclination to be considered; that is to say, as a weight strives to reach the centre of the earth, so there is a dogged tendency on the part of the neural system to regain its quiescent condition.

One method of using up the attention, as we have seen, is to try to remove the headache. In this way we do more than justice to the excitement, for we surreptitiously introduce hopes which are in themselves agreeable. A gleam of sunshine is thus gained, and the forcible discharge in itself gives some ease. Any vigorous activity ordinarily helps; but that connected with the neural centre afflicted yields relief most readily. If, in consequence of this, the abnormal tendency abates, the normal one increases in power correspondingly, and as that is most likely to happen when we make an extra effort to recover ourselves, such a state tends, organically, to develop. As the result of natural selection, the nervous system drifts in that direction largely of itself.

Besides the incessant occupation with the headache, due to the neural excitement, we learn of another channel of relief. It is obvious, as in crying; or it may be hidden: the eyes, the eyelids, the forehead, the muscles of the face, the heart, the lungs, in short, nearly the whole organism may be involved, the tension being widely distributed. This activity relieves the affected centres, and is to a large extent instinctive; or, at all events, there is a predisposition which makes such discharge normal under the circumstances. If this be so, however, it must react on our thoughts. It will tend to fix the attention on the headache, and keep it there.

There is yet another direction into which our thoughts tend to flow. All cases which are similar to those of the headache; all sensations which are consistent with the excitement and the peculiar general organic disposition, will take precedence over normal thought (sec. 109), and thus gloomy adventures of every kind will by preference attract us. Since the attention is bound to find employment, and since normal thoughts are out of the question and the subject of the headache is exhausted, we revolve related subjects, such as other headaches, ills generally, disappointments, etc. The stage of thought, like a chamber of horrors, is in this way sometimes packed with gruesome figures. One dismal apparition follows
another, and a long procession of monotonous anxieties harrows our feelings. The darkness is deepened till there is scarcely room for the faintest beam of light. Even when the headache is gone, the twilight of despair yet haunts us. It is not that we like these gloomy guests, or that we have invited them. We do not love them, and we do not invite them. An hour's sleep would be so pleasant; but they will not depart. There are other scenes which we are trying to revive and retain; but in vain. Were the discharge of energy in our keeping, we might bring pleasant subjects to the front, or we might reduce the discharge till it just sufficed to fit us for our work (sec. 134). Our likes, however, must stand aside. The attention must be occupied, and can only be occupied with unprofitable topics. Our needs, accordingly, are not the exclusive builders of the track which our imagination is following, and our desires often represent nothing more than the normal neural tendency to regain or escape regaining the lost equilibrium. It seems certain that the above explanation of the gloom, as being the result of excitement, is the correct one, and that the issue was not determined by desire for pleasure or fear of pain. Even organised reaction plays an insignificant part here, for the nature of the excitement is one important factor, while the other is the necessity for thought. For the same reason we must equally reject the notion that I selected the topics or that they were due to a process of ideational association.

What holds good of a mood thus created, holds good of all moods. The waves of excitement, when we have been hurried into a violent passion, will not at once subside, however large a quantity of the oil of reason we pour upon them. In such a mood the noon-day sun itself appears dull and cold; a pall hangs over everything; and our dearest friend is not what he should be. We charge the daisy with pride, and the wild rose we taunt with being an abandoned pleasure-seeker. In a spirited mood, on the contrary, the opposite view is taken of the world. The very mud in the street speaks, whispers soft nothings as we tread on it, and dances as if in sport. Death has no sting left. Others’ misery leaves us unmoved.* We reproach ourselves for our levity; but how hollow is the reproach. We dismiss what is unpleasant, and what would otherwise have irritated us, is now a superb jest, provoking laughter. Strictly speaking, this uncontrolled joy does not result from any writ by which we may have summoned it to the sessions of thought. The mood we are in,—the peculiar nervous excitement due to the prick of a need or the state of the organism,—explains the interest with which we regard even the meanest topics, and we can no more arbitrarily dismiss this condition of thought than we can its brother born of gloom. Two extremes have been depicted; but the argument holds good generally. We are, as beings goaded by needs, always in some mood or another. Indeed, many individuals, for long periods together, remain in some pronounced mood. The current of our thought is for this reason determined primarily by our needs, and secondarily by the consequent excitement. Pleasure, fear of pain, and choice, are

* That is one reason why young children appear callous.
not the great powers which decide whither our thoughts shall commonly drift; this is determined by our organised needs and the nature of the neural mechanism. Our analysis reveals an apparent exception to this, for in ch. 5 we saw that ordinarily little excitement is present. In this restful mood we have a certain amount of liberty, though the excitement involved in recency is the support for any train of thought. Moreover, the depth to which we feel, is determined by our organism. Our passions may be but passing clouds, hiding the light for a few moments, or they may rage tempestuously for considerable periods. The various stages of individual development—from birth to death—have corresponding moods, and these, subject to the underlying needs, are the great rulers in the realm of thought (sec. 152). [Determine carefully the drift of your thought in various moods. Practise also to think out of relation to a mood, and try to suppress and encourage moods. Do not forget that the general facts must be arrived at by examination, and that "opinions" mislead.]

