

ART. VII.—*The Expression of the Emotions in Man and Animals.* By CHARLES DARWIN, M.A., F.R.S., &c. With Photographic and other Illustrations. London: 1872.

MR. DARWIN has added another volume of amusing stories and grotesque illustrations to the remarkable series of works already devoted to the exposition and defence of the evolutionary hypothesis. Few, however, except faithful disciples will regard this new work as contributing much either to the author's fame, the scientific treatment of expression, or the support of the general theory. For ourselves, we must confess to having risen from its perusal with a feeling of the profoundest disappointment. Knowing the point to which Sir Charles Bell's admirable essay had carried the exposition of the subject, and finding from Mr. Darwin's introduction that he had given special attention to it for upwards of thirty years, we naturally expected that the volume would throw some fresh light on the philosophy of expression. This anticipation has not been realised. Of course the work contains a number of the careful observations, ingenious reflections, and faithful analogies with which Mr. Darwin's writings abound. But with regard to the interpretation of expression in men or animals, there is no advance on previous inquiries; while in relation to the most important branch, human expression, the exposition is positively retrograde, sinking far below the high level already reached. In his zeal for his favourite theory, Mr. Darwin seems to regard the nobler and more distinguishing human emotions with a curious kind of jealousy, as though they had no right to scientific recognition. He dwells at large only on the lower and more animal aspects and elements of emotion, and seems at times almost unwilling to admit that an expression is human at all, unless he can verify its existence in some of the lower animals. His one-sided devotion to an *à priori* scheme of interpretation seems thus steadily tending to impair the author's hitherto unrivalled powers as an observer.

However this may be, most impartial critics will, we think, admit that there is a marked falling-off both in philosophical tone and scientific interest in the works produced since Mr. Darwin committed himself to the crude metaphysical conception so largely associated with his name. The 'Origin of Species' contained a number of typical facts carefully selected, admirably described, and skilfully marshalled in support of the general argument. The tone of the exposition was moreover cautious, sober, and perfectly candid. No attempt

was made to disguise the partial and provisional nature of the results arrived at. The conception of gradual evolution by means of natural selection was stated as an hypothesis towards which many facts seem to point, but which in the present state of our knowledge could not be positively verified. In 'The Descent of Man,' while the relevant facts were far fewer, and the gaps in the evidence wider and more serious, the tone of the reasoning founded on them was confident even to dogmatism. In the present work, especially in the earlier or animal part, the facts, even when well established, are vague and ambiguous, while many of the more important are doubtful and disputed. A large proportion of them would indeed suit almost any other hypothesis quite as well as Mr. Darwin's, and many directly suggest a counter theory. Yet on the strength of this obscure and uncertain evidence Mr. Darwin claims to have established his general conclusion by even an excess of proof.

This significant result naturally suggests many reflections. Amongst others it raises the question as to the influence which the wholesale importation of hypotheses into many of its branches has had upon the development of modern science, and in particular the manner in which the leading hypothesis of evolution has affected the recent progress of the science of natural history. It has undoubtedly influenced very largely their whole spirit and procedure. During the last fifteen years not only have special branches been revolutionised, but science itself—the very conception of what is scientific—appears to have undergone a very serious change. Instead of designating what is most rigorous, exact, and assured in human knowledge, natural science is fast becoming identified with what is most fluctuating, hypothetical, and uncertain in current opinion and belief. It is worth inquiring for a moment what amount of gain and loss is involved in the change, what are the relative advantages and disadvantages accruing to science from the disturbing element of speculative conjecture which the Darwin hypothesis has so largely introduced.

In the first place, there can be little doubt that the theory of evolution, like any large intellectual conception provisionally uniting widely sundered spheres of knowledge, may, under proper regulation, have a very salutary effect. If its true character be kept in view, the theory is likely to do good rather than harm. It will prompt inquiry after the links connecting various branches of science, and thus turn observation and research into wholly new directions. Under its influence attention will be fixed with interest and anticipation on the interspaces in the map of natural knowledge, which

would be neglected so long as the different provinces were held to be separate and independent kingdoms. In short, it would establish a sort of temporary federation between the different provinces of science, and thus suggest and encourage the prospect of their more intimate and lasting union. In this way such a conception helps to correct one of the most serious incidental evils connected with the rapid progress of science—the tendency to isolation and exclusiveness. It has long been a reproach against the votaries of physical research, that they are, as a rule, specialists, wise only in one, or at most one or two departments of inquiry, and thus taking a somewhat limited and one-sided view of nature's operations. The provinces of natural knowledge are too vast and varied to be mastered in detail by any single mind, and even accomplished students can at most have a first-hand acquaintance with comparatively few. With so many wide and prolific fields to cultivate, the division of labour becomes a necessity, and the ardent specialist, engrossed in his own work, is comparatively indifferent to other and more remote scenes of exertion. This absorption of mind in a single direction may be a secret of success in science, but it tends to narrow the vision to a particular area of inquiry and to give exaggerated importance to one class of results. The kind of knowledge with which the specialist is most familiar comes almost unconsciously to be regarded as the only kind of real knowledge, its phenomena being the typical facts and its generalisations the ultimate laws of nature. The ignorance of other subjects even by proficient in science, may thus be denser and more hopeless than in minds of lower culture and intelligence. As Dr. Lyon Playfair has recently said, in discussing the mutual relation of professional and liberal studies, 'the focusing of light upon a particular spot, while it brilliantly illuminates that spot, intensifies the darkness all around.' And the darkness is usually most impenetrable at points further removed from the specialist's own field of vision. Continually engaged in the study of sensuous facts and the working of material forces, he becomes relatively insensible to the phenomena and powers of the moral and spiritual universe. He not unnaturally comes to regard these mental realities as altogether imaginary or wholly unknown, denying that they can ever become objects of science, or indeed knowledge in the limited meaning he attaches to the term. With such inquirers the terms metaphysical and theological are convenient and compendious epithets for describing their special ignorances and favourite aversions. They look, indeed, with impatience and suspicion on all theories designed to give a speculative basis

to the different branches of science, and unite all lines of investigation into a totality or universum of knowledge.

The doctrine of evolution acts as a corrective to this separatist tendency of analytical inquiry. It expands the horizon of science, and illuminates a wider prospect. For the old notion of nature as an aggregate of independent parts it substitutes the larger and more vital conception of all being mutually related and constituting an organic whole. The old lines of rigid difference, the hard isolating boundaries, including ultimate distinctions of form and substance, melt away before the incessant ebb and flow, flux and reflux, of common elements and common forces. The same constituents are found in the mightiest orbs above us as in the dust beneath our feet, and the same processes are illustrated in the formation alike of a star, a gem, or a flower. Man himself occupies a subordinate place in a vast secular procession which has moved on through interminable ages in the past, and, like the shadowy train that startled Macbeth in the Witches' Cavern, stretches out to the crack of doom in the future. Such a conception has undoubtedly a power and dignity of its own that, apart from definite evidence, would make it almost irresistibly attractive to a certain order of minds. If it seems at first sight to aggrandise nature at the expense of man, the unwelcome impression is soon removed by perceiving that it virtually annihilates the distinction between them. In the same way its bearing upon the moral universe is purposely left obscure in the ambiguity as to whether it may ultimately tend to materialise spirit or spiritualise matter. Ardent and imaginative minds, enamoured of natural inquiry, will not hesitate at speculative difficulties of this kind, or inquire too curiously about the links of proof. They will be fascinated by the novelty and grandeur of a conception that seems to rend the veil in nature's temple and reveal her hidden mysteries; that avowedly gathers the scattered rays of knowledge into a focus for the purpose of illuminating the past, the present, and the possible; that regards geological ages as moments in the rhythmical evolution of universal life, and planetary systems as mere specks in the fathomless abyss of infinite being. Such an hypothesis appeals quite as strongly to the imagination and the emotions as it does to the judgment and the reason, and hence the danger of its premature acceptance and indiscriminate application. Excitable but untrained minds would eagerly welcome it, and through the open avenues of fancy and feeling it will gain access to numbers who cannot estimate its value and know nothing of the evidence

upon which it rests. Nay, where the passion for novelty is stronger than the power of scrutinising proofs and estimating impartially the force of reasoning, even earnest students of science may be led astray by hastily adopting the guidance of a grand conviction or belief instead of following the slower but surer road of experimental verification and inductive proof. The partial though still popular acceptance of the new doctrine will thus be likely to illustrate in its working the evils associated with outbursts of social and religious enthusiasm. It will operate as a disturbing force in science, introducing into its domain elements of confusion and perplexity from which it had hitherto been almost wholly free. And subjected to this newer influence science can no longer claim any immunity from the perils and difficulties besetting other and less positive branches of inquiry. In proportion to their rash adoption and indiscriminate use the new doctrines must produce injurious results both speculative and practical.

These evils are, indeed, already apparent in almost every department of inquiry. As we have seen, the theory of evolution supplies physical science with a speculative basis or philosophy which it sorely needed, and with a kind of religion as well. At least the grand cosmical conception gives a powerful emotional stimulus to a certain order of susceptible minds, which may be regarded as a species of inverted religious feeling. But what is thus gained in one direction is certainly lost in another. While giving to science a philosophy and religion, the great hypothesis has also brought with it all the vices usually associated with the more excited types of metaphysical and theological discussion. The intellectual evils thus introduced are exemplified in the writings of even the more eminent scientific men belonging to the evolutionist school. No doubt the hypothesis gives a breadth, vigour, and animation to the expositions of its best representatives, such as Tyndall and Huxley; but, at the same time, it infects their speculative reasoning and results with an element of vagueness and uncertainty which even the most confident tone and trenchant style cannot altogether conceal. Then, again, the polemical writings of the school abound with the strained emphasis, eager word-catching, the rhetorical denunciations and appeals which characterise the lower forms of religious controversy.

