# MODERN "SCIENCE," No. 1.

A

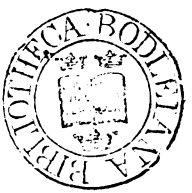
SCIENTIFIC VIEW

OF

# MR. FRANCIS GALTON'S THEORIES

OF

# HEREDITY.




BY

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# INTRODUCTION.

IN UNDERTAKING the conduct through the Press of the series of papers which my friend and *collaborateur*, Mr. Francis Lloyd, is about to produce, under the title of "Modern 'Science,'" I am but contributing to the completion of the work taken in hand a year ago in the publication of "Prussia's Representative Man." The literary interest excited by that volume seems to have blinded the majority of its numerous critics to the purely scientific object for which it was written; and it therefore seems fit that such explanation should here be given as will serve to link together the present with our past labours, and place them in their proper plane of research. It may then be hoped that the statement of merely new facts will not be mistaken for dogmatism, and that a scientific view of complex relations will not be regarded as betraying unfavourable moral qualities in the writers. Whether these errors of one critic arose from the fact so complimentarily stated by another, that we had taken pains to begin our * "own thinking at the very latest point reached

* Academy, 18th September, 1875.

by the thought of others," we would not presume to determine, but we would here desire to note the intelligent recognition of our labours as being * "the application of Darwinism to History;" and even when assailed † by the friends of Rousseauism and transcendentalism, we were not unmindful of the honour conferred upon us in that one of our adversaries was he who had been the worthy antagonist of Heinrich Heine, namely, the Young-Hegelian, Arnold Ruge.

In then bringing forward an almost unknown writer (Kleist) and placing him in opposition to those of his contemporaries and fellow-countrymen whose fame is world-wide, we did not so much seek to call attention to the masterpieces of a neglected Genius as to point out where and how the great masters had erred; and to indicate to what extent their errors had so become the truth of those who drew, and draw, inspiration from them, as to overshadow and almost suppress the merits of a lesser Genius who had triumphed where the greater failed. We preferred the illustration afforded by Germany, not because the history of that country is exceptional, but because, even at this moment—great as has been the recent progress of scientific thought, in contradistinction to what is at present considered typically German—all civilised peoples are influenced, to a degree of which they are little conscious, by the achievements of the great

* Pall Mall Gazette, 12th May, 1875.

† Gottschall's Blätter für Literarische Unterhaltung, 29th July, 1875.

writers produced by that nation at the close of the last and beginning of the present century. And it seemed to us that, only by tracing, in its chief and proper seat, the action of that to which we were opposed, could we bring home to our readers the novel truth we sought to inculcate.

As we have said, the object of our work was not literary in the ordinary sense of the word. It was, in the main, identical with that pursued by the late Mr. Buckle, namely, the application to more complex phenomena of that positive method which, in a lower sphere, has yielded such good results.

Since Mr. Buckle's time, a great change has come over the spirit of the age. With the triumph of the Evolution theory, there has grown up a feeling which demands from the man of science something more than a Voltairian overthrow of existing beliefs, or the cynicism of such doctrines as the "survival of the fittest"; a feeling, namely, which claims from all a respectful and discreet recognition of every form of truth—artistic, religious, or scientific—which helps to satisfy the craving needs of humanity. And, while heartily applauding the exact results attained by Science, we became alive to the impossibility of reconciling the emotional side of human nature with the dead results of reason, so long as Science was in a position to claim an unwarrantable authority over those other sources of knowledge at which the hearts of men instinctively inform themselves.

To make the application of our method effectual and fruitful, we became convinced that we must leave the well worn track of protests against priestcraft and human egotism, and grapple with the abstruser problems of Art and Human Developement, as observers desirous only of discovering the natural order where, hitherto, all had been in appearance chaotic.

And, thus, keeping ourselves free from the preconceptions that invalidated Mr. Buckle's labours, and taking nothing from facts but what they themselves warranted, our investigations were rewarded beyond all expectation. We were led to the conclusions that there were several kinds of truth differing from each other by reason of the limitations that surround their common source; and that the value of each of them might be subjected to a strict test, namely, the degree to which they were severally capable of influencing humanity.

To bring forward this discovery, no other form appeared to be so well adapted as that chosen in "Prussia's Representative Man," which afforded the opportunity of an ample verification proportioned to the vast area covered by the axioms therein established, which rest upon the same basis as those that form the Alphabet of Mathematics, namely, their self-evident nature and the impossibility of refutation.

Much has been said and written of late respecting the supposed conflict between Religion and Science. Our

aim and intention have been to prove—what the greatest thinkers profess to desire to realize—that there is necessarily no such antagonism, that each kind of truth has its own domain, and that the professors of each are bound to accept their proper limitations. It cannot be said now-a-days, that Religion persecutes Science; rather does the pre-eminence of the latter encourage it to over-ride and discredit the former, and when it can be stated, in * one of a scientific series of works, that "Faith must render an account of herself to Reason," it seems imperative to point out the fallacy of such dicta, and to uncover the intrinsic weakness of those who, as men of science, pretend to such overwhelming authority.

The task is by no means a grateful one, and the selection of the writings of any one individual to illustrate mischievous tendencies generally cannot fail to appear in some degree invidious, but the choice of Mr. Galton's work seemed fully justified by the support which has been accorded to it by men of great distinction.

The sole object in this review has been to confute specious arguments, and, by a wider outlook, to exhibit the delusive and unscientific nature of the propositions put forward; and I would hope that nothing herein may be construed in a personal sense.

W. NEWTON.

*11, Mitre Court Chambers,*
*Temple,*
*January, 1876.*

* The Conflict between Religion and Science. Draper, H. S. King, & Co. 1875.

"Will you with counters sum
The past proportion of his infinite?
Or buckle in a waist most fathomless
With spans and inches——?"

*Troilus and Cressida.*

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ERRATA.

Page 17, l. 30, for "class," read "chaos."

" 43, l. 24, for "expressions," read "expression."

to question and distinguish, as if they were robbing us of our best possession. In all history this consolidation of partial agreement into unyielding dogma is apparent. It is thence that we can easily explain what has puzzled so many enquirers, namely, the fact that talent reaps a richer harvest than original genius. The latter does look the gift horse in the mouth, reflecting that possibly it may turn out a white elephant: the former, on the contrary, contents itself with re-asserting the fact of the gift, which, as an idea derived from past experience, has a pleasing sound to the human ear. Every great effort of individual minds, when it penetrates to the masses, acquires thus a name that fresh greatness may trifle with at its peril. Prefix the word gift and the horse may be "sped with

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UNDER one aspect the phrase "It is not well to look a gift horse in the mouth," illustrates a tendency universal to the human race. There is in us a yearning for the absolute which, though circumstances may momentarily repress it, can never be lastingly affected. We desire the good or the bad, the great or the little, as the Germans say, "*faustdick*"; and when we have once had our belief in either confirmed, we turn on those who still continue to question and distinguish, as if they were robbing us of our best possession. In all history this consolidation of partial agreement into unyielding dogma is apparent. It is thence that we can easily explain what has puzzled so many enquirers, namely, the fact that talent reaps a richer harvest than original genius. The latter does look the gift horse in the mouth, reflecting that possibly it may turn out a white elephant: the former, on the contrary, contents itself with re-asserting the fact of the gift, which, as an idea derived from past experience, has a pleasing sound to the human ear. Every great effort of individual minds, when it penetrates to the masses, acquires thus a name that fresh greatness may trifle with at its peril. Prefix the word gift and the horse may be "sped with

spavins, rayed with the yellows, past cure of the fives, stark spoiled with the staggers, begnawn with the bots; swayed in the back, and shoulder-shotten," without the receiver being in the least unfavourably affected. In other words, the influence of the experience of other natures at other times is so strong upon the individual in question, that he does not venture to ask whether the animal be a gift at all, or rather a burden cast upon him by a wily foe. In truth a rose by any other name does not smell as sweet: nay, it may yield in perfection to other flowers, and yet by virtue of its name stand pre-eminent. Compare the names Shakespeare and Breakspeare, and try to decide on their respective poetic merit, independantly of their associations. The one is as Homeric as the other; yet because one appertained to the greatest of Englishmen, and the other to an insignificant pope, on hearing them pronounced we cannot hesitate in our choice. A man named Smith is not merely at an imaginary but at a practical disadvantage. With names, ideas are associated, and though amongst human beings the immense variety of personal appellations renders this little apparent, it is nevertheless the case that, as the rose, from the fact that numberless high natures have loved it under that name, becomes ennobled when the word is pronounced, so do individuals amongst us gain or lose by a mere word.