One day I repeatedly felt that everything seemed to act as an irritant to my temper, and that uncharitable thoughts were in the ascendant. After due reflection I discovered that some unpleasant event of which I heard that morning had left its sting behind in the form of a disagreeable mood. Here the mood may be considered as corresponding to a disturbance of neural equanimity. Certainly the thought of the event—visual, audible, verbal, tactile—had nothing to do with my bitter reflections throughout the day. As with this somewhat abnormal condition, so with much that is normal. Dyspeptic, choleric and weak-nerved people are perpetually influenced by their nervous state; and so are those who are of a robust and buoyant constitution. In the same manner, the innumerable many-coloured prejudices or inclinations which few people are without, sustain a particular class of thought. Interest, attention or absorption act similarly. The effect of recency and memory is but one aspect of these moods. So also our genuine wants guide and tone our thoughts.

On one occasion I received some critical news, and I was much affected in consequence. I noticed that my thoughts were so many frowns. I then began to observe and to experiment. There were the usual symptoms of excitement, though the notion which was responsible for them only developed now and then. I noticed that, on the one hand, there was the tendency to re-develop what was unpleasant, while on the other, indifferent or pleasing thoughts which I had deliberately re-produced were quickly permeated by an atmosphere of depression. A certain physical state, then, however produced, brings forth, favours and transforms thoughts according to a certain plan. Ideas, in the sense of visual and aural images, are, therefore, not the only means of originating certain classes of thoughts. [Experiment and observation on an extensive scale are easy in matters of passion.]

150.—Conclusions.

It will be as well to bring together the scattered conclusions arrived at in this chapter concerning neural disturbances.

(1) So-called pleasure-pain feelings do not admit of being arranged according to pleasure-pain degrees;

(2) nor can so-called pleasure-feelings be divided from other pleasurefeelings or pain-feelings, and so-called pain-feelings from other pain-feelings or pleasure-feelings as regards pleasure-pain quality;

(3) nor can so-called pleasure-pain feelings be divided from indifferent feelings;
(4) nor are feelings ever directly connected with each other;
(5) nor do they give birth to movement of any kind;
(6) nor do they influence movement of any kind;
(7) nor, consequently, can they raise or lower vitality;
(8) but feelings follow or accompany movement;
(9) and they are for the time being classed as pleasurable, painful, indifferent, strong, weak, important, originating and passive, in agreement with the changes in thought and action with which they are found to be connected.

(10) The nervous system has only a limited power of resistance;
(11) its normal work leaves the body free from disturbances;
(12) organised activity is guided more or less by developed inclinations;
(13) organic needs make the brain act as it does:
(14) under certain conditions the nervous equilibrium is disturbed;
(15) it then rights itself by deflecting the attention,
(16) by inhibition,
(17) by a lowering of vitality,
(18) by forcible expression, as crying or laughing,
(19) by thinking of means to right the equilibrium,
(20) by removal of the irritant. Also
(21) ordinary defensive, inclined or preventive action is indifferent as regards pleasure-pain;
(22) inclination is no measure of capacity, disturbance or emotion;
(23) organised reaction, inference and one's point of view, largely influence the nature of reactions;
(24) pessimism is unjustifiable in theory, and, therefore, inapplicable to fact; and
(25) an organised trend, such as is exemplified in walking, typifies indifference; smiling faces typify pleasure—a state where we tend for a time to maintain the disturbance; and sobbing typifies pain—a condition where we strive to regain the equilibrium.

151.—A Bird's Eye View.

Needs or functional tendencies normally realise themselves according to inherited and acquired inclinations, and not as the result of disturbances. Disturbances are rare events; they betoken the absence of ready physical or mental adjustment, and they are partly dealt with by inherited reactions, by inhibition, by turning away the attention, and by other means. We must distinguish one from another: needs, disturbances, capacities, emotions or excitements, inclinations, neural momentum and moods. Pleasure-pain is to be described as a neural or mental disturbance, and not as an unanalysable subjective state. We must allow for organised reaction and wrong inference, and for the fact that feelings give us no clue to the nature of pleasure-pain. For the compound word pleasure-pain we may employ the term neural disturbance; for pleasure, semi-opposed disturbance; and for pain, opposed disturbance.
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