But the most serious result is the inroad which these imposing hypotheses are making on the method and language of science. With regard to the first point, Mr. Darwin himself leads the way in the virtual abandonment of the inductive

method. While nominally inductive, his procedure is really deductive, and deductive of the most unscientific and illogical kind. Mr. Darwin tells us that his favourite speculation has guided and influenced his scientific observations and reflections for upwards of thirty years. At length he propounds it avowedly as an hypothesis, the fragmentary and imperfect evidence deduced in its support being eked out with ingenious analogies and fanciful suggestions.. The hypothetical character of the speculation is fully admitted by the few eminent names in science who have given it a welcome. On the other hand, men as eminent as Mr. Darwin in his own department have strongly asserted that not one of the points essential to the establishment of the hypothesis is proved; in short, that as yet it has no really scientific evidence in its support. But in his recent works Mr. Darwin boldly employs the unverified hypothesis deductively to explain the origin and history of man, and interpret what is most characteristic in human expression. And he does this with all the confidence of a theological disputant applying some dogmatic assumption, such as universal depravity or satanic influence, or defending some sectarian symbol, such as Sacramental Efficacy or an Effectual Call. In this, it need hardly be said, Mr. Darwin completely abandons the true attitude of science, which is that of suspended judgment on points not yet proved.

Again, in attempting to establish his theory, Mr. Darwin violates the fundamental canons of scientific inquiry—Newton's celebrated laws, that in interpreting nature no causes are to be assumed except those which really exist, and are sufficient to produce the effect. Now, the power of spontaneous and systematic transmutation which Mr. Darwin's hypothesis assumes has not yet been shown to exist; the slight variations within fixed and narrow limits, which is all he demonstrates, being wholly insufficient to produce the enormous changes attributed to it. The fatal flaw is the absence of evidence as to the existence and working of the power which the theory assumes. The furthest line in the past along which science can travel fails to supply the needed links of proof. Not only the long historical period, but the immensely longer geological eras are silent on this vital point. The records of thousands and hundreds of thousands of years have been ransacked in vain for the needed evidence. When pressed with these difficulties, Mr. Darwin takes refuge in infinite time and unknown space, in the alleged imperfection of the geological record, and the assumed eons of animated nature that died and made no sign. Here, of course, he cannot be followed, and is at perfect liberty, there-

fore, to fabricate his imaginary proofs in any way, and to any extent he pleases. To cover this sort of retreat, or at least to afford ample room for this sort of indefinite appeal, Professor Tyndall formally claims free scope for the exercise of the imagination in science. He admits 'that, in more senses than one, Mr. Darwin has drawn heavily upon the scientific tolerance of his age. He has drawn heavily upon *time* in the development of his species; and he has drawn adventurously upon *matter*, in his theory of pangenesis.' But he boldly demands that in science the speculative faculty shall be free to wander into regions where the hope of certainty would seem to be entirely shut out. In other words, when a daring scientific speculator finds himself in difficulties—becomes bankrupt in facts—he must be allowed to draw upon the bank of fancy at will, with the assurance that his draft, if eyed with suspicion by older-established scientific firms, will be eagerly honoured by excited, credulous, and expectant novices.

The philosophy and psychology of the school are, to a large extent, infected with the same vice. While nominally experimental and inductive, they are really, to a characteristic extent, *à priori* and hypothetical. The system of Mr. Herbert Spencer, the chief philosophical exponent of evolution, is essentially deductive, its central propositions being assumed, and only illustrated by occasional but wholly insufficient references to experience. The psychology of the school, again, rests on an extreme and one-sided theory; and the spirit of observation, though largely cultivated, is still guided and controlled by the exigencies of the theory. One important point of the theory, for example, is, that we have no perception of externality and distance through the sense of sight; no direct and intuitive perception of these relations at all, indeed, the knowledge being arrived at in a roundabout and operose manner by means of our muscular and tactile experiences. The well-known facts of animal life—such as that of chickens catching flies without any previous experience, as soon as they leave the shell—directly contradict this view. The facts rest on the express observation and testimony of eminent naturalists, and they have recently been verified afresh in a series of thoroughly scientific and exhaustive experiments. But Professor Bain, in dealing with the objection, founded on the instinctive perception of the lower animals, virtually denies the fact. He maintains that there 'does not exist a body of careful and adequate observations on the early movements of animals.' Elsewhere he still more explicitly repudiates the testimony of naturalists on the point. 'It is likewise said that the chick

'recognises grains of corn at first sight, and can so direct its movements as to pick them up at once; being thus able to know the meaning of what it sees, to measure the distance of objects instinctively, and to graduate its movements to that of knowledge—all which is, in the present state of our acquaintance with the laws of mind, wholly incredible.' The last statement would be more accurately expressed in the paraphrase—'All which facts are on the theory the author has adopted wholly inadmissible.' In other words, the facts must be denied in the interest of the theory.

The same tendency to substitute speculation for proof is seen in the physiology as well as in the psychology of the school. Even so vigorous and independent a thinker as Dr. Maudesley cannot escape the prevalent rage for hypotheses. Indeed, he has a theory designed, perhaps almost unconsciously, to cover the free use of the speculative element in which he delights,—that the man of genius is independent of the slow inductive processes, and leaps at once to their results. Unfortunately, however, all scientific conjectures need verification; and it is only after this necessary process that the man of genius can be finally distinguished from the daring but wayward speculator. However this may be, Dr. Maudesley practically illustrates the license he claims for men of genius. Accustomed to the observation and treatment of mental diseases, and thus habituated to the psychological side of his science, he boldly resolves all bodily ailments into mental disorders. All disturbances in any part of the physical system—in the lungs or liver, the stomach or kidneys—may, according to him, be ultimately traced to a temporary loss of local memory. He asserts, indeed, that every organic element of the animal body is endowed with this mental power—the pittings of small-pox being due to the fact that the virus of this terrible disease has a peculiarly tenacious memory. Extremes meet, and the ultra-physical school, in its latest developments, tends to become more metaphysical than the metaphysicians. As previous speculators of the same school had made mind a function of the body, so their more advanced followers are rapidly making body a mere function of mind.

An evil almost equally great connected with this rapid and somewhat random development of extreme theories is the confusion of tongues, or rather of technical languages it has introduced. If any of the great masters of scientific expression belonging to the last generation could look into the writings of some of their successors, they would be aghast at the loose style and mongrel dialect which in many instances have taken



the place of their own purity, dignity, and precision of scientific statement. The chief confusion, so far as language is concerned, arises from the promiscuous use of terms appropriated respectively to body and mind, as though they meant exactly the same thing. No abuse could be more opposed to good taste and scientific accuracy. Physics and physiology have a definite and established language of their own, and so also have psychology and metaphysics. There are exact and appropriate terms for describing mental states and activities, and also for describing bodily states and activities, and the first rule of scientific clearness and precision is that they should be kept distinct. The new school, however—some deliberately, and others through the force of evil example—habitually confound the two series; the physiologists continually applying psychological terms to bodily elements and functions, and the psychologists employing physiological terms to describe mental states and operations. Mr. Darwin himself is a great offender in this respect. The very title of his ablest and best known work illustrates this confusion. ‘The Origin of Species by means of Natural Selection’ might be fairly paraphrased as ‘The Origin of Species by means of Blind Foresight, Hazardous Deliberation, and Necessary Choice.’ The phrase ‘necessary choice’ is the exact equivalent of ‘natural selection,’ and strictly interpreted it is simply a contradiction in terms. The very object of Mr. Darwin’s theory is to exclude the conception of intelligence, forecast, and design from the operations of nature, yet the most important term used in describing the theory has no distinctive meaning apart from mind. Almost any section of Mr. Darwin’s writings would furnish abundant instances of a like kind.

But this vice of confusion appears in a still more flagrant form in the writings of Dr. Maudesley. Not content with an occasional raid into the neighbouring province, Dr. Maudesley attempts to carry over the great body of psychological terms into physiology. He thus invests his purely physical expositions with a verbal haze or glamour of emotional, imaginative, and volitional language. The title of his chief work, ‘The Physiology of the Mind,’ indicates the kind of verbal confusion that infects its expositions. To harmonise with this feature of the work the more appropriate title would have been ‘The Psychology of the Body.’ The special sensations of the cerebral neurine are called by Dr. Maudesley emotions; the equilibrium of nervous power is latent thought, ‘mind statical,’ while the disturbance of this equilibrium is active thought, ‘mind dynamical.’ Then, again, the automatic response of animal tissue

to an external stimulus is, if active, perception; if latent, memory; and if irregular, we presume, imagination. If this sort of wholesale confounding of bodily elements and products with mental ones goes much further, we shall soon have young enterprising physiologists extending the dictum of Cabanis, and asserting that all the secretions of the body are thoughts, and all its excretions language, and discriminating the various excretions as different dialects of a common tongue.

On the other hand, Professor Bain, the psychologist of the school, largely adopts, if he did not introduce, the equally vicious plan of describing mental states and processes in physiological language. He continually drags in physical details and phrases, which simply disfigure the exposition without throwing any light on the mental facts to be explained. Professor Huxley attempts, it is true, to justify this inaccurate and misleading use of the language.