We fear we may be reproached for cynicism when we say that anything too good affords as cogent grounds for suspicion as its opposite. When everybody is agreed about something that does not admit of a mathematical

definition, say the word "gift," it is more than ever time to open one's eyes and examine carefully according to the intellect one possesses; for it is under the popular, not its opposite, that evil as a rule cloaks itself. Every coward can sneak in the rear of the conquering army, but with the defeated, even the brave may hesitate.

There is nothing to which these remarks more fitly apply than to a phenomenon the development of which is quite recent. It is not so long ago, historically speaking, that science was proscribed: that men whose names we now revere next to those of great artists, were exposed to the most unremitting social and State persecution, for venturing to follow the guidance of their senses. Copernicus, Galileo, and a hundred others of less note, were classed as heretics, and therefore, as capable, from the perversion of their natures, of every extreme of evil. Their strength, however, happened to be that of their generation. Mind after mind adhered to them, in spite of the difficulties opposed, and in the eighteenth century, what had been matter for such terrible reproach became one of the most boastful of titles. From that time to our own day the influence of this particular form of application has been extending. Material triumphs, which the popular mind can fully grasp, have assured its ascendancy, while the logical directness of its processes and the completeness of its results have continued to fascinate the more cultured. The evil, however, of which we have spoken, has not failed to make its appearance. Instead of being persecuted, science persecutes; it follows one from the study to the drawing room, and thence to the theatre and the

market-place, sparing none and taking as many forms as the vaguest of Indo-European superstitions.

In the Middle Ages, Catholicism was often grossly belied by its most fanatical adherents. Its doctrines were strained in the wildest fashion to shelter the whims and fancies of men who, without its ægis, would have been recognized in their proper character of fools and scoundrels.

In the same way science at the present day is made to serve the purposes of people who have as little in common with the true prophets of this branch of knowledge as have the medicine-men of North America. Every mode and style of trifling are dubbed scientific to insure respect and impunity. The effect of the name is immense. If the victim of studious spinsters or other varieties of the *earnest* genus venture to object, he is forthwith reminded of the benefits that have accrued from past investigations, and warned against the superficiality that makes him impatient of long words and dry definitions. Not merely indeed is science the hobby-horse of cheap charlatans, but actual reputations are based on a bold snatch at the name. The more absurd the pretension, the more ready the mob to gape at the new marvels its fetish affords.

It is against this pretence that we would protest in this article. Science is and remains a solemn thing, fit alone for solemn minds. It demands a wide knowledge, coupled with, what is still more rare, an extraordinary modesty. The influx of mere talkers cannot fail to have an injurious effect on its good name, and therefore, on its position; and it becomes a duty for those qualified to distinguish between its absence and its presence to

root out, to the best of their ability, the noxious weeds that threaten wholly to choke the precious growth.

The only difficulty in the way of him who would devote himself to this task, is that of choice. There are so many varieties of the false, that the true only peeps out here and there, rare and far between. Political economy is so overgrown with entities that one can hardly now discern the work of Adam Smith: social science roars and vaticinates alternately, to the terror of the wise and the delight of the foolish, while even physical science has riders attached to it that puzzle the will.

Mr. G. H. Lewes has ably defined science as "prevision based on quantitative knowledge." Without the latter, that is, without an exhaustive study of the qualities of the matter treated of, followed by a definition of their quantities, experience has proved that we cannot have the former. All that speculation which does not recognize and account for every variety of fact that comes within the vision of the enquirer is deductive, or as the positivists would say, metaphysical; inasmuch as it is a personal view supported by certain external phenomena, not an impersonal conclusion forced upon the thinker by the order of that which he observes. All science is, it is true, deductive, or metaphysical, inasmuch as its axioms are mere suppositions incapable of verification; but as those axioms are never on any occasion contradicted by facts, we are justified in assuming their objective truth. Hence mathematics was the first science known to man. It deals with something of which all the fundamental laws are easily within the grasp of experience, namely space. The con-

ditions under which the early civilizations grew up, were such as to preclude the extended observations which have given us geology, comparative anatomy, etc.

The labours of Aristotle are thus not science. He guessed indeed at the right method of investigation, but what he has left us concerning physics is a mere chaos of isolated remarks and clever surmises, only valuable in so far as they served to stimulate a spirit of enquiry. When thus prevision is lacking, *i.e.* where facts contradict assumptions, we are bound to class with merely personal speculation whatever is advanced, and deny all title to the name of science. Not, however, that the deductive method is valueless : on the contrary, as hypothesis, it does useful work, but in its best sense it is merely preparatory to the inductive, and in its worst a reaction from it.

The labours of Darwin are scientific, because he on all occasions never omits to distinguish between the application of either method, and claims no more for either than that to which it is fairly entitled. His scientific merit lies properly in his critical attitude. As yet the theory of the "Origin of Species" remains theory, in spite of the vast body of facts brought forward in support of it; but, on the other hand, those facts have proved, once for all, that the traditional classification of the animal kingdom directly contradicts a large number of the phenomena it was intended to cover, and thus in a negative sense Darwin's work is truly scientific.

His example, however, has done much to mislead weaker minds. His accumulation of facts, and the use made of them, have been confounded with the hy-

pothesis which he substituted for that which he proved to be false. Although many generations must certainly elapse before his theory can claim an equally firm foundation with that of gravitation, men do not hesitate to leave the still only partially explored field to plunge into regions which for science are *terræ incognitæ*. The same was the case with the teachings of Adam Smith. He, by a careful limitation both of time and matter, obtained certain results which proved that his appreciation of his subject was exhaustive. A light-headed generation of imitators, following in his track, unmindful of his critical attitude, but dazzled by the definiteness and certainty of some of his conclusions, have not hesitated to claim the extension of his method to regions where the master himself would have been as helpless and incapable as the meanest of his successors.

It is to this pitiable aftergrowth that we referred in our opening paragraphs. Folly, when it is popular, is so certain of toleration that we do not wonder that this particular form has been the subject of so little animadversion; but a passage in a late address of Professor Huxley's encourages us to believe that a criticism of one of its examples will not fail altogether to meet with sympathy.

The praise of a great man does not always constitute a title to excellence. Sir Walter Scott and Goethe both prophesied immortality to scores of poetasters who vanished with a season. It is natural that men, who by the force of their individuality have overcome immense obstacles, should mistake the external imitation of their own qualities for the qualities themselves, and also that the

pleasure given by the homage thus tendered should check their inclination to criticise. It is quite within the bounds of possibility that Adam Smith would have approved of the vagaries of social science congresses, and Cobden, if he were living, might have a sneaking *penchant* for the Cobden Club. It is at least certain that Darwin, a man whose name will ever be ranked among the foremost of this century, has on various occasions bestowed his approval on books whose sole merit lay in the fact that their authors accepted his achievements in their entirety. Indeed it is this that has moved us to the choice of Mr. F. Galton's work on "Hereditary Genius," by which to demonstrate our conception of what we believe to be a growing evil. A great name coupled with another, otherwise worthy of distinction, is sufficient to mislead and bring to nought numbers whose characters have not attained enough of ripeness to enable them to reject unwholesome mental food; and, as the influence of Darwin is ever increasing in geometrical ratio, it is a sovereign duty to call attention to those cases in which haste or leniency of judgment has seduced him into the promotion of serious errors.

