of so-called hydrophobia successfully treated with curare. We have before us Dr. Offenburg's thesis, containing all the details of the case. It is, however, impossible to read it with care without seeing that it is extremely doubtful whether the case was one of hydrophobia. Judged by the description which the author himself gives, it might be pronounced a case of *hysteria*, of which it has all the characteristic symptoms."*

"We all know how, in Goldsmith's imitative ballad—

'The dog, to gain some private end,
Went mad and bit the man.'

"And we also know that to the surprise of all Islington—

'The *man recovered* of the bite,
The *dog* it was *that died.*'

"There is a moral in the Doctor's nonsense."† But a consideration of his moral, as well as of that to be drawn from the remarkable series of incidents narrated in the foregoing pages must be deferred; perhaps to be dwelt upon, with the fulness to which its importance entitles it, in some future contribution to the "Journal of Mental Science."

The Physiology of some Phases of the Poetic Mind. By Fredkrick Treves, M.R.C.S.

As the knowledge and appreciation of light are rendered more distinctive by the near presence of a shade, and as the idea of absolute smoothness is presented to the mind with a keener readiness when viewed in relation to an inequality of surface; so in mental science such phenomena as are normal, and therefore in a sense unvaried, are better known when studied in connection with others that are abnormal, and in consequence more clearly to be individualised.

The pursuit of psychology has a difficulty that no other science can possess; and it is this—that the object examined and the subject examining are similar, or differ only in the slighter details. Mind is brought to examine mind, as a lens would be to examine a lens; so that simply to observe and to record facts, the very first and most elementary principle in all science, is in this branch of knowledge fraught with difficulty and obscured by doubt. The obser-

* "British Medical Journal," November 17, 1877, p. 708.
† Article on "Dogs" in the "Graphic," September 9, 1871.

vation cannot but be tinted by the characteristics of him who observes; its bare appreciation even will depend upon varied and unstable elements, for it is to one and the same instrument that each psychological fact is brought, not merely for record, but also for analysis and judgment; just as if the value of all mechanical force were to be judged only by the physical power of each individual observer. In the physical sciences there are known standards, common to all investigators, for estimating the value of phenomena, so that independent students can obtain similar results. Heat, colour, tone, and sound can be valued by a recognised measure; but mental science has no such exact and unvarying standard; views must differ as to what are the attributes of a normal mind, and therefore the value of any given mind motion must depend to a great extent upon the judgment of each individual student of the science.

It thus happens that the most satisfactory results in psychology have been obtained by the study of abnormalities of mind, of the different forms of brain lesion, and of the various species of insanity; because in these instances the peculiarity is so marked and distinctive that the majority of other minds might be regarded as practically normal when viewed in relation to them.

Now such minds as are imaginative or poetic in a marked degree must be regarded as abnormal, inasmuch as they are not common and present phases that are in each case more or less unvarying. Regarding, therefore, a poet's brain as abnormal, its study has been considered to be justifiable and one that can be conducted on more or less sound principles and with more or less reliable results. The importance of regarding the poetic mind as other than normal is urged as a preliminary point, in order that the bias of sentiment and preconceived views might be put aside, and that by the use of such common means of enquiry as are applied to other, and perhaps more prominent, mental abnormalities, more common grounds of argument might be arrived at.

In the first place it is most needful to obtain distinct views as to what are the essentials of poetry, and to clearly understand what are at least the most prominent attributes of the poetic mind. The art of poetry, like that of music and painting, is complex, and involves many considerations. In music, for example, we must regard the mind faculty as alone essential, and eliminate from its study, as mere

accessories, its simple physical modes of expression, the fingering of the keys, the handling of the bow, the management of the strings. So in the painter's art it is easy to conceive that an ordinary individual, endued with dexterity of hand, could acquire by patience and practice as great a skill and readiness in the use of the brush and palette as a Turner or a Reynolds, and yet be as lacking in the very living impulses of his work as a mirror without light, or a complex battery with empty cells. When all mere accessories are cut out from the pure idea of the poetic function its peculiar or distinctive properties will be found to be but simple. A process of analysis that would exclude all the non-essentials of the faculty would demand an omission of the following factors of poetry, so called. In the first place, the mere verse making, the simple rhymester's work, the pure handicraftman's portion; this and all the varied tricks with words bear only such relation to poetry as do the marble and the chisel to the visions of the sculptor, or the keyboard to the melodies in a Mozart's brain. They are simply methods of expression, shared alike by the epic writer and the veriest mumbler of rhymes; and, as mere means, have no value apart from that derived from the brains and hands that use them. Moreover, to reach at the more essential principles, it is needful to exclude all that is merely descriptive, all simple analyses of action and emotion, all such elements as are purely argumentative or involving simple metaphysical discussion. In much that is given to the world as poetry there may be descriptive passages, which, when dissected from the jingle of verse and the formal trifling with words, will appear as sober prose. A page from a treatise on philosophy may, by a simple change in its garb of letters, pass muster as poetry, and yet be lacking in the one thing needful to render its claim to that title a logical and a just one; albeit it must be owned that such passages, although holding no individual right, might yet obtain a doubt as to their nature, by assisting in the expression of a poetic fancy, and by being considered as simple parts of a poetic whole.