‘In itself,’ he says, ‘it is of little moment whether we express the phenomena of matter in terms of spirit, or the phenomena of spirit in terms of matter; matter may be regarded as a form of thought, thought may be regarded as a property of matter; each statement has a certain relative truth. But with a view to the progress of science, the materialistic terminology is in every way to be preferred. For it connects thought with the other phenomena of the universe, and suggests inquiry into the nature of those physical conditions, or concomitants of thought, which are more or less accessible to us; . . . whereas the alternative, or spiritualistic, terminology is utterly barren, and leads to nothing but obscurity and confusion of ideas.’

If we understand this passage, Professor Huxley appears to say that such terms as thought and feeling, volition and desire, are barren, if not confused and unintelligible, and ought therefore to be abandoned. But that to speak of glandular secretions, cerebral currents, ganglionic shocks, and molecular changes, instead of intelligence, emotion, and will, is perfectly comprehensible, and contributes to the advancement of knowledge. In other words, that in dealing with mental phenomena it is more scientific to speak of their physical conditions or correlatives, of which we are never conscious, and which are indeed unknown, than to speak of the phenomena themselves, which appear in the full light of internal perception, and constitute our most habitual and vivid experiences. Such an attempted defence is surely its own best refutation. If further refutation were needed, it is found in Professor Tyndall’s clear discrimination of the two provinces of inquiry, and his emphatic declaration that the fullest knowledge of the one does not throw any light upon the other. In his paper on ‘Scientific Ma-

‘terialism,’ he points out that the passage from the physics of the brain to the corresponding fact of consciousness is unthinkable. ‘Granted that a definite thought and a definite molecular action in the brain occur simultaneously, we do not possess the intellectual organ, nor apparently any rudiment of the organs which would enable us to pass, by a process of reasoning, from the one to the other. They appear together, but we do not know why.’ ‘In affirming that the growth of the body is mechanical, and that thought, as exercised by us, has its correlative in the physics of the brain, I think the position of the “Materialist” is stated, as far as that position is a tenable one. I do not think he is entitled to say that his molecular groupings and his molecular motions *explain* everything. In reality they explain nothing. The utmost he can affirm is the association of two classes of phenomena, of whose real bond of union he is in absolute ignorance.’ This is the language of science, which separates things that are distinct, and designates different sets of facts by significant and appropriate terms. And it cuts at the root of the confusion both of thought and language, which is so characteristic a feature of the school. It is due to Mr. John Stuart Mill to say that he is never guilty of this inexact and misleading use of language. He always describes mental facts in psychological terms, and physical facts in physical terms; and this is, of course, the only scientific method. The reverse of the process, however plausibly disguised or ingeniously defended, is in reality absurd. It would be quite as rational to talk of dissecting an emotion or preserving an idea in spirit, as to talk of consciously associating molecular currents, feeling the logical connexion between two nerve shocks, or realising by internal perception the production of phosphorus in the brain. We fear, however, that the sounder precept of Professor Tyndall, and the higher example of Mr. Mill, will be lost on the more advanced evolutionists. Mr. Mill is, indeed, already regarded by the new school as somewhat out of date; his philosophy with them is becoming antiquated. His purer taste and more accurate style are hardly likely, therefore, to have much influence on young Darwinians revelling in all the looseness of vast but unverified generalisations, and clothing their crudities of thought in the grotesque confusion of a Babylonish dialect.

The practical influence of the new doctrine is seen in the rise and rapid growth of a pseudo-scientific sect,—the sect of the Darwinian evolutionists. This sect is largely recruited from the crowd of facile minds ever ready to follow the newest

fashion in art or science, in social or religious life, as accidents of association or influence may determine. No doubt, as already intimated, some of the more susceptible minds may have been attracted not only by the novelty and notoriety, but by the grandeur and power, the secular sweep and material sublimity, of the hypothesis itself. But the majority are probably influenced by more mixed and superficial motives. Amongst these is the exhilarating sense of freedom and independence in adopting advanced views, and the piquant feeling of conscious power in urging them against the alarmed remonstrances of acquaintances and friends. It is pleasant to ride as it were on the crest of the largest advancing wave of scientific speculation, and lay the flattering unction to your soul that you share its pre-eminence, and are part of the power that urges it forward. Unfortunately these new doctrines afford ample scope for this seductive species of self-glorification. The most striking points in the theory of evolution, as well as in its application, are precisely of the kind most readily apprehended by ordinary minds. That 'we were once tadpoles you know;' that men are descended from monkeys, and that 'moths and butterflies flirt 'with each other as we do' are propositions requiring no great strength of intellect to grasp or to expound in a lively conversational way. This kind of colloquial acquaintance with these advanced theories is not unfrequently mistaken for a knowledge of natural science; and in many circles, especially in certain sections of London society, fluent conversational evolutionists are to be found whose literary culture hardly goes deeper than a slight knowledge of Mr. Swinburne's poetry, and whose scientific and philosophical training is restricted to a desultory acquaintance with some of Mr. Darwin's more popular works. But whatever may have been the special influences in the case of individual converts, the majority agree in being evolutionists through feeling and fancy rather than through knowledge and insight. They thus exemplify the moral and emotional phenomena connected with temporary accesses of social and religious excitement. Their enthusiasm is for the most part unembarrassed by definite knowledge, and their zeal, like that of recent converts in general, has a tendency to outrun discretion.

One note of similarity between the Darwinian evolutionists and the more active religious sects, is to be found in the common element of strong but unenlightened belief on which they both so largely depend. The evidence in favour of the central Darwinian doctrine is notoriously deficient, but this is no hindrance to its enthusiastic acceptance. Ardent neophytes easily

personify the principle of evolution, and clothe it in imagination with all the powers necessary for the production of its reputed effects. They trust its working where they cannot trace it, and are content to walk by faith, not by sight. On all doubtful points their subjective conviction is so strong as to be independent of objective verification or outward proof of any kind. The external evidence that men are descended from monkeys, for example, is almost wholly wanting; but happily, in the case of docile converts, it is also needless. Difficulties equally serious are removed by the unquestioning faith which is the evidence of things not seen, the substance or assurance of all that is eagerly desired. The cavils of sceptics are of no avail with the true evolutionist believer, because he has an unfaltering trust in his own sacred books and inspired writers. At their bidding he is ready to adopt not only things unsupported by reason, things above and beyond reason, but things directly opposed to all reason, all probability, and all experience. The new school, indeed, virtually adopts as its own the more extreme and irrational maxims belonging to the darkest period of religious belief. Thus Dr. Maudesley, referring to the physical miracles which disciples are called upon to accept, says expressly: 'In such matters it would be more wise to adopt Tertullian's maxim, "Credo quia impossibile est," than that which is so much favoured by the conceit of human ignorance—that a thing is impossible because it appears to be inconceivable.'

Another note of sectarianism in the evolutionists is their tendency to intolerance. This tendency is manifested, perhaps, in its extremest form amongst the rank and file of the sect. It displays itself, however, in various shapes, some of which are amusing enough. Sometimes it appears in the eager denunciation of opposing views, the impatience of all adverse criticism, and the bringing against opponents hasty charges of blindness and obstinacy, ignorance and prejudice, servility, corruption, or fear. At other times the latent spirit of intolerance assumes the garb of missionary zeal, appearing in the tacit assumption that all who are not Darwinians are in a benighted and miserable condition. This zeal often extends to an affectionate solicitude as to the mental state of the undecided. It may then find expression in the inquiries, 'Are you yet a Darwinian?' 'Has the great doctrine of evolution been revealed to you?' 'Has the day-spring of chaos, necessity, and chance dawned upon you, or are you still groping in the outer darkness of creation, intelligence, and design?'

These anxious inquirers combine with their missionary zeal for the unconverted a sectarian keenness of scent for heresy. Any reference to soul or mind, to rational order, foresight, or adaptation, they regard with instinctive suspicion; while all such conceptions as moral order, ordained purpose, formal or final causes in nature, are promptly repudiated as mere remnants of ancient and outworn superstitions. The missionary efforts of the sect are, in fact, a kind of ludicrous travesty of the acts and artifices of sectarian aggressiveness and self-assertion. This tendency to intolerance appears also in the writings of the school, especially in the less distinguished. The tone of the discussion in many cases involves the tacit assumption that the evolutionists are the only wise men, and wisdom itself will die with them. This feature comes strongly out in the journals of the school in the free use of such terms as 'exploded' and 'extinct' applied to all opposing theories and rival views. Nor are the writings of the leaders altogether free from this taint of intolerance. Even Mr. Darwin's courtesy and candour partake in a measure of the same spirit. In the present volume his casual references to other principles of interpretation than his own, though strictly polite, indicate clearly enough that in the writer's opinion they are irrational and absurd. This method of treating opponents, though vastly superior to that of Papal denunciation, rests on the same assumption of infallibility, the same summary rejection of all rival views, as the more violent anathemas of the Sovereign Pontiff. The same spirit is traceable in the writings of Professor Huxley, perhaps the acutest thinker and most variously accomplished man belonging to the school. It is impossible, however, to read his replies to opponents without feeling that they breathe a spirit of latent intolerance, and are tinged with sectarian bitterness. In certain passages of his writings he rises to a pitch of prophetic denunciation, and tells his opponents that they are doomed to speedy extinction by the nature of things, and will soon be swept from the universe. This extreme tone is probably due in part to the fact that Professor Huxley has accepted the principle of evolution more absolutely than any other man of science except Mr. Darwin himself, and that consequently he represents what may be called its religious spirit in the most concentrated form, and partly also to the fact that his nature is essentially Puritanic, if not Calvinistic. He has the moral earnestness, the volitional energy, the absolute confidence in his own convictions, the desire and determination to impress them upon all mankind, which are

the essential marks of Puritan character. His whole temper and spirit is essentially dogmatic of the Presbyterian or Independent type, and he might fairly be described as a Roundhead who had lost his faith. He himself shows the truest instinct of this in calling his republished essays 'Lay Sermons.' They abound, in fact, with the hortatory passages, the solemn personal experiences, the heart-searchings and earnest appeals that are found in Puritan literature. The hypothesis of evolution thus met a real and vital want in his nature, and he espoused it with a crusading zeal and insistence surprising enough to less ardent minds. In perfect harmony with this feature of his character, Professor Huxley has been known to express a strong desire for a scientific hell, to which the finally impenitent, those who persist in rejecting the new physical gospel, might be condemned. In a lower degree, and in less noble forms, the same spirit of intolerance is, however, manifested by all the more energetic members of the new school.