The book referred to is best characterized by a travesty of a noble saying of old. When we style it "*un livre toujours sans peur et jamais sans reproche*," we believe we appreciate it at its exact scientific value. It is a work written for popularity, and it appears, from some reason not stated, to have been put forward in a raw and undigested state, without that care and consideration which should characterize its author's work.

We should be sorry to overstate the case, and will therefore let the book speak for itself. The introductory chapter opens with these sentences: "I propose to show in this book that a man's natural abilities are derived by inheritance, under exactly the same limitations as are the form and features of the whole organic world. Consequently, as it is easy, notwithstanding these limitations, to obtain by careful selection a permanent breed of dogs or horses gifted with peculiar powers of running, or of doing anything else, so it would be quite practical to produce a highly gifted race of men by judicious marriages during several generations. I shall show that social agencies of an ordinary character, whose influences are little suspected, are at this moment working towards the degradation of human nature, and that others are working towards its improvement. I conclude that each generation has enormous power over the natural gifts of those that follow, and maintain that it is a duty we owe to humanity to investigate the range of that power, and to investigate it in a way that, without being unwise to ourselves, shall be most advantageous to the future inhabitants of the earth."

As is the case with all the works we class as pseudo-scientific, this passage commences with a truism. No one who reflects for a moment on the facts can doubt that the relation between parent and child is the same that obtains in the rest of the animal kingdom. No one also can in consequence dispute that health as a rule begets health or that the hard head of the negro and the light foot of the Indian are inherited. All history proves that intellect goes by race, *i.e.*, that where we find intellect we also find race, though the converse is by no means borne

out by facts. The metaphysical starts out in the third sentence. We are told of mysterious agencies working in opposition, some for the elevation, some for the degradation of our mind. Not a word is said as to the origin and relative position of good and evil, the question that has proved in the past an insurmountable obstacle to the scientific study of humanity, and will probably always continue to render such investigations futile. The writer appears to assume that his own standard is final, that his own personal belief, or that of his compeers, is sufficient to enable him to pronounce one thing excellent and the other reprobate. In the same strain he follows up the assumption with the information that *as* he and those affected by his views are aware of what will be best for people in the future, it is our duty to apply the tools physical science makes ready to our hand to the construction of a generation that shall answer to *their* requirements. From the definiteness of the announcement one is at first led to believe that one is in presence of a summary of the philosophical labours of all time: it is not till one has turned over a few dozen pages that one realizes that such things can be advanced in the nineteenth century as a contribution to science, without at least a note to indicate that the author is acquainted with the names of those who have preceded him in the attempt to better humanity.

We learn next that "high reputation is a pretty accurate test of high ability." For hundreds of years, divines have been lamenting the popular favour shown to Barabbas, but divines weigh light, it seems, in Mr. Galton's balance. Reputation is something exact. It is true that we are

promised certain grounds for the acceptance of this belief, but our researches in the work not having been successful on this point, we are forced to consider them non-existent. Without any further attempt to explain elementary difficulties, we are carried "*in medias res.*" As we understand it, the argument runs thus. As it is conceded on all hands that children take after their relations in natural capacity, *genius* must be hereditary; and as *genius* goes by reputation, and reputation is in the hands of those who compile handbooks of "Men of the Time," we can learn what is good and true by an arithmetical calculation, based upon one of the said handbooks. The famous subject of debate in the Middle Ages, as to whether sin could have been atoned for had the Saviour appeared in the form of a pumpkin, is hardly equal in gravity and absurdity to this proposition. The term genius is introduced without a word of preface. The very thing that puzzles this as much as all generations to discern, is taken as clearly defined, because a common-place fact is prefixed. We hardly venture to ask if the author is aware of the half-ironical meaning of the word reputation. He is evidently convinced that science conceals many defects. He would be outraged if a theologian were to put to him the ancient logical proof of the existence of a Supreme Being and demand the concession of a perfect, as implied in an imperfect; but he is guilty of the same error when he asks us to accept one thing which he does not define at all, as part and parcel of another, which he gives without any of the needful limitations. Inheritance of excellence is the common order of things, but genius is genius

because it is out of that order. For instance, if in a primitive people the qualifications most esteemed are those of a good bowman, and some one invent a fire-arm, it does not at all follow that his ancestors were good archers: on the contrary the chances are that the hereditary powers that culminated in the discovery had until that moment been held in extreme contempt. No reflection, however, of this kind disturbs our author. He proceeds to compare life to an examination, and arranges his double-firsts, his honour-men, and his wooden spoons with a self-confidence that would be comic were he not trespassing on so grave a field.

On page 14,* we are presented with the issue in terms which are beyond the power of benevolence to misinterpret. Mr. Galton says, "I have no patience with the hypothesis occasionally expressed and often implied, especially in tales written to teach children to be good, that babies are born pretty much alike, and that the sole agencies in creating differences between boy and boy and man and man are steady application and mere effort. It is in the most unqualified manner that I object to pretensions of natural equality. The experiences of the nursery, the school, the university, and of professional careers are a chain of proofs to the contrary. I acknowledge freely the the great power of education and social influences in developing the social influences of the mind, just as I acknowledge the effect of use in developing the muscles of a blacksmith's arm and no further. Let the blacksmith labour as he will, he will find that there are certain

* "Macmillan," 1869.

feats beyond his power, that are well within the strength of a man of Herculean make, even although the latter may have led a sedentary life." This paragraph, beginning, like the first we cited, with the repetition of a commonplace fact, ends like that with an assumption of mental power which has never been proved to be the birth-right of humanity. Amongst us there are undoubtedly differences of strength and intellect, as wide apart as beauty and ugliness; when, however, Mr. Galton asserts that no man can go beyond his tether, he gives a false Turn to his truism. In the case of physical strength even, we have no absolute standard: it is the man who exerts power that wins the laurel, while mere capacity has but a speculative value like the virgin soil of the west. Exertion itself is conditioned by appreciation. The sophism lies in the confusion of two distinct quantities, the individual man in his relation to individuals, and a society in relation to societies. The individual is to his fellowmen of the same country as the society to the other peoples of the earth. In England, for instance, starting from common ground, we find in truth that the blacksmith can be exceeded in power by many who have not enjoyed his training. If, however, turning hence to some people among whom athletic exertion is not prized so highly, we compare the aggregate of strong men on either side, we shall find, given an approximate equality of race, that the sum of the strength of the trained vastly exceeded that of the untrained. The difference we mark between the individual and the nation has a thousand finer shades separating portions of the same people, as, however

far union may be carried, the principle of individuality of development is always at work. Practically, therefore, the reverse of Mr. Galton's proposition is true. Moral or educational influence is but another name for the opinion of the society, or fraction of society, to which an infant belongs; and as that opinion decides which of its faculties shall be called into play, it is of more importance than the special faculties with which the child is endowed. At this moment we despise idiots and hunchbacks, but that is no reason why all generations should do so. What change may have in store for the future is unknown to us, and without exact pre-science we cannot assert that the time may not come when the idiot or the hunchback may have an easier existence than he whom we call the normal man. In the time of Louis XIV., for instance, the growth of hair was as various as now, but of what use were luxurious tresses to the young noble whom fashion compelled to wear a wig?

The only true way of applying science to humanity, is to concede, for the sake of argument, the full claims of apparent fictions like morality, inasmuch as they are facts, to be studied equally with other more definite data. To doubt their validity is to impose one's own personal opinion on the universe, which is the very tendency in opposition to which science has been raised up.

Education, moral or otherwise, is the transmission of the experience of past generations to the one growing up. That the form is not exact, matters not: the fact remains. When we say that moral and other teaching are more important than the minor distinctions of individuality, we

simply state a truth observable at this hour by any newspaper reader. The Japanese, who triumph so easily in our examinations, could hardly be what they are if mental servility had not been a tradition of their race for centuries. Abundance of opposite qualities may,—nay, we should suppose must—have been present in that people at various times, but they have evidently been suppressed, morally at first, but in due course physiologically.

