Browning as a scientific poet / by Edward Berdoe.

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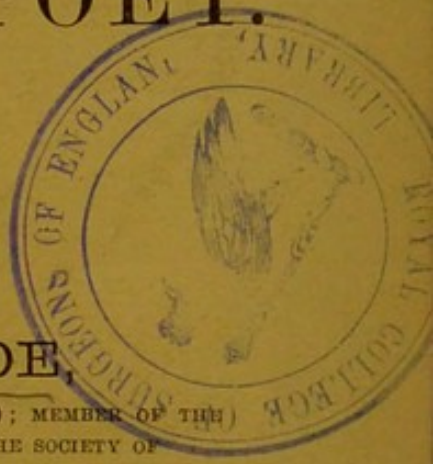

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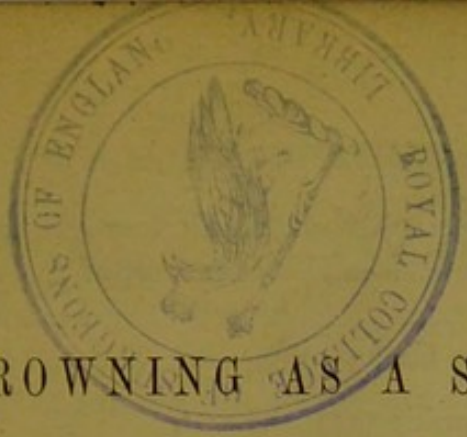

BROWNING AS A SCIENTIFIC POET.

BY EDWARD BERDOE, M.R.C.S. (Eng.), L.R.C.P. (Ed.).

Read at the Meeting of the Browning Society, on Friday, April 24, 1885.

The commonly accepted notion of poets and poetry excludes the idea of the scientific habit of thought, and still more of its expression. We expect the poet to speak to us, in metrical language, of the passions and interests of man, and to interpret for us the voice of nature in strains that are not hampered by exactitude and precision. In other words, we grant him "the poet's licence." But as all this is just the opposite to our demands on the man of science, it seems a contradiction in terms to speak of a scientific poet. It jars upon our ideas of the fitness of things. But why? Because they are conventional ideas, and our notions of poets, and what constitutes true poetry, are not always inspired by familiarity with the greatest masters of the art. The scientific method, it is true, is not in favour with the minor poets, and it is not given even to all the greater to combine with the highest poetic faculty the deeper insight into the hidden things of nature possessed by Robert Browning. In him, as I hope to show, the poetic and scientific methods are not merely found together, but are truly combined; and throughout his works are scattered abundant evidence that he, with keen vision, has seen far into the workings of Nature, and ennobled his phrase and verse from the study of her phenomena.

Milton has done this too; and Tennyson has proved that the scientific spirit can enrich his verse, and that he, in turn, can invest the operations of natural laws with the enchantment of his art. Who could have imagined that a poet would have stated the atomic theory of Lucretius in the magnificent terms that he has done?—

> "A void was made in Nature; all her bonds
> Cracked; and I saw the flaring atom-streams
> And torrents of her myriad universe,
> Ruining along the illimitable inane,
> Fly on, to clash together again, and make
> Another and another frame of things
> For ever."

As a specimen of Tennyson's poetry, I don't think any one can say it is spoiled by being a statement, and an accurate one, of the atomic theory.

And if for Browning it be true that

> "Verse was a temple-worship vague and vast,
> A ceremony that withdrew the last
> Opposing bolt, looped back the lingering veil
> Which hid the holy place,"
>
> (*Pauline,*)

what wonder if he speak of the deepest thing the holy place enshrines in the sacred language that befits its service?