A final note of sectarianism in the evolutionists is what may be called their illiterateness, or at least their comparative indifference to every culture or cultus except their own. This feature is closely connected with the last—the spirit of latent intolerance—and may perhaps be regarded as one of its special manifestations. Just as religious sectaries think merely their own thoughts, read none but their own books, and are exclusively interested in the activities of their own little world, so genuine evolutionists appear to have no interest in any subjects except natural history and anthropology. They repudiate all inquiries that have no direct or perceptible bearing on these central objects of pursuit. From this point of view they stigmatise literature and philosophy as vain, if not frivolous, pursuits. The greatest poets—Homer, Virgil, Dante, and Shakspeare—are passed by as mere 'fiddlers,' while metaphysicians and theologians are denounced as word-jugglers dealing in idle abstractions and fictitious entities. Even history and travels have in their view a very secondary and indirect value, as helping to throw occasional light on the physical condition of savage tribes or the material fragments of ancient culture. As a rule, therefore, the evolutionists have little or no knowledge of literature, philosophy, or history. The faithful Darwinian, like the faithful Mussulman, judges the accumulated stores of human knowledge from the point of view of his particular faith, and would deal with them as the Calif Omir did with the Alexandrian library. If other works contain only what is found in Mr. Darwin, they are superfluous

and need not be kept; if they contain anything different, anything opposed to Mr. Darwin, they are injurious, and ought to be destroyed. The old idea of catholic training, of a varied and vigorous culture fitted to develop and strengthen all the powers of the mind, is in this way so completely lost that the evolutionist's conception of education appears hardly to go beyond the teaching of physiology and natural history under Darwinian conditions. Amidst the various and conflicting notions of liberal education that are now distracting public attention, there could hardly perhaps be found a lower depth than this.

The founder himself shares to a large extent in this central characteristic of the school; and here we are brought face to face with a vital defect in the volume before us—a defect that goes far to undermine its leading principles, and vitiate some of its most prominent conclusions. It has long been a reproach against Mr. Darwin that while he extends the most ample and flattering recognition to those of his own way of thinking, his associates and disciples, he rarely refers to even the highest authorities who happen to differ from him, and then only in the most indirect and sparing manner. So long as Mr. Darwin confined himself to his own subject, this procedure, though a sign of partiality, was of comparatively little consequence, his own knowledge being so complete as to make him virtually independent of others. But in 'The Descent of Man,' and in the present work, the author is immediately concerned not only with bodily structure and functions, but with mental powers and products. He is dealing so directly with psychological elements and principles that the force of his reasoning and the value of his conclusions must depend altogether on his mastery of the facts and laws of mind. This difficult branch of investigation has been systematically cultivated by a series of thinkers whose names are as illustrious as any connected with the advancement of science. As the result of their labours, a vast body of elementary facts and illuminating principles have been gradually accumulated, and moulded into scientific shape, the different steps of the process making important stages in the history of philosophy. But Mr. Darwin shows no sign of being acquainted with any of the great thinkers whose researches and discoveries constitute eras in the progress of mental science. The only preparation he seems to have thought necessary before assuming the responsible position of an independent authority on the subject is of the most elementary and superficial kind. So far as the evidence goes, Mr. Darwin's philosophical knowledge is exclu-



sively derived from Mr. Herbert Spencer and Professor Bain. He appears to have dipped into the system of the one, and kept at hand for ready reference the students' manuals produced by the other. Now, these writers—each justly eminent in his own way—notoriously belong to extreme and one-sided schools. But Mr. Darwin never seems to have enlarged his knowledge of philosophy, to have extended his reading in any other direction, so as to be able to correct and modify the partial statements of his chosen guides. He is never wise above what they have written, and seems to have only an imperfect acquaintance even with this very limited section of philosophical literature. Yet on the strength of this elementary and one-sided knowledge he boldly undertakes to discuss and settle the most difficult and complex problems of mental science. In any other department of inquiry surely such a procedure would be justly considered as in the highest degree reprehensible. No amount of eminence in special departments of knowledge entitles a man to speak with authority on a subject he has not seriously studied and knows little or nothing about. And Mr. Darwin's sudden irruption into the domain of mental philosophy is as though a metaphysician who had merely dipped into Oken's 'Elements of Physiophilosophy' and Carpenter's 'Manual of Human Physiology' should, in virtue of such a smattering, set up as an independent authority on the subject, and boldly deny the conclusions of the most eminent physiologists of the time.

It is true that in terms Mr. Darwin is modest enough with regard to his pretensions. He virtually apologises for his limited knowledge of mental science; but the ground of the apology, if worth anything, ought to have been a disqualification for undertaking such a serious task as the evolution of reason and conscience from animal elements. Notwithstanding the modesty of his tone, nothing can be more presumptuous in spirit and substance—more arrogant, indeed, in its claims—than Mr. Darwin's argument. It necessarily presupposes a thorough knowledge of all psychological activities and products not only in themselves but in their mutual relations and complex development, since the exposition undertakes to enumerate, explain, and account for them all. Mr. Darwin expressly claims to trace the origin, growth, and progress of the elements of mind from the earliest and most obscure motions of sense up to the highest manifestations of intelligence, freedom, and responsibility. His very enumeration of these elements is, however, like the furniture in the poor apothecary's shop—little more than 'a beggarly account of

‘empty boxes.’ The higher faculties, which present the most serious obstacles to the application of his theory, and are indeed fatal to its larger claims, Mr. Darwin omits altogether. He does this avowedly, on the ground that hardly any two authors agree in their accounts of these powers, his minute and comprehensive historical knowledge of the subject enabling him to indulge in such sweeping assertions. The assertion is of course not true; and supposing it were true, it would not relieve Mr. Darwin from the necessity of discussing such inconvenient questions as self-consciousness, discourse of reason, and personal identity. However hardly they may press upon his particular theory, these elements of our mental life exist, and have therefore to be accounted for. And for the exponent of the theory to shrink from the crucial test is a virtual admission that it is insufficient for the purposes to which it is nominally applied. At the outset, therefore, the facts to be explained are only partially considered, the most important being omitted. And the reasoning based on these facts is weaker and more irrelevant than anything to be found in the whole compass of Mr. Darwin’s writings. It stumbles on the threshold, and is marked throughout by illegitimate assumptions and circular reasonings of the most flagrant kind. It illustrates at every point, indeed, the well-known fact, that when those who have been long devoted to minute external observation, and thus accustomed to follow step by step the limited and lower but safe guidance of inductive lights once abandon the familiar path, they wander far more widely and hopelessly than others whose mental training and activities have been less exclusive. After hugging closely for half a century the shore of material fact, navigation in the open sea of thought becomes difficult and hazardous, especially to those unacquainted with the compass and chart of speculative reason, and unaccustomed to rule their course by the higher lights in the hemisphere of experience—the lode-stars of rational but severely regulated thought. Many wonder how it is that Mr. Darwin, being so supreme in the observation, description, and arrangement of material facts should be so inferior in dealing with moral facts and reasons, so weak logically, so inconsequent and inconclusive in the region of abstract speculation and reflective proof. The explanation is in part supplied by the circumstance just adverted to, that he made the acquaintance of philosophical reasoning too late in life, if this may be said without offence; and partly also by the fact we have specially noted, that, from his absorption of mind in his own subject, he

has failed to acquaint himself with the higher province of inquiry into which he has somewhat rashly ventured.

The present volume supplies fresh evidence that Mr. Darwin's ignorance of mental science is real and not assumed. It appears from the very manner in which he uses the authors on which he exclusively relies for such information as he possesses. As his previous work, to be at all effective or complete, required a minute acquaintance with man's intellectual and moral nature, so the first condition of success in his present undertaking is a thorough knowledge of the passions, affections, and emotions. We naturally expect, therefore, at the outset to find some discrimination of the special sensibilities which find expression in the countenance and gesture of men and animals. At least we look for some explanation of what is included under emotion, as well as some classification of the distinctively human emotions. Instead of this all we find is a short quotation from Mr. Herbert Spencer on an initial point that belongs to the common-place of the subject. 'Mr. Herbert Spencer,' says Mr. Darwin, 'has drawn a clear distinction between emotions and sensations, the latter being generated in our corporeal framework. He classes as feelings both emotions and sensations.' But this is an elementary distinction taken by others long before Mr. Spencer, and more fully developed and applied than by him. Thus, to refer only to an established and easily accessible authority, we find in the 'Encyclopædia Britannica' the following:—'It is convenient to lay down at once the broadest of the objective distinctions separating the kinds of feeling. A sensation is a feeling whose excitant is a phenomenon of the body; an emotion is a feeling whose excitant is a phenomenon of the mind or consciousness of the subject.' And again a little later:—'There has been already stated the distribution of feelings into sensations and emotions, distinguishable by the character of their antecedents or excitants, these being respectively phenomena of the bodily organs of the subject, or of its consciousness.' A writer familiar with the subject would indeed have assumed the distinction as common-place, without feeling it necessary to quote any authority in support of it. Mr. Darwin might almost as well have announced that Mr. Herbert Spencer, the great exponent of the principle of evolution, had made the important and original remark that 'bodily pain is different from mental suffering, and that bruised muscles may be discriminated from lacerated feelings.' Again, in dealing with the physical effects of fear, one well-known symptom referred to is the partial paralysis of the salivary glands. In illustration of this Mr.