In truth, when Mr. Galton escapes the difficulty of a definition of genius by omitting any mention of the necessity of doing so, he leaps from the frying pan into the fire. Every human being possesses, in one sense, genius. If a couple of nailers receive so much iron apiece, though they work according to the same pattern, and be ever so well drilled to their task, the product of their labour will be separate and individual. It is but the inexactitude of language which, reflecting the human tendency to create opposing entities, sanctions the antagonism between mechanical and mental. The use of a tool or machine narrows indeed the sphere of character, but cannot annihilate its influence.

It is the custom, at the present day, to apply the word genius to him only who opens up a field of action, and to style that which follows up and completes his thought, skill, or talent; but, properly, every individual from the master to the feeblest copyist justifies his claim to the possession of the quality, by the introduction of some modification, good or evil, as circumstances may rule. A clerk cannot even take an impression of a letter in the press without his genius manifesting itself in a greater or

less strain on the handle of the machine. Hereditary genius thus means nothing more than that the young of animals resemble those from whom they spring, a fact which no one in his senses could dispute, and the proof of which would be unnecessary even were it not, as here, brought forward in so harmful fashion.

What we have said simplifies our criticism of the "Law of deviation from an Average." It is on this that our author properly bases his work. A Belgian man of science, M. Quetelet, not long ago discovered that there is a certain coincidence of variation from a common mean. For instance, if the average height of a thousand men were five feet six inches, there would probably be an equal proportion among them of men of five feet seven and five feet five inches respectively. His is a true scientific hypothesis approximately borne out by fact. M. Quetelet does not introduce any disputed quality. Height he acknowledges to be present in the least as in the greatest, and it does not for a moment occur to him to insinuate that one inch more is better than one inch less. All he endeavours to prove, is all that in the present state of our knowledge can be proved namely, that there are differences between men, and that where a common mean between them can be ascertained they vary on each side of it in an arithmetical proportion. The author under review, on the contrary, by his use of the words "idiot" and "eminent," conveys the idea that there is so much good and so much bad in the scale. On his own responsibility, or on that of a hand-book, he selects so many men of extraordinary distinction,

and finding the number coincide in a degree with the statistical returns per million of utterly helpless idiots, he works from either point to the centre, and arrives at an average of human ability. When this law is applied to a question of height we have a criterion. All humanity agrees in the application of the terms *higher* and *lower*. The smallest man will concede that he is shorter than his neighbour, although his pride may suffer from the confession. If the idea were liable to confusion; if lesser and greater were convertible terms, as is often the case with wisdom and folly; if the little man sometimes called himself big, and the big man sometimes called himself little; each in relation to the other, scientific method would be as out of place as solid architecture on a fog-bank. The exact moral value of a man is, however, as yet something beyond the powers of the greatest minds to define. Poll fools as to their due place in such a scale as that favoured by Mr. Galton, and see how much room will be left at the top for the intellectual. We are referred, indeed, to reputation as a criterion, but, as we have said, since the time of Barabbas, reputation has been at a discount with many of the wise. The test is perhaps good when applied to a competitive examination. The only uncertain quantity then is the varying humour of the examiners, which may be reduced to a minimum, amd thus Mr. Galton may be right in his belief that the results confirm those given by the simpler application of the "Law of Deviation from an Average;" but an examination is an attempt to fix a fraction of the fluctuating class of human concerns, and

has, therefore, no more to do with larger phenomena than skill in archery has with the invention of powder.

But our Author himself appears to afford all the reputation that is necessary to vitiate his own conclusions. On pages 37, 39, and 40, he thus sums up the arguments on which he proceeds. "Is reputation a fair test of natural ability? It is the only one I can employ —am I justified in using it? How much of a man's success is due to his opportunities, how much to his natural power of intellect? . . . . By reputation I mean the opinion of contemporaries, revised by posterity—the favourable result of a critical analysis of each man's character by many biographers. . . . . I do not mean high social or official position. . . . . I speak of the reputation of a leader of opinion, of an originator. . . . . By natural ability, I mean those qualities of intellect and disposition, which urge and qualify a man to perform those acts that lead to reputation. I do not mean capacity without zeal, nor zeal without capacity, nor even a combination of both of these, without an adequate power of doing a great deal of laborious work. But I mean a nature which, when left to itself, will, urged by an inherent stimulus, climb the path which leads to eminence, and has strength to reach the summit—one which, if hindered or thwarted, will fret and strive until the hindrance is overcome, and it is again free to follow its labour-loving instinct. It is almost a contradiction in terms to doubt that such men will generally become eminent. On the other hand, there is plenty of evidence in this volume

to show that few have won high reputations, without possessing these peculiar gifts. It follows that the men who achieve eminence, and those who are naturally capable, are, to a large extent, identical. . . . . I believe, and shall do my best to show, that, if the 'eminent' men of any period had been changelings when babies, a very fair proportion of those who survived and retained their health up to fifty years of age, would, notwithstanding their altered circumstances, have equally risen to eminence. Thus—to take a strong case—it is incredible that any combination of circumstances, could have repressed Lord Brougham to the herd of undistinguished mediocrity.

"The arguments on which I rely, are as follows. I will limit their application for the present, to men of the pen and artists. First, it is a fact, that numbers of men rise, before they are middle-aged, from the humbler ranks of life to that worldly position, in which it is of no importance to their future career, how their youth has been passed. They have overcome their hindrances, and thus start fair with others more fortunately reared. A boy who is to be carefully educated, is sent to a good school, where he confessedly acquires little useful information, but where he is taught the art of learning. The man of whom I have been speaking, has contrived to learn the same art in the school of adversity. Both stand on equal terms when they have reached mature life. They compete for the same prizes, measure their strength by efforts in the same direction, and their relative successes are thenceforward due to their relative gifts. Now if the hindrances

to success were very great, we should expect all who surmounted them to be prodigies of genius. The hindrances would form a system of natural selection, by repressing all whose gifts were below a certain very high level. But what is the case? We find very many who have risen from the ranks, who are by no means prodigies of genius; many who have no claim to 'eminence,' who have risen easily in spite of all obstacles. The hindrances undoubtedly form a system of natural selection that represses mediocre men, and even men of pretty fair powers—in short the classes below D,* but many of D succeed a great many of E, and I believe a large majority of those above.

"If a man is gifted with vast intellectual ability, eagerness to work and power of working, I cannot comprehend how such a man should be suppressed. The world is always tormented with difficulties waiting to be solved, struggling with ideas and feelings, to which it can give no adequate expression. If, then, there exists a man capable of solving those difficulties, or of giving a voice to those pent-up feelings, he is sure to be welcomed with universal acclamation. We may almost say that he has only to put his pen to paper and the thing is done. I am here speaking of the very first-class men—prodigies—one in a million, or one in ten millions, of whom numbers will be found described in this volume, as specimens of hereditary genius.

* These letters refer to our author's scale of comparative intellect. "A" indicates highest average and "a" lowest.

"Another argument to prove that the hindrances of English social life are not effectual in repressing high ability is, that the number of eminent men in England is as great as in other countries where fewer hindrances exist. Culture is far more widely spread in America than with us, and the education of their middle and lower classes far more advanced; but for all that, America most certainly does not beat us in first-class works of literature, philosophy or art. The higher kind of books, even of the most modern school, read in America, are principally the work of Englishmen. The Americans have an immense amount of the newspaper article-writer, or of the member-of-congress stamp of ability; but the number of their really eminent authors is more limited even than with us. I argue that if the hindrances to the rise of genius were removed from English society, as completely as they have been removed from that of America, we should not become materially richer in eminent men.

"People seem to have the idea that the way to eminence is one of self-denial, from which there are hourly temptations to diverge; in which a man can be kept in his boyhood, only by a schoolmaster's severity or a parent's incessant watchfulness, and in after life by the attractions of fortunate friendships and other favourable circumstances. This is true enough of the great majority of men; but it is simply not true of the generality of those who have gained great reputations. Such men, biographies show to be haunted and driven by an incessant craving for intellectual work. If forcibly withdrawn from the path that leads towards eminence, they will find their way

back to it as surely as a lover to his mistress. . . . . These considerations lead to my third argument. I have shown that social hindrances cannot impede men of high ability, from becoming eminent. I shall now maintain, that social advantages are incompetent to give that status, to a man of moderate ability. . . . .