By a process of exclusion, therefore, that which constitutes the spirit or principal characteristic of the poetic faculty, would appear to consist of this purely—the power of fancy or imagination. As the pointed arch forms the principal feature of the Gothic window, so this power may be regarded as constituting the great essential of the art of poetry; and

to it, in the present instance, attention will be exclusively directed, not as to the sole, but as to the pre-eminent characteristic, for in any matter of so subtle and involved a nature as that now under consideration none other than the most evident features can—in a preliminary enquiry at least—be regarded.

The terms "fancy" and "imagery" are somewhat widely and perhaps vaguely applied; but in the present instance they will be regarded as being practically synonymous, inasmuch as they differ from one another only in degree, and may be considered as shades or phases merely of the same species of mental action. Without entering into detail as to the relative properties expressed by these two terms, it may be remarked that to both, but to imagination in particular, it is common to ascribe some creative faculty. But to mentally create or evolve mind material *de novo* is not a property of the human intellect. Existing ideas and conceptions may be arranged, rearranged and elaborated, and novel forms produced as varied as the figures in the kaleidoscope. These forms may be said to be in a certain sense created, inasmuch as they may never before have been produced under their present aspect; but their elements, their factors, are no creations; they are the separate pieces of coloured glass, the pre-existing ideas that the active mind can group in myriad forms limitless in number and variety. Caliban is no creation, no being evoked from a mental void; but like a piece of cunning patch-work, he presents a master's grouping of elements, of characteristics gleaned here from the man and there from the beast, and that, like the separate fragments in the kaleidoscope, have fallen together into a figure striking and defined. This fact is here brought under notice in order that any tinge of the supernatural may be excluded from the present question, and that it may be evident that we are dealing with no other than ordinary mental elements.

Imagination, as applied to poetry, may be regarded as a power that can add to any ordinary idea a distinct and new intelligence, and engraft upon it unusual or original elements; such addition or grafting being in every case in accord with accepted æsthetic principles. The terms "ordinary," "new," "unusual," and "original" must be regarded and are used in a relative sense only, inasmuch as whatever involves any consideration of novelty must depend upon such uncertain and ever-changing bases as are afforded by

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individual minds and peculiar circumstance. In all efforts of fancy or imagination, these two factors will be found to be present, a re-construction of idea by the grafting thereon of novel elements, and a compliance with what are termed the laws of beauty. And in relation to this subject a singular passage by Francis Bacon may be quoted, wherein he says, "There is no excellent beauty that hath not some *strangeness* in the proportion."

The above definition can perhaps be rendered more evident by instances. Our ideas of external objects, for example, and of the associations that they give rise to in each individual, depend upon and have origin in, certain factors that must be regarded as accidental to a certain extent; these are hereditary disposition, education, habit, development of the mental and moral powers, the peculiarities incident to climate, custom and country, and, indeed, all those elements that constitute an individual as an individual. A butter-cup cluster in the fields in spring may give rise to some vague composite feelings of pleasure in the mind, a pleasure that would spring from some appreciation of the simplicity of the flower, its daintiness of colour and tenderness of shape, or from some personal incident or recollection. Such ideas are ordinary, and depend for their distinctiveness upon purely individual peculiarities. So that to another mind the same spring flower may be passed with complete indifference, or even regarded with contempt. Now if imaginative power be brought into play, it would add to this simple idea of the butter-cup another that would be both relatively novel, and in conformity with one's principles of beauty; so that he who first spoke of this flower as "a pale gold cup" would add to it a fancy, and be at the same time considered to have exercised the faculty of a poet.