It would probably not add to Mr. Browning's popularity were the world convinced of his advanced standpoint. It is not apt to love overmuch to be taken out of its depth; it likes its poets to sing as caged birds are taught to warble—songs piped by itself, and demands of its Sordellos that they shall be bards and not philosophers:

> "Why introduce crotchets like these? fine surely, but no use
> In poetry—which still must be, to strike,
> Based upon common sense; there's nothing like
> Appealing to our nature.
> . . . . . .
> Would you have your songs endure?
> Build on the human heart."
>
> (*Sordello.*)

Apart from the fact that we are not accustomed to find the poetic and scientific natures co-exist, there seems a tacit understanding that it is somehow an offence (even when they do) if the poet trench on the other's province. In a humorous letter to the *Pall Mall Gazette* the other day, on the question whether a certain flower of delicious odour should be called "tube-rose" or "tuber-rose," the writer says that he is "deeply distressed to hear that *tuberose* is so called from its being a 'lumpy flower.' It is not at all lumpy, and even if it were, no poet should be heartless enough to say so. Henceforth there really must be two derivations for every word, one for the poet, and one for the scientist. And in the present case the poet will dwell on the tiny trumpets of ivory into which the white flower breaks, and leave to the man of science horrid allusions to its supposed lumpiness, and indiscreet revelations of its private life below ground. In fact, tuber as a derivation is disgraceful. On the roots of verbs philology may be allowed to speak, but on the roots of flowers she must keep silence. We cannot allow her to dig up Parnassus."

Darwin's investigations into the fertilisation of plants and the part their colours and forms play in that process, must have been

felt by poets of the lower school as almost an outrage; yet to a Browning these discoveries serve only to awaken ideas and set up trains of thought of infinitely more value, as being in harmony with the spirit of nature, than they could have ever imagined who only thought of the redness of the rose and the blueness of the violet as adjuncts with the graces of their form to make the fields and woods look pretty.

He is in sympathy with those who can tell us what is the hidden meaning of the "objects that throng our youth." "We see and hear, and do not wonder much."

> "As German Bœhme never cared for plants
> Until it happed, a walking in the fields,
> He noticed all at once that plants could speak,
> Nay, turned with loosened tongue to talk with him.
> That day the daisy had an eye indeed—
> Colloquised with the cowslip on such scenes!"
>
> (Vol. v. p. 208.)

It is not demanded of the poet that he should ignore the beauty of the rainbow till he has studied Fraunhofer's lines. What we do say is, that neither the scientist alone nor the poet alone comprehend Nature till they borrow from each other—the one the reverence and the worship, the other the learning and loving study, that, united, make up the true spirit in which she is to be approached. In Robert Browning there is the happiest combination of these requisites.

He has learned with delight how the human brain enshrines its mysteries in its myriad cells, where thought is born and memory treasures her precious records; of the marvellous mechanism of our limbs, with their cords and pulleys and facile play; of the eye, that with insatiable activity supplies the brain with its impressions of the world around us; of the musical instrument of ten thousand strings, played on by the air-pulsations that arouse the sense of hearing to activity every moment of our waking lives.

In a very beautiful passage in *Ferishtah* (p. 76) he makes the Creator address man thus—

> "Wherefore did I contrive for thee that ear
> Hungry for music, and direct thine eye
> To where I hold a seven-stringed instrument,
> Unless I meant thee to beseech me play?"

Here, of course, the reference is to the organ of Corti in the internal ear, with its 3,000 arches, its keys ranged like those of a piano, aptly described by the poet as "hungry for music." The seven-stringed instrument, I need not say, is light and the seven colours of the spectrum.

It is nothing wonderful that he should know such easily-acquired facts; it *is* wonderful that they should be transfigured by the magic of his art. Yet he imparts his secret to the attentive reader. It is his deep love of the law and harmony of nature. His process has been that Henry Taylor describes as his own: "Observation of facts; generalisation from facts observed; rejection into the concrete, but with improvements from the fancy, of the general conclusions obtained."