"To recapitulate: I have endeavoured to show in respect to literary and artistic eminence—

1. That men who are gifted with high abilities—even men of class E—easily rise through all the obstacles caused by inferiority of social rank.

2. Countries where there are fewer hindrances than in England, to a poor man rising in life, produce a much larger proportion of persons of culture, but not of what I call eminent men.

3. Men who are largely aided by social advantages, are unable to achieve eminence unless they are largely endowed with high natural gifts."

The perusal of these extracts leaves us almost in doubt as to the consistency of the author. When he says that by "natural ability," he means those qualities of intellect and disposition which urge and qualify a man to perform acts that lead to reputation, he must be aware that he is ascribing equal relative eminence to the thieving hero of a larcenous society, with the statesman whose fame is great among civilised peoples. Nevertheless, he begins his work by asserting that the knowledge derived from such investigations can guide us in the developement of the race; so we may fairly ask what pitch of thievishness he would consider supremely excellent in a country where

reputation was acquired on the high road? When he further observes that it is almost a contradiction in terms to disbelieve that the men he describes should fail of their reward, we are tempted to doubt whether Darwin has any weight with him. The fact that writer sets most prominently before us is the profusion of nature. For one seed that takes root and flourishes, a thousand perish: for one variety of structure that suits the peculiar circumstances of the moment a hundred are fatal to their possessors. If this be true in the one domain, why not in the other?—at any rate the burden of proof to the contrary rests with Mr. Galton. He has indeed the caution to stipulate for the power of doing a great deal of laborious work, but that power is inseparable from physical health, and the latter as we know is subject to myriad accidents. Can it be believed that because a baby possesses great intellect and vigour in embryo, it will therefore be independent of the quality of its milk and the state of the drainage? And is not a man at every age more or less an infant in relation to the world at large? Lower down, the qualification is made, "a very fair proportion of those who survived and retained their health up to fifty," which practically amounts to an abandonment of the statement, and relieves us from the necessity of pointing out, that, a race of the same blood as ourselves, does not (for reasons unknown to our author) produce men of the type of our Lord Broughams. The paragraph comparing the two different varieties of men of middle ages, reveals many inconsistencies. If a man rise from one class into another, it is most probably because he has the qualities

peculiarly fitted for that class, and it is purely gratuitous to imagine because he has made one step forward that there is any likelihood he should make a second. The merchant who began as an office-boy would ridicule the idea of his becoming a poet or a statesman. Good soil kills poor plants. The shrub that flourishes on sun-dried rocks, would wither if transplanted to a hot-bed: and thus every presumption is against the meritorious servant becoming a meritorious master. When Mr. Galton fails to imagine how it is possible for a true genius to be suppressed, he seems to rid his memory of the most notable facts of literary and other history. Chatterton was indubitably the precursor of a great era, yet his life and activity were but for a moment, and it seems only chance that we ever heard of him at all. Galileo and Copernicus were certainly not welcomed with open arms by their generation,—it is said, indeed, that Luther would have burnt the latter if he could have got hold of him,—and from the fate of so many who have yet been heard of, it is easy to argue to that of others whose names never saw the light.

When further on we hear that genius is independent of the schoolmaster, etc., we are astounded that the writer should so limit his view as to blind himself to the true relation of that of which he treats. A great mind is deadened by influences which are of first moment to a mean one. To the mass of mankind strict discipline is necessary, to the exceptions it is injurious. Both classes, however, are equally subjected to a training which determines their future.

To recapitulate:

1. High abilities are from constant variation an unknown quantity.

2. The thing to be hindered not being definable, hindrances themselves remain indefinite.

3. Men distinguished for every degree of the presence or absence of natural gifts may rise into eminence at any time through unforeseen combinations of circumstances.

If on these three axioms a science can be founded, any one interested in enlarging the bounds of human knowledge, may apply them and appropriate the fruits. If they do not convey much novel information, they are at least unassailable.

The chief part of this work is occupied by a dreary gazette of those distinguished men whom it has pleased our author to select, for the honour of supporting his theory. Judges, divines, statesmen, painters, honourmen, and athletes are all heedlessly grouped together without any attempt to sever their relative claims to genius or to point out how each came to hold the position he did. There is a law common to all humanity, that that which is lowest in excellence is most easy to communicate. Wealth can be transferred from one to another intact, only the most vulgar of instincts being required to ensure it to its possessor. Skill in any art is next in degree easy of transfer: the great majority of children can be brought up as joiners, classical scholars, or the like, by the mere will of the parent. That, however, which we style creative is very rarely capable of transmission. Out of a million, one or two only are fired by the example

of a great poet to emulate his greatness. Skill, indeed, in his art, may be attained with ease, as long as it is a mere matter of imitation, but the absorption of those qualities of soul which enable a man to stand alone in the mental world, is recognizable rather by the difference between the poet and his model than by the resemblance. When, therefore, Mr. Galton takes a hundred judges and thirty-three poets, and treats their history as an equally valid exemplification of his belief, it is open to a critic to take three hundred rich men and put them on the same footing as the above-mentioned classes. If a particular quality is in especial demand at any particular time, it is most natural that retrospect should discover to us that not merely individuals, but whole families, were more or less endowed with it, and the lower the nature of what was esteemed, the greater the probability of its wide distribution. Now without wish to detract from the merit of great lawyers, we are forced to remark that, considering the limited numbers who contest the particular field, and the surprising frequency with which eminence is achieved, history may be said to prove that legal success, like commercial, is to a great degree conditioned by the possession of powers the reverse of original, the common property of many, and therefore of a comparatively low order. It does not astonish us then in the least, that Mr. Galton has found the kinships of such a class much more favourable to his purpose than those of the mental giants we style poets. What does take us aback is, that he should be oblivious to a distinction that is thoroughly understood and acted upon

by the world in general. There are thousands who deliberately train up their sons to be lawyers, but it would be difficult to find one man bold enough to bring up his child as a poet. "*Poeta nascitur, non fit;*" this old saying of Horace's is but an artistic confirmation of the well-known fact that a surpassingly great mind is the product of a conjunction of circumstances beyond human power to predict. That a lawyer or an oarsman could be made, the Latin would not have contested for a moment. To what end then draw up a long list of names where the very thing to be proved makes default? The book is entitled "Hereditary Genius," and if nothing further can be demonstrated than that where genius appears it casts a halo on those most nearly connected with it, the contents contradict the name. Shakespeare undoubtedly received the constituents of his moral and physical being from the English people, and it is equally indubitable that the English people in their turn profited by their kinship, but the fact proves nothing more than that circumstances were at the time favourable to a peculiar form of mind. Indeed previously to his appearance there was nothing to lead an average thinker to expect such a phenomenon in such a country. If *genius* were hereditary in the sense of our author, there would be an arithmetical proportion in its distribution, the absence of which is exactly what baffles the historical inquirer. If *genius* begot *genius*, what countries would stand higher than modern Italy or the United States? In reference to this latter, however, our author, in a paragraph previously quoted, expressly marks the lack of that power

of intellect which opens up new paths. Forgetful of his formerly expressed ideas, he associates it with the fact of the facilities afforded to developement beyond the Atlantic, and to do him justice, he takes the first opportunity to contradict his own statement, as may be seen in the following passage from page 362.

"The best form of civilization in respect to the improvement of the race, would be one in which society was not costly; where incomes were derived chiefly from professional sources, and not much through inheritance; where every lad had a chance of showing his abilities, and if highly gifted, was enabled to achieve a first-class education and entrance into professional life by the liberal help of the exhibitions and scholarships he had gained in early youth; where marriage was held in as high honour as in ancient Jewish times; where the pride of race was encouraged, (of course, I do not refer to the nonsensical sentiment of the present day, that goes under that name;) where the weak could find a welcome and a refuge in celibate monasteries and sisterhoods, and, lastly, where the better sort of emigrants and refugees from other countries were invited and welcomed and their descendants naturalized."