So is it with every other subject touched by poetry, from the simplest epithet to the daisy to the grandest flights of thought; for in either case if the distinctive features be sought it will be found to be the development or addition of novelty in idea blended with a consideration for effect; the term "novelty"—it may be necessary to repeat—being used in a relative sense only, and with as little regard to its purely conventional meaning as possible. The ideas of love, of passion, of the various phases of human emotion that are framed by a normal mind, are such as depend upon experience, upon mental and moral training, and upon idiosyncracies of thought; and if the reader, with but his

own simple ideas on such topics before him, peruse an ode to love or a sonnet to some other of the passions, and then carefully endeavour to search out what has been the distinguishing feature in the poet's work, he will attain the conclusion that it consists simply in the fact that new elements have been cast among ideas that may be regarded as normal or ordinary, and that this or that passion, and this or that phase of humanity have been presented to him in a light that is at once novel and æsthetic.

Both elements are needful; it is not sufficient, on the one hand, that familiar ideas be expressed in more æsthetic terms, nor that a newness of thought be the only characteristic, on the other; but it is the co-existence of these two elements, it is urged, that actually constitutes a distinct intellectual feature. Both the value of the foreign element in the idea, and the standard of beauty set up in the mind, must, of necessity, vary with the culture of the reader and his own peculiar forms of thought; so that it will happen—as Macaulay well remarks—that poetry becomes less easy and less exuberant as the march of learning and civilisation advances.

Among the ancients poetry flourished in a form at once the most simple and the most easily to be understood.

The ancient Greek saw in the floating cloud a moving wing, in the summer wind a goddess's whisper, and in the noise and babble of the waves the voice of the old man of the sea; to his simple idea of the things in the world around him he added a new sense fresh and beautiful, and so created a poetry of vivid and intense loveliness, a religion of winds and waves, a morality of sunlight and spring glories.

The same principle holds good for all other forms and varieties of poetry. In a passage of verse purely metaphysical, such, for example, as one might find in Bailey's "Festus," if the reader will put aside as mere accessories those elements of the composition above enumerated, he will find that the property that, more than any other, renders the passage distinctive, its very essence as it were, will consist of this—either old matters of thought and workings of mind are brought forward in a novel garb, and illumined by a light hitherto unknown, or new ideas and new impulses of action are introduced into some fresh world of thought, and the pioneers of originality into some as yet untrodden plains of enquiry. And in either case the rule of beauty will be observed. So, too, in poetry purely mystical; in such a kind, for example, as "The Rime of the Ancient Mariner," a similar

ruling characteristic will be observed. Here to such scanty ideas as would arise in the mind of an ordinary individual from the contemplation of a ship, a sea, a sea voyage and a mariner, are added ideas of a brilliant and wondrous novelty. A glare as from an unknown world is shed upon it all, and a sea spreads out before the eye such as never broke upon a beach, and a barque glides on such as no mariner has ever seen and no breeze has ever blown upon; yet withal a ship and a sea; and an analysis of the chief power and essence of the poem shows unusual construction of idea blended with what in beauty is terrible and mysterious.

It must be held in mind that the standard of beauty observed in all forms of poetry must of necessity vary with circumstances and with the varying influences of country, nation and age, so that as it is impossible to frame an universal—or as we might even say, an international—standard of æsthetics, so are we unable to bring the poetry of all times and of all peoples before one common seat of judgment.

Thus it is that it is both unjust and illogical to condemn as unpoetical any work that, while it is freely accepted as poetry by the whole people in whose tongue and for whose purpose it was written, is nevertheless lacking in those features which we deem essential to our own peculiar idea of the beautiful. The savage singer, therefore, who speaks of the lips of his lady love as being "sweeter than the hot blood of the enemy," should be considered to have exercised the poetic faculty in as sure a degree as if he had sung of them as the "opening petals of a rose," and whispered his lyric in the daintiest boudoir, rather than yelled them forth by some wild camp fire in the forest. Inasmuch as by his metaphor he has given birth to an idea at once new in construction, and in conformity with his own ideal of beauty—however dwarfed the modern critic might hold that ideal to have been—he obtains a claim to be considered as a possessor of at least one function of the poetic mind.