Darwin quotes his chief psychological authority:—‘ Mr. Bain explains in the following manner the origin of the custom of subjecting criminals in India to the ordeal of the morsel of rice: “ The accused is made to take a mouthful of rice, and after a little time to throw it out. If the morsel is quite dry the party is believed to be guilty, his own evil conscience operating to paralyse the salivating organs.”’ Here both the fact and the cause of it as are old as the hills, or at least so familiar that they might be at once assumed without any special authority. In a manual published upwards of thirty years ago both are stated, indeed, as notorious truisms. ‘ Everybody knows the almost instantaneous effect of fear in blanching the cheeks, and rendering the eye dull, as well as that of any intense emotion in occasioning an immediate suppression of various secretions, such as tears and saliva. The cleaving of the tongue to the mouth from violent emotion—the *vox hæret faucibus*—is easily explicable upon the same principles. Everybody knows the story of the detection of a thief, in an establishment of servants, by the dryness of the rice which he, in common with the rest, had been compelled to hold in his mouth, while each was taxed with the theft.’ Here, again, Mr. Darwin might almost as well have quoted the same authority in support of any familiar fact—might have said, for instance, Professor Bain has acutely remarked that a bitter taste produces wryness and contortion of the mouth, just as a bad smell operates most energetically upon the muscles of the nose.

But we must pass on to notice Mr. Darwin’s method of dealing with the facts of expression, and the principles he lays down for their interpretation. His method of arriving at the facts of human emotion is so characteristic that it well deserves a word or two of special comment. It indicates the presence and active working of a strong preconception in the author’s mind. Mr. Darwin tells us that the principle of evolution had occurred to him upwards of thirty years ago, and that he has observed the phenomena of expression at intervals ever since, in order mainly, as it would seem, to find illustrations in confirmation of the principle. But parental attachment to a new principle may be just as disturbing an element in the way of unbiassed observation as partiality for any established method. And it is impossible to read far in the present volume without feeling that the facts have been selected, arranged, and interpreted according to the exigencies of the new theory rather than according to their actual character and the results they spontaneously afford. There is an obvious effort from the first to bring vividly into

view not what is most distinctive in the expression of human emotion, but what is common to men and animals. The aim all through is to stretch this common element in every conceivable way, and make it appear as large as possible. For this purpose the higher human emotions are not dealt with at all, or, if incidentally noticed, are at once dismissed as artificial, conventional, and the like. As in 'The Descent of Man' the higher mental powers, being inconvenient, were passed over, so in the interpretation of expression the nobler emotions are treated in the same way, and for the same reason. For the same purpose the very limited expressive element in the countenances and gesture of animals is habitually overstated, while the enormously higher power of expression possessed by man is systematically understated. In relation to the first point, the extent to which Mr. Darwin persistently reads his own theory into the ambiguous muscular twitches and spasms of monkeys and other animals is often amusing in a high degree. The manner in which he continually degrades and vulgarises human emotion is equally striking.

But the method of arriving at the facts to be explained shows the working of the same mental preoccupation in a still stronger and more obtrusive form. Mr. Darwin describes minutely the plan he adopted in order to acquire as good a foundation as possible, and ascertain how far particular movements of the features and gestures are really expressive of certain states of mind. The plan consists in obtaining observations from six different sources. These are, first, infants, because they exhibit many emotions with extraordinary force; second, the insane, as they are liable to the strongest passions, and give uncontrolled vent to them; third, galvanism—that is, muscles artificially excited by means of galvanic action; fourth, art, the great masters in painting and sculpture; fifth, ruder and more savage races; sixth, the lower animals. To this last source Mr. Darwin naturally attaches a 'paramount importance,' as affording 'the safest basis for generalisation on the causes or 'origin of the various movements of expression.' Now, if the six sources are examined, it will be seen that from only one of them—the fourth—could any knowledge of the higher and more complex human emotions be derived. And, curiously enough, this is precisely the one from which Mr. Darwin confesses that he obtained little or nothing suitable to his purpose. The five other sources could illustrate at best only the simpler, ruder, and more violent forms of passion. The higher emotions are associated with the activity of reason, are indeed the reflex or developed intelligence. But in infants reason is wholly un-

developed, mere animal appetites and passions having the supremacy. In the case of the insane reason is dethroned, and while they are liable to uncontrolled outbreaks of passion, the passion is necessarily of an irrational and violent kind. Savages, again, are the infants of the race, and the emotions manifested by them will, as a rule, be of a coarse and rudimentary kind. This is still more true of the lower animals. It may be questioned, indeed, whether they have emotions at all in the stricter meaning of the term—whether they are not always moved by bodily appetites, passions, and desires, rather than by purely mental causes and antecedents. Then, again, galvanised muscle can exhibit at most only the harsher elements of expression, and that too in an isolated and extreme form. Nothing can more vividly illustrate this than the hideous portraits of the galvanised old man whose ‘skin was little ‘sensitive,’ which Mr. Darwin employs to illustrate his expositions. In these portraits all the varieties of facial expression are so repulsively unnatural that it is difficult to say which of them is the more unhuman—the grin, the frown, or the gasp. The violent distortion of isolated muscles altogether destroys the fine lines and shades of movement that are the life and soul of spontaneous expression. No wonder, therefore, that many of the illustrations could not be recognised or agreed upon as expressions of any distinctively human emotion.

The result is that from the sources to which Mr. Darwin exclusively refers for his facts, it is impossible to obtain illustrations of the higher and more characteristic human emotions. They are all, no doubt, of use in helping to throw light on the lower appetites and passions. But in studying emotion to restrict attention to such sources is a glaringly partial and one-sided procedure. It is obvious that no adequate knowledge of human expression can be gained from studying only the rude, undeveloped, and abnormal forms of humanity. If the facts of expression are to be dealt with as a whole, humanity must be studied not merely in its dwarfed, diseased, and arrested shapes, but in typical examples of varied faculty and developed power. Men of at least average endowment must be carefully observed under circumstances that call into free and varied play the higher as well as the lower powers of intelligence and sensibility, and especially in the critical moments that give concentrated and intense expression to conflicting desires, or reveal as by a flash of light the master passions of the mind. These are the moments of exultation and depression and especially the seasons of reverses, perils, and distress, the effect of which is so finely described by Lucretius:—

‘Quo magis in dubiis hominem spectare periculis  
 Convenit adversisque in rebus noscere qui sit ;  
 Nam veræ voces tum demum pectore ab imo  
 Eliciuntur ; et eripitur persona, manet res.’

At such seasons the mask is torn away, and the man remains ; all disguises of conventional expression disappear, and the realities of life, the innermost feelings and desires, are revealed in their naked depth, truthfulness, and power.

Now, apart from long and minute personal observation, the only way of carrying on this study is by means of literature and art—in the pages of great poets and prose writers, and the works of the masters of painting and sculpture. The writings of the more eminent authors, who have been careful observers of human nature, and had the profoundest insight into the mysteries of human passion, abound with admirable touches and truthful descriptions of expression. Mr. Darwin, it is true, does not include literature amongst the sources from whence information on the subject may be derived, but he avails himself of it in the body of the work. Happily in this respect, his practice is wider than his precept, or his exposition would be more imperfect than it is. But although he has derived a few graphic delineations from novelists and poets, especially from Shakspeare, this rich vein of illustration is left comparatively unworked. This has mainly arisen from the circumstance that great poets delight to exemplify the higher and nobler aspects of emotion which Mr. Darwin, as a rule, neglects. Had he taken anything like an adequate view of the higher ranges of expression, the illustrative quotations from Shakspeare alone might have been multiplied ten-fold. Then, again, the more intense, susceptible, and keenly observant modern poets, such as Shelley, abound with vivid images of the darker passions, as well as with exquisite descriptions of the kindled and exalted gestures in which the nobler feelings and desires find expression. This, indeed, is what we should naturally expect to find. It is the very nature of the poet that, being richly endowed with sensibility himself, he should be keenly alive to its manifestations in others, discriminating with quick intuitive precision even the more subtle, delicate, and evanescent forms of emotion. Many writers of imaginative prose, too, are gifted with such a spirit of minute observation that their pictures of human nature possess a kind of photographic truth, distinctness, and reality. This is especially true of the more eminent female novelists, who have a rare power of making emotion visible by its external signs, as well as audible by its impassioned utterances. Such women, being endowed

with keen and delicate sensibility, have an extraordinary power of detecting varying shades of expression, and an intuitive perception of their meaning, amounting almost to divination. Mr. Darwin has derived a few illustrations from this source, but they might with advantage have been greatly multiplied. Indeed, from the works of George Eliot alone there might easily be selected felicitous descriptive touches embracing almost every kind of human emotion and desire.