In other words, although it previously appeared that the removal of hindrances would not profit genius, it now seems that when they are removed, genius will prosper: a self-contradiction so marked that its equal might be sought unsuccessfully in a cycle of literature.

An excellent pendant to this is to be found in the chapter on the comparative worth of different races.

Speaking of the Athenians, Mr. Galton says: "We know, and may guess something more of the reason, why this marvellously-gifted race declined. Social morality grew exceedingly lax; marriage became unfashionable, and was avoided; many of the more ambitious and accomplished women were avowed courtesans, and consequently infertile, and the mothers of the incoming population were of a heterogeneous class. In a small sea-bordered country, where emigration and immigration are constantly going on, and where the manners are as dissolute as were those of Greece in the period of which I speak, the purity of race would necessarily fail. It can be, therefore, no surprise to us, though it has been a severe misfortune to humanity, that the high Athenian breed decayed and disappeared; for if it had maintained its excellence, and had multiplied and spread over large countries, displacing inferior populations (which it might have done, for it was exceeding prolific), it would assuredly have accomplished results advantageous to civilization, to a degree that transcends our powers of imagination.

"If we could raise the average standard of our race only one grade, what vast changes would be produced! . . . ."

Mr. Galton in the same chapter has previously admitted, that, "Under even a very moderate form of material civilization, a vast number of aptitudes acquired through the 'survivorship of the fittest,' and the unsparing destruction of the unfit, for hundreds of generations, have become as obsolete as the old mail-coach habits and customs, since the establishment of rail-roads,

and there is not the slightest use in attempting to preserve them; they are hindrances, not gains, to civilization."

Here the unscientific attitude of the writer's mind becomes most apparent. The word progress does not express any exact truth, but is simply the name given to the process of adaptation to changing needs. If we select any particular standard of excellence, an examination of history will show that we may retrogress from, as well as advance towards, that standard. This being the case, how can any man in his senses assert that if the Athenian race had survived and multiplied it would have continued in the same path, and under wholly altered circumstances have gone on producing the extraordinary results to which it owes its fame? If not the Athenian, the Greek race did survive and recover its position, but we know for a fact, that the Byzantines were as remarkable for the lack of the poetic faculty as the ancient Hellenes for its possession. In regard to America, Mr. Galton himself points out the difference between the parent people and its offspring, and can we be seriously asked to believe that the inhabitants of Boston are not physically as well endowed as ourselves and that a certain admixture of foreign blood has robbed them of the excellencies we possess?

The inaccuracy of the whole statement is striking. According to Thucydides Athens owed its origin to some of the causes Mr. Galton assigns for its fall. The courtesans are well-known to have been almost wholly foreigners, while the strictness of Greek domestic life was on a par with that of the Oriental nations. That a great

deal of immorality prevailed is undoubtedly true, but a gentleman whose works are published near Covent Garden ought to be aware that that does not necessarily entail national ruin.

When he utters his "if we raise the race," we are reminded of the child trying to grasp the moon. To desire omnipotence or omniscience were quite as reasonable.

The following from page 357, is in the true spirit of the class of men we wish to characterize.

"The long period of the dark ages under which Europe has lain, is due, I believe in a very considerable degree, to the celibacy enjoined by religious orders on their votaries. Whenever a man or woman was possessed of a gentle nature that fitted him or her to deeds of charity, to meditation, to literature, or to art, the social condition of the time was such that they had no refuge elsewhere than in the bosom of the church. But the church chose to preach and to exact celibacy. The consequence was that those gentle natures had no continuance, and thus, by a policy so singularly unwise and suicidal that I am hardly able to speak of it without impatience, the church brutalized the breed of our forefathers."

A man of science entering upon this question would first of all investigate the validity of the major premiss, and enquire whether the constant destruction of a particular portion of society leads to the gradual disappearance of the whole. For instance, he would ask if the wars of Louis XIV., and of the first Napoleon, had, from constant abstraction of the flower of the population, entailed a lower average of public health in France. Supposing

this were proved to be the case, he would proceed in the same way with his minor premiss. He would seek for information concerning the character and gifts of the denizens of convents and monasteries at different epochs, and attempt to deduce from general data the motives that impelled the court of Rome to impose celibacy. The result in the latter case would probably be that he would recognise that the measure was taken to add to the severely tasked strength of what was at one time the only corporate body representing civilization in Western Europe. Even then if he succeeded in mastering the two huge questions presented by his premises, he would not find any justification for strong language: on the contrary he would rather be inclined to admire the tact, skill, and self-sacrifice that enabled the weak to combat with the strong in that dark period of history. Of such a procedure this volume bears no evidence whatever. Our author not merely throws down his premises, as if they were sterling metal, hall-marked, but flies in the face of the fact that after the dominion for many ages of a celibate church, more genius appeared within a short interval, than, with the exception of Greece, previously in any region of the globe. He goes on to say,

"She" (the church) "acted precisely as if she had aimed at selecting the rudest portion of the community to be, alone, the parents of future generations. She practised the arts which breeders would use, who aimed at creating ferocious, stupid, and currish natures. No wonder that club-law prevailed for centuries in Europe; the wonder rather is, that enough good remained in the veins of

Europeans to enable their race to rise to its present very moderate level of natural morality."

Not content with this, our author further ascribes much of the present lack of intellect to the persecutions of his bug-bear, the Church. Confounding one epoch with another, with a boldness beyond compare, he says:

"Hence the Church, having first captured all gentle natures, and condemned them to celibacy, made another sweep of her large nets, this time fishing in stirring waters, to catch those who were most fearless, truth-seeking, and intelligent in their modes of thought; and, therefore, the most suitable parents of a high civilization, and put a strong check, if not a direct stop, to their progeny."

The "Church" is here presented in so forcible a light, that we shudderingly recall the giants before whom we were taught to tremble in infancy.

From the preceding paragraph, we might be inclined to believe, that inasmuch as the Church abstracted the most gentle natures, itself was composed of such natures, but it appears that there was a something beyond mere flesh and blood, styled a "Church," which had the power of swallowing the gentle and stamping out the rough.

Reading such passages as the above, who can refrain from sympathizing, when in a previous page (345) our author exclaims, "We are in crying want for a greater fund of ability in all stations in life; for neither the classes of statesmen, philosophers, artizans, nor labourers are up to the modern complexity of their several professions. An extended civilization like ours comprises more interests than the ordinary statesmen or philosophers of our present

race are capable of dealing with, and it exacts more intelligent work than our ordinary artizans and labourers are capable of performing."

On page 359, we learn that, because in the course of three centuries, 32,000 persons actually perished in the flames in Spain, and 17,000 were burnt in effigy, while 291,000 were seriously punished at the hands of the Inquisition, "It is impossible that any nation could stand a policy like this, without paying a heavy penalty in the deterioration of its breed, as has notably been the result in the formation of the superstitious unintelligent Spanish race of the present day."

However much what we have previously cited may have prepared one for sturdy illogicality, the bluntness of intellectual comprehension here astounds and confuses. We, in England, have been hanging a very liberal per centage of rogues for many centuries, and yet we retain not merely enough for home consumption, but, as French and American criminal records prove, for a very abundant exportation. A little further on Mr. Galton himself speaks of the expulsion of the Protestants from France, and of the general slaughter of the most distinguished families there, at the time of the revolution; but though he lays stress on the good England derived from the folly of her neighbour, no attempt is made to apply the same argument as in the case of Spain. In point of fact, the very reverse of this gentleman's notion seems to be proved. The revocation of the Edict of Nantes, was followed by the developement of an intellectual and physical splendour, till then unknown in France; while the annihilation of

those families whose traditional privilege it was to hold military command, was almost instantly succeeded by the epoch of great soldiers, which culminated in Napoleon. The gigantic loss of life under the latter, did not in the least check the moral energy of the people. Since 1815, France has produced a wholly new literature, and has competed worthily with its rivals in every other field.