Presuming the above remarks to be at least approximately correct, it will be possible now to enquire into the physical bases of the function, and to attempt some explanation of the physiology or modes of action of the imaginative brain. For the performance of the simplest form of action—the reflex, or that performed without the present intervention of consciousness—the following physical condition is demanded, a central ganglion or collection of central nerve cells connected with two nerves, an afferent and an efferent. This condition

represents the simple or fundamental plan of a nervous system, and constitutes the sole nervous organisation of the lowest forms of animal life, as well illustrated in the structure of the ascidian. The central ganglion is the organ whereby the force of a peripheral stimulus is converted into the force of muscular (or it may be other) activity, and so, as it were, *reflected* to the periphery again. The nervous centre of man may be considered as made up of a vast collection of such simple nerve apparatus, and the tickled foot of a sleeping man is withdrawn because there exists in his cord certain cells capable of transmitting the stimulus of tickling into another form or aspect of force, viz., muscular action.

Much attention has of late been drawn to the fact that many actions, commonly presumed to involve in each performance an active interference of mind, are in reality purely reflex or automatic, and involve no direct effort of consciousness. Such actions have obtained the name of secondary or educated reflex acts. The nature of these acts is thus explained. Any action or movement, although at first performed consciously and with the active and evident interference of mind, may by very frequent repetition become at length automatic; what was at first a purposed act acquiring the character of those known as the purely reflex. Each repetition of the supposed action or movement will involve on each occasion a certain definite activity of the connected cells and fibres representing that act; and as we see in other instances that frequent use or activity of any organ is followed—as a consequence—by its higher structural development, so in the present instance the frequent repetition produces such organic changes in the nerve channels by which the repeated action is accomplished that it becomes to be—as Dr. Maudsley well expresses it—"organically registered" in the nerve centres.

As that author ably remarks,* "acts consciously designed at first, may, by repetition, become unconscious and automatic, the faculties of them being organised in the constitution of the nerve-centres, and they being then performed as reflex effects of an external stimulus." So that for any given movement (to use that term generally) we may presume a special collection of central cells to be developed, and such cells may be considered to be the physical representatives in the nerve centre of the actual movement,

* "Body and Mind" p. 11.

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so that a suitable stimulation of those cells will always be followed by the same movement and by none other. To take an example of these remarks from one of the more complicated mechanical actions. Any one who has observed a person engaged in the intricate process of envelope-folding will be surprised at the extreme rapidity and machine-like exactness with which the movements necessary for the folding of a recently made envelope are performed. Now, it will be found that the folder will do his work almost entirely automatically; although his hands may be active, his mind may be engrossed in other things; he may even cease to watch the movements of his fingers, and will be unaware of any direct mental effort in the complicated process with which he is engaged. Indeed were it to be supposed that the folding of each envelope involved active mental interference, and that each single movement was guided by consciousness, then the necessary manipulation would involve an amount of mental energy most exhausting, if not absolutely impossible of being maintained. Now, in the first essays of his business the folder will perform each movement deliberately and with conscious effort, the process will be slow and exhausting, each motion will be guided by the mind and will be carried out with a deliberate purpose and in a definite and pre-determined manner. But by frequent practice of his art, the workman will become at each repetition more and more expert, every day he will be aware of less and less effort, and every day he will involve less and less the action of consciousness, until at last his fingers will move under the stimulus of an unfolded envelope without his being scarcely conscious of their activity. In this case the same actions, elaborate and complicated though they be, have been performed a vast number of times; the same nervous paths have been traversed over and over again, until at last what was once a tangled way requiring an effort for a passage to be forced, becomes a clear and well marked path; just as frequent footsteps will render evident a road that might once have lain hidden and unknown. Here the stimulus, which may be represented by the presence of an unfolded envelope (although many other factors are involved) travels along certain centripetal paths to definite cells situate in the central nervous system; by these it is reflected centrifugally along other channels equally defined, until at length it appears in the form of a regular muscular movement. Frequent repetition will render the development of these paths of conduction more and more perfect as regards the particu-

lar actions they are instrumental in displaying; so that each action or group of actions may be finally regarded as organically registered in the central cells, and these central cells as organically connected with a certain stimulus on the one hand and defined muscular movements on the other. At the period when the nervous path was imperfectly organised, the guidance of the mind would be required for the proper conduction of the stimulus and for the proper performance of its corresponding movement, but as its organisation is rendered more complete, so mind becomes less and less actively involved; the nerve path—if it might so be called—becomes organically established and the action automatic. So that we may consider that in the nervous centre of any envelope folder (to adhere to the same illustration for simplicity's sake) the movements of the hands required to fold an envelope are represented by a definite collection or series of cells, which, when suitably stimulated, will always produce the same definite and known group of movements.