What is thus true of literature is still more true of art, the main business of great painters and sculptors being to study and portray the more characteristic types of human nature, the more impressive and affecting manifestations of human emotion. The great artists have profoundly studied the play of human feeling, have carefully observed the indications of passion and affection, for the express purpose of permanently recording them in eloquent light and shadow, in living lines and colours, or in breathing bronze and marble. Their works accordingly are the great store-house of materials for illustrating the entire range of human gesture and expression. This was so fully recognised by Sir Charles Bell, that he entitled his great work 'The Anatomy and Philosophy of Expression in connexion with the Fine Arts.' Yet from this prolific source Mr. Darwin has not, we believe, derived a single illustration. Nay, as we have seen, he even asserts that, after examining copies of the well-known works of the great painters and sculptors, he found little or nothing suitable to his purpose. We venture to think that with unbiassed judges acquainted with the subject this will be a sufficient condemnation of that purpose, will sufficiently indicate that from the very outset Mr. Darwin has not attempted to consider the whole subject of human emotion, but only those parts of it which could be readily connected with the manifestations of brute instincts, of animal appetites and desires.

In this point of view it is instructive to compare Mr. Darwin's treatise with that just referred to—Sir Charles Bell's classical exposition of the philosophy of expression. In all vital points of conception and treatment, indeed, no contrast could be more striking than that presented by the two works, or, we need scarcely add, more strikingly in favour of 'The Philosophy of Expression in connexion with the Fine Arts.' Sir Charles Bell, it is true, deals largely with expression in animals as well as in man; but he does not, like Mr. Darwin, invert the true proportions of the subject, by trying to assimilate what is highest in expression to what is meanest and lowest. He preserves in this, as in other respects, the truth,



modesty, and balance of nature. While he studied diligently the lower sources whence a knowledge of expression in its rudimentary forms may be derived, he did not neglect the higher sources, the fullest consideration of which must crown any adequate exposition of the subject. Then, with regard to style and treatment, Sir Charles Bell was not more decisively Mr. Darwin's superior as an anatomist and physiologist than as a man of taste and of literary and philosophical culture. His style is marked by the rarest union of gracefulness and strength, of purity, precision, and admirably co-ordinated scientific and literary power. On the other hand, Mr. Darwin's writing is marked by slang phrases, vulgarisms, and a pervading looseness of structure that, apart from the interest of the subject, would often make the mere reading a wearisome task. We only wish there were space at command to exemplify Sir Charles Bell's immense superiority in this respect. But all who are familiar with his essay will remember how happily it illustrates the higher culture that illuminates special knowledge, connects science with history and philosophy, and thus gives to its expositions a distinctively literary character, and a broadly human interest. The author's varied, rich, and refined training as a thinker and critic appears in every part, not only in the style, but in the finished accuracy, fulness, and plastic grouping of the details, in the firm and flexible command of general principles, and in the rare beauty of the illustrations, both literary and artistic. The literary illustrations are so numerous indeed that the more eminent poets, belonging to almost all the great periods of literature—Homer, Virgil, and Ovid; Dante, Petrarch, and Tasso; Spenser, Shakespeare, and Milton—are laid under contribution for felicitous descriptive touches or more elaborate but exquisitely delicate and truthful illustrations of expression.

But the respective relation or attitude of the two writers towards art brings out the vital difference of conception and treatment in the most striking form. Mr. Darwin apparently knows nothing of art, and certainly has no perception of its intimate relation to the subject he undertakes to expound. As we have seen, he professes to have looked into the masterpieces of the great European painters and sculptors **without discovering any important elements of expression in their works.** With Sir Charles Bell art is so vitally related to expression as to find a place in the very title of his work. Mr. Darwin's studies in art appear to have been restricted to looking over a few photographic copies of the works of great masters. Sir Charles Bell went to Italy for the express purpose of visiting its galleries

and studying the splendid monuments of painting and sculpture the country contains. Mr. Darwin has not a single illustration derived from art, no reference to the subject, indeed, except the passage in which he dismisses it from consideration. Sir Charles Bell's work abounds with the happiest illustrations derived from painting and sculpture. We may point to his descriptions of Guercino's *Departure of Hagar*, in the Gallery of Milan, of Raphael's *St. Cecilia*, of Guido's *Murder of the Innocents*, and of a *Pietà* by Michael Angelo as admirable examples. From his perfect knowledge of the sources of expression, moreover, Sir Charles Bell was in this way able not only to appreciate and employ for his own purposes the truthful delineations of the emotions by the great painters and sculptors; he was able to criticise their work, to detect the points where they failed accurately to represent the complexity or harmony of muscular movement involved in particular emotions, or sacrificed the consensus of expressive form and gesture to the imagined requirements of the composition. In general, however, his finely critical and scientific insight led him to vindicate afresh the wonderfully accurate rendering of emotion in gesture and expression which characterises the works of the great masters, both in painting and sculpture.

The reasons of this widely different treatment of art by the two authors are as worthy of notice as the treatment itself. With Sir Charles Bell expression is the material reflex or manifestation of mind. It indicates the command of an intelligent and sensitive being over the physical machinery which is its instrument—an instrument admirably adapted in every part for this purpose, and which has an important share in aiding the development of latent power. But that power, once developed through the double instrumentality of speech and gesture, may, and often does, assert its superiority by governing the physical machinery, not of course independently of outward conditions and bodily wants, but in absolute conformity to ideal aims, to a spiritualistic conception of life and labour. Of this outward revelation of powers and capacities, transcending all merely animal elements, great artists are the students and interpreters. As the result of their labours, its essential points are transcribed with ever-increasing fulness and accuracy for the delight and instruction of mankind. At first the interpretation is feeble and faltering, the transcript imperfect, but with the progress of art it advances in delicacy, truthfulness, and power, until it becomes an authentic revelation of the nobler elements of mind,

the higher nature of man. Sir Charles Bell traces this progress in his introduction :—

‘With better times the influence of the Church was more happily exercised, and finer feelings prevailed. The subjects were from the Scriptures, and noble efforts were made, attesting a deep feeling of every condition of humanity. What we see in the churches of Italy, and almost in every church, is the representation of innocence and tenderness in the Madonna and Child and in the young St. John. Contrasted with the truth, and beauty, and innocence of the Virgin, there is the mature beauty and abandonment of the Magdalen. In the dead Christ, in the swooning of the mother of the Saviour, and in the Marys there is the utmost scope for the genius of the painter. We see there, also, the grave character of mature years in the prophets and evangelists, and the grandeur of expression in Moses. In short, we have the whole range of human character and expression, from the divine loveliness and purity of the infant Saviour, of angels and saints, to the strength, fierceness, and brutality of the executioners.’

This manifestation of inward and higher feeling beautifies even what is physically weak, poor, and unattractive :—

‘Human sentiments prevailing in the expression of a face will always make it agreeable or lovely. Expression is even of more consequence than shape : it will light up features otherwise heavy ; it will make us forget all but the quality of the mind. As the natural tones of the voice are understood and felt by all, so it is with the movements of the countenance ; on these we are continually intent, and the mind ever insensibly exercised. . . . Anatomy, in its relation to the arts of design, is, in truth, the grammar of that language in which they address us. The expressions, attitudes, and movements of the human figure are the characters of this language, adapted to convey the effect of historical narration, as well as to show the working of human passion, and to give the most striking and lively indications of intellectual power and energy. The art of the painter, considered with a view to these interesting representations, assumes a high character. Every lesser embellishment and minuteness of detail is regarded by an artist who has those more enlarged views of his profession as foreign to the main design, distracting and hurtful to the grand effect, admired only as accurate imitations, almost appearing to be what they are not. . . . It is by his creative powers alone that he can become truly a painter ; and for these he is to trust to original genius, cultivated and enriched by a constant observation of nature. Till he has acquired a poet’s eye for nature, and can seize with intuitive quickness the appearances of passion, and all the effects produced upon the body by the operations of the mind, he has not raised himself above the mechanism of his art, nor does he rank with the poet or historian. . . . As we may define anatomy to be the examination of that structure by which the mind expresses emotion, and through which the emotions are controlled and modified, it introduces us to the knowledge of the relations and mutual influences which exist between the mind and the body. To the painter, therefore, the

study is necessarily one of great importance; it does not teach him to use his pencil, but it teaches him to observe nature, to see forms in their minute varieties which, but for the principles here elucidated, would pass unnoticed—to catch expressions so evanescent that they must escape him, did he not know their sources. It is this reducing of things to their principles which elevates his art into a connexion with philosophy, and which gives it the character of a liberal art.

‘By anatomy in its relation to the arts of design I understand not merely the study of the individual and dissected muscles of the face, or body, or limbs, but the observation of all the characteristic varieties which distinguish the frame of the body or countenance. A knowledge of the peculiarities of infancy, youth, or age; of sickness or robust health; or of the contrasts between manly or muscular strength and feminine delicacy; or of the appearances which pain or death present, belongs to its province as much as the study of the muscles of the face when affected in emotion. Viewed in this comprehensive light, anatomy forms a science not only of great interest, but one which will be sure to give the artist a true spirit of observation, teach him to distinguish what is essential to just expression, and direct his attention to appearances on which the effect and force, as well as the delicacy, of his delineations will be found to depend.’