We have not space to quote more: it would, indeed, require a stout octavo volume to do justice to what is but a large aggregate of blunders. The error is everywhere the same. Mr. Galton recognizes, indeed, the existence of both the moral and the material in man, but, without an attempt to grapple with the real problem, he deliberately gives the preëminence to that which both general custom and the judgement of our greatest thinkers have long pronounced to be inferior.

To the success attendant on "Hereditary Genius," we presume we owe its recently published pendant, "English Men of Science, their Nature and Nurture." As we have already observed, it is characteristic of pseudo-science, that its conclusions and pretensions are as pleasing and attractive as the results of true science are harsh and uncompromising. In this case, where a variety of merely biographical details have been invested with the interest attaching to scientific investigation, we are not surprised to find even such a man as Mr. Herbert Spencer lending his aid and countenance to the undertaking. This new work, however, is, if possible, still more deceptive than its predecessor. Its object is professedly to work out more fully the relative efficacy of hereditary endowment "as

compared with that of education, tradition, fortune, opportunity and much else." The author intending, as it appears, to continue his enterprise, has thought it best to limit his first volume to the history of men of science, whose sociology he has "investigated from wholly new, ample and trustworthy materials." The materials in question are, indeed, in one sense, both new and ample. Their novelty is absolutely painful to one accustomed to the slow processes of real science; and we cannot imagine any one who could not be contented with considerably less than what is here presented.

The author's first difficulty is the same encountered at starting in the previous work, and it is overcome with equal jauntiness. "A Natural history of men of science," is, we are told, the object in view; but, though the second paragraph is headed "Definition of" Man of Science, we are quietly informed that it is impossible to define a "scientific man;" from which Mr. Galton concludes, not that his book should never have been written, but that he has a right to recur to his favourite criterion, reputation. To have been elected a Fellow of the Royal Society is, it appears, a real assay of scientific merit. To have earned a medal for scientific work, to have presided over a learned society, or to be professor at some college or university, is also an achievement sufficient to justify the use of the coveted title. To object to Mr. Galton's first test is slightly invidious. A bishop, writing a natural history of men of exceeding piety, would probably be justified in assuming that every bishop was a saint, and why should we not concede to the new hierarchy what

one would so willingly grant to the Church? The French say, "*Les honneurs donnent l'esprit*," and we do not wish to press hard on one who has so much need of every obtainable support as our author. What we cannot help objecting to, however, is the assumption, that, supposing all the men of Mr. Galton's choice to be truly scientific, certain details connected with the lives of this limited number have any value whatever beyond that attaching to ordinary biography. To enable the reader to realize the absurdity of attempting to deduce a law from a partial examination of facts, we will place before him a favourite notion of our own. Having resided in many different countries, we have had peculiar opportunities of observing the results of intermarriage between individuals of contrasted but not unequal races. In almost every instance within our knowledge, the progeny of such crosses has been distinguished beyond the parents either for beauty or intellect. Although, however, our experience has been almost uniform on this point, it is almost valueless for scientific purposes. An exact enquirer, bent on turning it to account, would ask us first to define beauty and intellect, a labour to which, probably, only a Chinaman would feel himself equal. Even if we succeeded in overcoming this difficulty so as to secure general assent, our observations could only be recorded as data of a very partial and imperfect kind; and he who rashly ventured to form a conclusion thence, would find himself involved in a maze of crass contradictions. What Mr. Galton is striving to accomplish is, however, simply what we should be guilty of, if we asserted that a cross always

improved the breed among human beings. He has, indeed, the advantage, that his list comprises most distinguished names, and that by systematic labour, he has been able to collect a number of facts not always within reach of the individual; bnt inasmuch as he can no more define intellect than he can set up a standard of absolute good, all he is able to give the world is a tabulated series of facts concerning people in whom he is interested, a thing that might have been better done, without flourish of the scientific trumpet, by a man of artistic feeling.

What distinguishes science from other forms of enquiry is the presence of method in every stage. A fact —and on facts science is built up—may be ever so true, and yet, if not susceptible of verification, utterly valueless for scientific purposes. It is to the difficulty earlier thinkers found in realizing this truth, that, as Mr. Lewes has so admirably shown, the tardy progress of science is due. For the artist, personal impressions and beliefs are of immense importance. Men's heads growing beneath their shoulders, the freaks of the fairy world, etc., are rich material to him, inasmuch as it is his to give a picture of human nature as a whole, and every fancy that characterizes man is a truth in relation to the individual. Science, on the contrary, demands that every particle of knowledge it accepts, be of such a description, that it can be subjected to varied tests, the application of which must not in any way shake its validity, as else it becomes worthless. Hence the fact, that science has hitherto only been applicable to the least complex of phenomena.

When, therefore, Mr. Galton proffers the confessions of a few individuals as a basis for exact conclusions, he errs as wildly as those of the Greeks who accepted oral traditions and travellers' stories as objective truth. However sincere the answers of his correspondents may have been, verification is out of the question. The experience of courts of law alone would prove that no man's evidence concerning himself is reliable. It would, indeed, be contrary to the first principles of human nature, if such were the case. To see ourselves as others see us, would be the greatest of misfortunes.

As we have recently indicated in another place,* the only way in which a science of man can be approached, is by a selection of those portions of his character and history which can be subjected to verification. This, again, can only be done by taking certain aggregates, of which we possess definite records.

If we were to question, for instance, an American Indian about his mental developement, we should encounter much that we should consider childish folly; and yet his relation of his experience would be, as a fact, equally valuable with that of any other man. If, however, we raise the question, whether the Indian races in America have succumbed to superior civilisation, we obtain something that can be submitted to the most rigourous tests, and that runs as little risk of contradiction as the theory of gravitation.

Mr. Galton attempts to escape reflections of this kind,

* "Prussia's Representative Man." (Trübner & Co., 1875.)

which cannot but force themselves upon him, by asserting that men of science are more honest, straightforward, and manly than any other class. That such an opinion can be advanced on purely subjective grounds by a Fellow of the Royal Society, is a striking proof of the slight degree to which scientific thought has leavened even the leading minds amongst us. It is, indeed, perfectly legitimate to hold, that an Englishman is more upright than a Hindoo, or that a Frenchman is braver than a Chinese, but such opinions are popular—the result of poetic thoughts—and having nothing whatever to do with the kind of truths which it is the task of most of our learned societies to seek. If our author had asserted that Martin Tupper was the greatest of all poets, and had framed a system on that assumption, he could not have gone further astray from the teaching and practice, say, for instance, of his kinsman Darwin.

It is as a moral duty that we protest against the perversion of one of the noblest acquisitions of modern times. In the work previously referred to, we have shown that the scientific is the lowest view of things; and when, as is so frequently the case at the present moment, method is thrown to the winds and the functions of the artist and preacher are assumed by those whose profession it is to see nothing but calculable quantities in nature, we are face to face with an evil as great and real as that belief in purely physical force, which brought ruin on early Christianity. He who compels faith by the sword and by torture; and he who invites to a Paradise of ready money and cheap night-caps, are one and the same man,

as exhibited by different circumstances. Bentham's "greatest happiness of the greatest number," was simply a poetic thought carried to such a pitch of vulgarity, that one hesitates to apply the true name. Science has never even ventured to touch the question of good and evil, of pleasure and pain. Even if with time, it developes to such a degree, that an investigation of the kind become justifiable, the matter can only be the subject of theory, for the experience of the individual can never be reduced to figures. In the work we have mentioned, we refer all differences to extent. That which is most identified with the moment we declare to be inferior to that which can endure through a long succession of changes. Bentham and all other materialists are beneath those who appeal to the more subtle feelings of mankind, inasmuch as their ideal is taken from a momentary fashion. If, during the war against Napoleon, a sturdy Englishman had been asked which were better, to conquer the foe at the price of endless misery, or to yield tamely and escape all burdens, he would have answered that death was a thousand times better than disgrace; and how much deeper the truth of such a reply, than that of the cheap calculation that came into vogue in the days of our distress, when victory had come and passion had cooled, the wonderful rise of Great Britain since 1815 demonstrates surpassingly.