An exactly similar condition may be argued to hold good in the case of mental processes, even in those that are most intricate. Acts of mind that are, in the first instance, originated by distinct volition, and attended by consciousness, may become at length to be performed quite automatically and without any conscious intervention. From frequent repetition they become organically registered; are physically represented in the anatomical structure of the brain, and, in all their connections and modes of action, are exactly to be compared with those so called secondary reflex acts of which mention has just been made. In this manner—as will hereafter be shown—ideas come under automatic influences; involved processes of thought exercise their power, after a while, with no evidence of consciousness; whole methods of reasoning and elaborate bases for judgment become organically registered in the brain, and are used in further activities of the mind in a manner exactly similar to that displayed by ordinary acquired reflex acts. Memory depends merely upon the organic stability of certain facts and items of knowledge and experience, and intellectual growth or development is dependent for its progress or stagnation upon the organic perfection and structural completeness of the brain itself. Every idea, every definite thought, every distinct mental process, every item of knowledge or experience may be considered to have its proper or organic representative in some portion of the brain; so that we may in

imagination conceive that it would be possible to place a probe point upon some certain cell or cells within the brain, and say "here is represented this or that idea, this or that detail of knowledge, this or that process of mind;" and conceive that a suitable stimulation of those structures would call into active being the thought, idea, or mental process that they organically represent, and that their destruction would be followed by a loss of all appreciation of those processes, and by a total cessation of their activity.

An object, for example, of peculiar conformation, such as an irregular piece of stone, is brought before the notice of an individual. The details of its form and peculiarities are carried to his nerve centres by, it may be, the myriad centripetal fibres that are called into activity in the estimation of form. It is either, we will suppose, minutely and attentively examined at once, or is brought before the notice with great and deliberate frequency. In either case, by repetition of the stimulus, and frequent reproduction of its effect, the mental process whereby that piece of stone is recognised as of a certain shape becomes organically represented in the brain; the appreciation of its details, which was at first affected by conscious effort and active agency of mind, is at length produced with no implication of consciousness; and, as common language would have it, the object becomes "known" or "familiar," its details are "remembered," and its peculiarities "impressed upon the mind." Is any apparent consciousness involved in recalling the shape and aspect of a primrose? Is not the very mention of the name alone sufficient to bring the figure of the flower instantaneously before the mind? The particle of mental energy whereby a primrose is "known" has an organic foundation in the brain, and the stimulus required to revive that knowledge (or in other words to reproduce the effect it originally established) expends itself with no more call upon consciousness than is evoked by the stimulus required for the display of some ordinary reflex action in the motor system. If the organisation of the knowledge of this selected piece of stone be imperfect, a mental effort will be needed to recall its configuration to the mind, just as mental interference is required to guide those muscular movements that have but recently been acquired and so but flimsily organised. But if, on the other hand, familiarity has made that knowledge perfect, the figure would rise up,

as one would almost say, spontaneously, when the suitable stimulus is in action.

As before stated, perfection of memory depends upon the completeness with which the detail to be remembered is anatomically stored up and incorporated in the brain; and this fact is well illustrated by the mental state that is observed in cases of senile decay, and in some instances of brain disease, such as are afforded by certain varieties of insanity. The old man, whose mental and bodily powers are rapidly failing and breaking-up, and who sits propped up in his arm chair by the fire side, a more or less passive mass of structural decay, will not infrequently be enabled to recall events and details that occurred many years ago in the earlier periods of his career, while, at the same time, his memory of passing events, of circumstances but of yesterday, will be almost *nil*. He will be able to give accurate details of some important and striking incident in his early youth; but he will be at a loss to say what befell him but a day or so ago, and while rejoicing in those recollections that are the crown of "oldest inhabitants," will prove but a sorry authority on the things that be. The reason appears to be this—the incidents of his younger days have been recalled perhaps over and over again during succeeding periods of his life, and have consequently become so firmly and efficiently organised in his brain, that the recollection of them is almost automatic; but his mental faculties are now declining, organic activity is almost at a standstill, and as a consequence the power of organically registering fresh mental processes is either extremely slight or positively wanting. The nutritive power of the whole body is feeble or degenerate and incapable of displaying fresh acquirements, so that the incident of yesterday may impress the mind for the moment, but it arouses no structural activity, it acquires no definite organic status, and the event is so far obliterated and the remembrance of it lost. The same condition of memory may be observed, and often in even a more marked degree, in the disease known as general paralysis of the insane.*

(To be continued.)

* Paper by author in "Journal of Psychological Medicine," October, 1876.

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