This thorough knowledge of the groundwork or grammar of art, the play of the muscles involved in expression, Sir Charles Bell justly regards as essential to the production of ideal beauty, as well as for reaching the dignity, grandeur, and power, the majestic harmony and repose, that belong to the masterpieces of classic art. This end is obtained in the highest perfection, indeed, by vividly depicting the triumph of the mind over its physical instruments and conditions, the innate greatness of soul that overcomes the extremities of bodily torture and mental anguish:—

‘With the view of attaining beauty, the artist is not to slight nature or to avoid it, but to study it deeply, as the only source of improvement. He must not only contemplate those beauties which we may suppose to stand before him, but consider where they differ from others less admirable. How beautiful that smile! How eloquent those lips! Let him ask himself in what this consists. Smiling and speech are characteristic of man, and are bestowed to express the affections of the heart and communicate thought. Give to the mouth the capacity for these. Observe the forehead and the defined eyebrow: what is there in nature superior? Let him mark them, and then raise and throw forward the forehead—a feature especially human and elevating to the countenance. Now he sees that depth is given to the eye; that the shadows fall with bold relief; the eyebrow acquires more freedom, stands in a finer arch, and is more expressive of agreeable emotions. And thus he passes from point to point, from one feature to another—the nose, the ear—exaggerating a little the outline of whatever indicates the higher and purer qualities, and avoiding what is low, or whatever

is associated with the baser human passions or with the form of the brutes; and by insensible gradations and long contemplation of what is highest and best he acquires, and from nature, that idea which is, in his mind, the perfection of form. . . . Thus the painter must study the traits of human expression. The noblest aim of painting is unquestionably to affect the mind, which can only be done by the representation of sentiment and passion—of emotion as indicated by the figure and the countenance. But if it be contended that an imposing stillness and tranquillity must pervade the higher subjects of painting, I venture to affirm that it is a tranquillity which he can never attain who is not capable of representing all the violence and agitation of passion. It is not such repose as the artist who has despised or neglected natural character may be able to represent, but such as he alone can conceive and execute who has studied all the variety of expression, and learned the anatomy of the face and limbs in their most violent action. Nay, tranquillity or repose, in the strict sense of the words, can only be truly represented by one who can with equal facility give energy to the features and figure; for in rest there must be character, and that character will best be expressed by him who has studied the effect of the action of the muscles. It ought also to be remembered that repose and agitation must ever greatly depend on contrast and opposition. There are few grand subjects in history or mythology in which the tranquillity and higher beauty of expression in the main figure does not borrow some aid from the contrast of the harsher features, more marked characters, and more passionate gestures of the surrounding groups.'

From this just and fruitful conception of the relation of art to expression we turn for a final contrast to Mr. Darwin's account of his art-studies and their result. This account, short as it is, throws so much light on the author's taste and appreciation, that every word of it deserves to be recorded:—

'I had hoped,' says Mr. Darwin, 'to derive much aid from the great masters in painting and sculpture, who are such close observers. Accordingly I have looked at photographs and engravings of many well-known works, but, with a few exceptions, have not thus profited. The reason, no doubt, is that in works of art beauty is the chief object, and strongly contracted facial muscles destroy beauty. The story of the composition is generally told with wonderful force and truth by skilfully given accessories.'

Here it may be noted in passing that the author unconsciously reveals what he is in search of—'strongly contracted facial muscles'—and these, of course, mainly belong to the lower and more violent passions. But, apart from this, the statement as applied to the great schools of European art is so remarkable that we earnestly commend it to anyone, especially to any disciple, who combines confidence in Mr. Darwin's knowledge and judgment with the very slightest individual 'acquaintance with the subject. The statement

virtually is that in the works of the great painters and sculptors the countenances and gestures are as a rule inexpressive, the story of the composition being told by skilfully given accessories. We need hardly say that this is not true even with regard to ancient art—to Greek sculpture—where the sense of harmony, repose, and completeness of effect was so strong that expression and gesture are often partially sacrificed to beauty of feature and proportion of form. Even here, however, the educated and observant eye will find rich materials for the study of expression as well as of feature and form. But as applied to mediæval and modern art, and especially to the great Italian schools of painting and sculpture, Mr. Darwin's statement is ludicrously wide of the mark—is, indeed, the exact reverse of the truth. Expression is the very point by which modern art is so broadly and decisively separated from ancient art. This element is so predominant and distinctive as to constitute not only the glory of modern art, but to some extent its reproach as well. At least critics, like Winckelmann, devoted to classic art condemn modern or romantic art on the very ground of gesture being made too prominent, of a disproportionate attention being given to expression, beauty, harmony, and proportion being often sacrificed to the powerful rendering of passion. Critics of almost all schools, indeed, have recognised the tendency of modern art to make individual feeling unduly prominent, to give concentrated and intense, if not exaggerated, expression to emotion. The striking, and well-known contrast between ancient and modern art in this respect is brought vividly out in one of Browning's most characteristic poems, entitled 'Old Pictures in Florence.' While the whole poem is full of truth, stated in the author's eccentric and wayward style, a single stanza will sufficiently indicate the vital point of the contrast:—

' On which I conclude that the early painters,  
 To cries of "Greek art, and what more wish you?"  
 Replied, "Become now self-acquainters,  
 And paint man, man—whatever the issue!  
 Make the hopes shine through the flesh they fray,  
 New fears aggrandise the rags and tatters,  
 So bring the invisible full into play,  
 Let the visible go to the dogs—what matters?"

From the very rise of modern art in Italy, its progress was marked by a series of masters and schools, whose aim was to give full expression to varieties of personal character. Their work is conspicuous for the force of well-defined feeling in the

face and gesture of individual figures, and the dramatic interest of the groups to which they belong. The names of Cimabue, Giotto, Orcagna, and Massaccio, of Bellini, Titian, Giorgione, and Ghirlandajo, will sufficiently recall the long line of early but illustrious painters, remarkable for their vivid and powerful rendering of expression. Other contemporary masters devoted themselves almost exclusively to religious subjects, and became eminent for the exquisite truth and purity with which they delineated the more tender and intense affections, such as filial piety, saintly devotion, and maternal love. The best characteristics of these previous schools were, it is well known, united in the works of Leonardo da Vinci, Michael Angelo, and Raphael; and to say that the masterpieces of these great artists are relatively expressionless, that expression is neglected or sacrificed in their works, is simply a blank confession of ignorance or insensibility. If illustrations were required they might be found near at hand. From Raphael's cartoons alone there might be obtained admirable exemplifications of almost every human emotion dealt with by Mr. Darwin—of sorrow, pity, anxiety, and acute suffering; of joy, expectation, and enthusiasm; of hatred, malice, disgust, fear, wonder, horror, and amazement.

But although there is no historic truth or relevancy in Mr. Darwin's statement about art, it has no doubt a meaning in relation to himself and his own narrow point of view. He failed to find what he wanted in the best pictures and statues, because the great painters, while embodying in their works the whole range of human feeling, still select in the main for representation the pure, refined, and exalted emotions. These, as we already know, have little interest for Mr. Darwin. Had he taken a truer and more comprehensive view of the subject, instead of finding their works useless, he would have found them invaluable. Nay, even within the lower ranges and less noble aspects of emotion he deals with, Mr. Darwin would have found a little knowledge of art of essential service. We may take as a single example, his curious and highly characteristic account of tenderness and love:—

*'Love, tender feelings, &c.*—Although the emotion of love (for instance, that of a mother for her infant) is one of the strongest of which the human mind is capable, it can hardly be said to have any proper or peculiar means of expression; and this is intelligible, as it has not habitually led to any special line of action. No doubt, as affection is a pleasurable sensation, it generally causes a gentle smile and some brightening of the eyes. A strong desire to touch the beloved person is commonly felt; and love is expressed by this means more plainly than by

any other. Hence we long to clasp in our arms those whom we tenderly love. We probably owe this desire to inherited habit, in association with the nursing and tending of our children, and with the mutual caresses of lovers.

‘With the lower animals we see the same principle of pleasure derived from contact in association with love. Dogs and cats manifestly take pleasure in rubbing against their masters and mistresses, and in being rubbed or patted by them. Many kinds of monkeys, as I am assured by the keepers in the Zoological Gardens, delight in fondling and being fondled by each other, and by persons to whom they are attached. Mr. Bartlett has described to me the behaviour of two chimpanzees—rather older animals than those generally imported into this country—when they were first brought together. They sat opposite, touching each other with their much-protruded lips, and the one put his hand on the shoulder of the other. They then mutually folded each other in their arms. Afterwards they stood up, each with one arm on the shoulder of the other, lifted up their heads, opened their mouths, and yelled with delight.’

Here it will be seen that in Mr. Darwin’s view, maternal love can hardly be said to have any proper or peculiar means of expression. But had he carefully studied the Madonnas of some of the great masters, he would have found abundant reasons for a different opinion. We may give, as an instance, a description of one by Shelley:—

‘But perhaps the most interesting of all the pictures of Guido which I saw was a Madonna Lattante. She is leaning over her child, and the maternal feelings with which she is pervaded are shadowed forth on her soft and gentle countenance and in her simple and affectionate gestures. There is what an unfeeling observer would call a dulness in the expression of her face; her eyes are almost closed, her lip depressed; there is a serious and even heavy relaxation, as it were, of all the muscles which are called into action by ordinary emotions; but it is only as if the spirit of love, almost insupportable from its intensity, were brooding over and weighing down the soul, or whatever it is, without which the material frame is inanimate and inexpressive.’

This gives the main characteristics of the emotion. It is marked not only by absorbed devotion, but by infinite yearning and an almost divine compassion. It has, moreover, an element of latent sadness, of *attendrissement* inseparable, perhaps, from the depth and intensity of pure affection. The utter self-forgetfulness of the emotion, the complete outgoing of heart to the beloved object, subdues the harsher lines with which the violent and selfish passions—such as fear and jealousy, hatred and revenge—frown and scar the countenance. All hard lines and unlovely shadows melt away in the softened and radiant fulness of maternal fruition. From the object of devotion being neither superior in nature as in heavenly love, nor



in position and power as in conjugal affection, but wholly dependent and usually infolded within the caressing arms, the eyes will naturally have a downward gaze, and the lids, from the constancy of the habit, will be slightly drooped. Again, the strong maternal yearning, touched with seriousness in its depth and intensity, will slightly depress the corners of the mouth. The eyes and mouth, the main expressive centres of intensely human emotion, thus aid in portraying the dominant feeling. To so marked an extent is this the case, that there are many celebrated pictures, where, apart from the presence of the Divine Child, or other accessories, the expression of the Madonnas would at once be recognised as that of maternal love. The expression proper to other forms of the general emotion touched or charged with religious feeling or with devotion for a lofty ideal of any kind, are illustrated in the imaginative portraiture of saints and martyrs. Religious devotion, for example—the intense but calm and steadfast fervour of conscious absorption in a higher life, and the rapture of ideal passion, of ecstatic emotional fruition, are represented respectively in Raphael's St. Catherine and St. Cecilia.