To Mr. Galton, as to Jeremy Bentham, the world he sees is the world that will endure. There is no doubt that science is a very great and very good thing at this moment, and therefore its increase is for him a something to be striven after with heart and soul. He proposes,

as a result of his enquiry into the individual history of one hundred and eighty persons, that monetary endowments should be forthcoming to further developement. Such a demand as this characterizes most aptly the tendency of such labours as his. Not very long ago, Professor Huxley, speaking in the name of science (and who with better right?), declared that, much as he desired the advancement of certain studies, the results yielded by money-gifts were such in other branches, that he could not hope anything from the extension of endowments. The error, indeed, of those who imagine that piety and learning can be increased by the transfer of so much coin to the hands of those who profess the several qualities, is the same as that of those political economists who assume that wealth is produced by capital and labour alone. In each case there is a limited basis of truth. A poverty-stricken university, if suddenly possessed of large funds, would probably attract and develope an immense amount of talent in the first years, but that simply because, although grown wealthy, the spirit that actuated it would be that nurtured anterior to the change. In a nation also, for the moment there is nothing visibly concerned in the production of wealth but capital and labour, and any considerable addition to either would, for the moment, proportionately increase the aggregate. Supposing, however, that this increase be achieved, as such things usually are, at some moral sacrifice,—as, for instance, would be the case if we admitted large bodies of Chinese into these islands, —the unimportance of realized possessions, compared with

those that apparently only exist in the heart and brain, would soon become evident to all. Decay of patriotism, again, entails insecurity, and by national insecurity more can be lost in one day than labour and capital can make up in years. In the case of certain promoters of charitable institutions much that is favourable may be advanced. Although the adhesion for a long period to that which they accomplish generally leads to corruption and ruin, they may at the time, benefit their age largely; and where such benefits are imperative deeds at the moment, the thinker must trust to the vitality of posterity to overcome the evil legacy. With Mr. Galton, however, it is different. He is not, and does not profess to be, a man of action. His object is the discovery of certain principles by the application of scientific method; and, as he assumes the success that has not rewarded his efforts, and then essays to read the world a lesson, he is false to the needs of the time. Every snatch at an evanescent advantage is, according to our theory of extent, comparatively evil. It can only be good when taken in subordination to that which is more enduring. Where, as with our author, that which is but for a moment usurps the authority that pertains to the grandest forms of human expressions, either the race must be fallen to such a degree that great good would be destruction, or the tendency is one to be combated with every weapon.

*Real Science* can never be guilty of the sins charged upon it by its adversaries. Though less than art it is equally pure. It is the misapplication of its teachings that leads to absurd and pitiable results. There is, for

instance, nothing more unreasonable and foreign to its nature, than to assume certain mysteries and to declare them beyond the reach of human intellect, as is at present vulgarly the custom when the Deity, the object of existence, and the like are spoken of. Science is exact and definite. Although it may make unexpected discoveries in its progress, it must realize clearly at starting both its object and the means to be employed. With such questions as the above, it has simply nothing to do. That it is impossible to conceive omnipotence or the like scientifically, is proof of nothing more than that science is unequal to the task, and that the enquirer must turn to some other mode of expression to find satisfaction. When people complain that they have been robbed of faith and hope by certain matters that have been put before them, they simply lament their weakness. To the due exercise of our instincts and passions we owe our humanity: if we cannot find a field for them we cease to be human, nay, even to live. The folly of attempting to apply exact reason to the details of such phenomena as religion, becomes manifest when we essay to analyse any of those realities concerning which it is the province of the poet and the artist to dictate. No possible strain could bring science to bear, for instance, on ugliness. There is no convention whatever to go upon. How much more helpless then, must our method be, when applied to the conception of a Supreme Being. When the object of being is spoken of, the true answer is, there is nothing in the premises to suggest it. Supposing the existence of anything similar, it would be imposssible to become scientifically conscious

of it. Science can only see man, like the grass in the field waxing and waning, according to his needs and the means he finds of satisfying them.

Another point which our consideration of these works forces on our attention is this. Great things in little men become petty and trivial, while littleness expressed through great natures becomes great. The poet who creates a civilization cannot personally carry out the details of his concrete thoughts, and must give place to minor agents, animated indeed by his spirit, but so much beneath him, that, in ordinary language, we recognise no community whatever between master and servant. Shakespeare and Byron are at this day often represented by Sergeant Stubbs. The patriotism of the one, the free-thought of the other, are translated by that intelligent and useful officer into brutality to *niggers* and a tendency to make free with sacred things. As however, all who will take the trouble to reflect must see that both the poet and the rough man of action have their places in the world, and that there is no ground on which to expect another order of things, we cannot be blind to what might occur if the fountain-head of our Genius should descend from the mountain peak to the plain. Into what would Sergeant Stubbs translate the theories of Mr. Galton? We have had political experience of late that awakens great suspicion concerning the infallibility of certain matters which we have spent half a century in praising. To reverence and study greatness of the highest kind is surely a better method of improving the race than to set up a transitory standard of excellence and attempt to attain it by a procedure borrowed from stock farmers. The result

indeed of artificial cattle breeding, reads us the plainest of lessons. Useful as are the varieties that have been produced to the communities that feed and protect them, they have undoubtedly not the capacities they possessed in a wild state, and would be helpless without the companionship of man. A selection of human beings for certain qualities that happened to be in fashion at a particular date would assuredly produce a race which, without the presence of the feeling that brought it into existence, would perish miserably; and what fashion is and how liable to change in every detail need not be recalled to the mind of the least observant.

Deep, indeed, would be our despair for the cause of true science if, in closing our review of Mr. Galton's labours, we could point to no work on the same subject in which a fair attempt had been made to grapple with the difficulties presented by its vastness and complexity. M. Th. Ribot's volume on Heredity * fortunately came to hand, however, about the time when we had completed this paper. In it human affairs are treated with the reserve incumbent on the true student, and we were pleased to observe in it evidence, that there is a school of foreign writers who have known how to learn from us without yielding to those temptations, springing from the recently enlarged scope of science, which have here had so fatal an influence on men of undoubted merit. M. Ribot also reviews "Hereditary Genius" and though he is apparently unaware of the tendencies which it promotes, and by which it is promoted, and therefore more inclined to look upon

* H. S. King & Co., 1875.

it with indulgence, his judgement in the main is consonant with our own. That a man of such ability, should have expressed this opinion, might seem to render some portion of what we have writtten superfluous, but so strong is the charm exercised by the quantitative method of Mr. Galton on contemporary minds, that we were not surprised to find in the "Saturday Review"* an article in which the excellence of M. Ribot's work was construed into a fault. Ignoring the brilliant apology he makes for the tentativeness of his investigations, the English critic insists that we have a right to expect guidance from those who treat humanity scientifically. That such a view should be propounded by a journal of such high standing and so little open to the reproach of narrowness which can often be preferred against professional and technical organs, shows the immense difficulty of the task we have undertaken. The reviewer in question would probably not dream of asserting that medical men are the best judges of poetry, yet in an exactly parallel case he would invest the student of physics with an authority embracing any and every condition of human life. We trust, however, that there is yet a large public which, while warmly cherishing science, is fully alive to the broad distinction between cattle breeding and human developement, and which in many cases is only restrained from a definite expression of opinion by the technicalities which, to a somewhat unjustifiable extent, hedge in and shroud the views advanced by many recent thinkers. To this wider public we in this series appeal. The temporary decay of

* 29th May, 1875.

true thought is a thing by no means unknown in history, and it has always been accompanied by similar phenomena, and if we can succeed in persuading even a minority of our readers that much that is now fashionable is neither new nor good, that many ancient errors once clothed in the jargon of metaphysics are now presented afresh to the world, dressed in figures and bolstered with statistics, we shall be fully rewarded for a not altogether attractive labour.

FRANCIS LLOYD.