It will be seen from the latter part of the passage quoted, that Mr. Darwin regards the highest form of this absorbing emotion—mutual love—as a cutaneous affection, resting ultimately on the mutual contact and irritation of adjacent claws and skins, and represented in the most lively form by the favourite actions and occupations of apes and monkeys. This view of the matter may be appropriately left without comment.

Before passing from the passage, which may be described throughout as a favourable specimen of the author's manner, we may however notice a characteristic piece of reasoning it contains. Just as Mr. Darwin's account of human intelligence and human emotion is an inversion of the true method of nature, so his argumentation is an inversion of the true method of reasoning. Much of it when carefully analysed will be found to rest on the novel principle that the effect produces its own cause. Thus, in the passage on love, Mr. Darwin argues that the desire of caressing springs from the habit of caressing; and as on this theory the habit cannot be traced to desire, it is perhaps ultimately resolvable into an aversion. And if so, on Darwinian principles, the desire of caressing would be explained by an aversion to caressing. This may be paralleled with the exquisite logical sea-saw in 'The Descent of Man' on the relation of higher mental power to language, the growth of speech being traced to the existence

of higher mental power, and the higher mental power ascribed to the use of language.

We must pass in conclusion from Mr. Darwin's acephalous method of gathering his facts to his equally characteristic and truncated method of explaining them. Mr. Darwin's great object in undertaking the explanation of expressive movements is to explain them away, to show that they are not essentially or ultimately expressive at all. The attempt, it need hardly be said, is unsuccessful, but it is interesting to follow the steps of the curious process. The two distinctive principles Mr. Darwin lays down for the interpretation of expression are those of serviceable associable habits, and of antithesis. His third principle, that of the direct action of the nervous system, may be thrown out of account, as it is not peculiar to Mr. Darwin, but common to him with other writers of the same school. The interesting point about the two principles as explained by Mr. Darwin is that they neutralise each other, are, in fact, mutually destructive. The first principle—that of serviceable, associable habits—rests on the assumption that gestures and facial movements are not originally expressive. On the contrary, they are wholly concerned with physically serviceable actions, the satisfaction of bodily wants, of mere animal appetites and desires. These in a reflex and automatic way become subsequently, through the influence of association, expressive of internal states, of mental desires and emotions. On the other hand, the second principle, that of antithesis, rests on the assumption that from the first a large class of gestures and movements are intentionally expressive, are adopted for the very purpose of manifesting outwardly inward states of feeling and desire. There is no doubt a good deal of truth in this view, but it is fatal to Mr. Darwin's general theory, as well as to the force of his first principle. He denies, and he is bound to deny, the intentional use of special muscles for the purpose of expression. They can originally be exerted, he maintains, only for bodily, not for mental purposes. Yet under the head of antithesis are included large classes of significant movements that are intentionally employed for expression, and have no other use. In these it is obvious that volition must have an active and essential share. They are, moreover, as primitive and original as the first class of expressive movements, being indeed their necessary correlatives. And correlatives, it need hardly be said, exist and are manifested in mutual dependence on each other.

According to the theory an antithetical expression is a spontaneous or intuitive reaction from a strongly-marked

gesture of an opposite kind. If hostility, for example, is manifested in a series of well-defined actions of an aggressive kind, friendliness will be expressed in a series of gestures exactly the reverse, and so of all the other movements coming under the same head. The gestures of desire will be the opposite of those expressing aversion, and those of joy the antithesis of sorrow. But it is clear from the nature of the case, as well as from the requirements of the theory, that both series must from the first exist, and be manifested together, as they are necessarily dependent on each other. The just inference, surely, therefore would be that they must be due to common causes, and exemplify the working of a common principle. If the one set of movements are spontaneous and instinctive, so also must be the other. The only way of escaping this conclusion, and saving Mr. Darwin's first principle, is by supposing that for countless generations animal life must have been vitally divided, cut in twain like the child of Solomon's Judgment, and the one half developed in a lop-sided manner irrespective of the other. It must be assumed that the one side or aspect of emotions and desires, which in actual life are the relief, balance, and counterpart of each other, existed in an isolated form; that the expressive movements belonging to them were from generation to generation slowly matured without any admixture of opposite gestures and expressions; that when they were all matured, a strong reaction set in, love coming to balance hate, joy to mitigate sorrow, desire to counteract aversion, and that the reaction developed a whole series of strongly antithetical expressive movements. It need hardly be said that this supposition is an absurdity. Still, if it is to work at all, Mr. Darwin's theory requires some such assumption.

This well illustrates the suicidal confusion which results from attempting to explain a product without taking fully into account one of the factors, and that the most important, essential to its production. Human gestures and expression, as the reflex of human intelligence and emotion, cannot of course be explained apart from the rational faculties which are their ground and cause. But in attempting the explanation Mr. Darwin deals only with animal elements, and thinks only of animal necessities. He justly assumes that expression having no direct physical use, is not absolutely necessary to animal life; and as he must identify rational and animal life, he naturally makes the same supposition with regard to man. Here, however, he at once travels beyond the record, and leaps to a conclusion not supported by the premises, and at variance with the facts. To a rational self-conscious being, like man,

endowed with progressive intelligence, ample means of expression are not only useful, but a vital necessity of the first order. The development of his powers depends on society, on intercourse with his fellow-men, and for this purpose he absolutely requires prompt and effective means of communicating both his thoughts and feelings. These wants are supplied by expressive gesture and articulate speech; and though man has never been found without the developed use of both, yet of the two, gesture, especially in earlier and ruder states of society, is the more important. It is a universal language which overrides all local dialects, and is everywhere intelligible. The testimony of explorers visiting unknown tribes and coming into contact with the rudest and most barbarous races, is on this point explicit and unanimous. Gesture-language enables men to communicate with each other in every corner of the globe, and is universally intelligible alike to the savage and the civilised. The language of expression is, moreover, in relation to the emotions and desires, a more distinctive and effective vehicle of communication than articulate speech. In this respect it reflects the superior force and directness of feeling as compared with thought. As the combination of letters and words in language expresses thought, so the rapid combination of living curves and lines, of varying lights and shadows, and quickly changing hues in the human countenance express feeling. It is, moreover, not only the more rapid and direct, but the truest and most authentic index of emotion—more delicate, diversified, and instantaneous than any other. In a larger view of use and service expression is thus to a rational being a prime necessity of existence, the very breath of social and progressive life. To meet these primary rational wants and desires is to an intelligent being quite as much an impulse and necessity of nature as the satisfaction of bodily wants is to a mere animal. Had Mr. Darwin taken a wider and truer view of use and service he would have perceived this, but his attention is so restricted to animal elements that he thinks only of animal uses. In other words, he has not included amongst his fundamental principles the human intelligence and emotion, without which it is for ever impossible to explain human expression. This is the fatal defect that vitiates so much of his ingenious speculation and laborious industry. Assuming only animal elements, Mr. Darwin employs them as a kind of common substance, a physiological gutta percha, which he is always trying to stretch and twist, to mould and manipulate, into the semblance of humanity. It is a vain and even preposterous effort. The confused and contradictory

results it produces sufficiently show that if you do not start with rationality or conscious intelligence in attempting to explain the higher powers and capacities, the distinctive acquisitions and activities of man, the attempt will inevitably fail.

Mr. Darwin's recent works are conspicuous monuments of this failure. In trying to extract reason and conscience out of animal elements he is, indeed, little better than a physiological alchemist, and his labours, in their higher scope, are just as barren as those of his chemical predecessors, traditionally connected with the darkest ages and the blackest arts. It is, indeed, a spectacle worthy of an elder day to see the venerable evolutionist bending over his slow metaphysical fire, mingling animal ingredients in the favourite crucibles of natural selection and sexual variation, and announcing with an air of absolute confidence and triumph the anticipated result. He evidently thinks that he has at length secured the 'drop profound,' the protoplasmic globule, which, under skilful distillation, may be evolved, not only into the panorama of animated nature, but into the long phantasmagorial procession of the different races and generations of men. But like the drop profound caught by the witches in its fall from the corner of the moon, and distilled with unholy rites in their seething cauldron, it simply leads on the eager inquirer into the mysteries of nature to his own confusion. The pursuit is a hopeless one, and the confidence in its results mere illusion. The higher secrets of nature are not so readily discovered or so easily exhausted. The *elixir rationis* is not thus to be obtained. But though the labour, in its higher aspects, is like that of the alchemist vain, it contributes indirectly to the advancement of science. Although the alchemists did not discover the secret of life or the philosopher's stone, their labours gave a useful impulse to chemical research. And though Mr. Darwin's efforts to extract reason and conscience from physical elements are vain, his writings have undoubtedly given a stimulus to the higher branches of physiological inquiry. And if, like the labours of the alchemists of old, they have done some incidental mischief in fostering vain expectations and prompting useless efforts, the example of such single-minded devotion to the speculative side of science is undoubtedly a noble one, and apart from the value of its results is justly entitled to admiration and respect.