The more thoroughly the lover of Nature is skilled in the knowledge of her laws, the greater will be the intellectual pleasure with which he will contemplate them; and the poet who can follow Nature into her secret chambers, and commune with her on her deepest phenomena, will be the poet who has the noblest things to say to the human soul. The poet who can interpret for us the "great symphony of organic harmony composed in the forest key," as Mr. Mivart terms it, speaking of the vegetable world of the Brazils—of the recently-discovered harmonious relations of the ocean and its submerged wealth of wondrous beauty, will be the poet of the future who will come into a closer relationship with man than has ever been reached before. So far from the fascination of Nature being dispelled by our completer knowledge of her laws, it has been a hundred fold increased by the revelation of glories before undreamed of, which are none the less resplendent because we know their origin. How science and poetry can blend in one harmonious spirit, students of Henry Thoreau need not be told.

By science in this connection I do not mean merely mental science, without which a poet could not hope "to loop back the veil." We know how versed in this was Shakespeare. Coleridge speaks of "Shakespeare's deep and accurate science in mental philosophy." No one will deny, I presume, this characteristic to Robert Browning, but I claim something more than this for him. I maintain that in his works he exhibits a deep and earnest sympathy with all branches of human knowledge dealing with the causes and connections of natural phenomena—in other words, with what we term the physical sciences. Now this is essentially an age pre-eminent for the investigation of such causes and connections; yet I think we may say that in its atmosphere there is nothing that need stunt and dwarf the spirit of poetry. I do not quite see with Mr. Radford, in his remarks on Mr. Bury's paper, "that the language of poetry and science are diametrically opposed." They need not use the same language of course, but I can see no reason for opposition between the spirit of poetry and that of science. Poetry and the physical

sciences flourished together in the Greek intellect, and though perhaps as far as modern times are concerned, till the advent of Haller and Goethe, the scientific and the poetic minds had not been blended, we have in Goethe a grand example of the genus, and in Browning, as I think, we have the noble forerunner of a new, strong race of poets of the first order, the interpreters of the inquiring analytical soul of the age, in which no subject is too sacred to be questioned. No; were the physical sciences, like our factory chimneys, to exhale a breath poisonous to the surrounding flora of the poet's fancy, as some have thought, we should be terrible losers by all our advancement in the productive arts, and Mr. Ruskin's lament over our decadence be more than justified. The spirit of the age has dissolved the legend of William Tell, and taken some of the romance out of the Tell country, but it has given it a magnificent railway, which in a few hours brings the flowers and fruits of Italy to cheerless London slums.

The poet of the future will see more romance in that fact than in many time-honoured legends. He will have to sing to us of the modern Spirit of the Alps—Professor Tyndall, in his chalet questioning the rainbow, the glacier, the avalanche, and the mountain mist, and storm. The dragons are gone, and the knights that slew them live only in legendary tales; but the Epidemiologist, in his laboratory, doing battle with the germs of cholera and typhus, is a not less noble theme for the poet of the nineteenth century, though an artist might not think the subject would look so well on his canvas. It was a poet, Lucretius, who eighteen hundred years ago anticipated the atomic theory. We owe him a debt of gratitude for proving in his own person that poetry is not incompatible with science, and that it is quite possible for a man to investigate the laws of nature without blinding his vision to the loveliness of the ideal world. He sang the reign of law in the universe, that our misery or our happiness was not dependent on the caprice of the gods, but on the nature of things. This man was the true poet, *the creator*, and it has taken the world eighteen centuries to prove as facts what his prophetic spirit foresaw. We live now in an age of technical accuracy. The time of the poet's licence is past, and poetry, if not now scientifically accurate, is to us of this age foolishness. Some one has said that a poet who was not mad was no poet at all. If Mr. Browning has any madness, it is in his method, never in his matter. His is emphatically the sound mind in the sound body, he is the poet of downright common sense; his imagination never runs away with him, though possibly it is exhausted in his style. Scientific students of Browning must often think what a

scientist he would have made, just as readers of Professor Tyndall are always exclaiming, "Here is the poet of science!" Hear what he himself says of the experimental philosopher: "He lives a life of the senses, using his hands, eyes, and ears in his experiments, but is constantly being carried beyond the margin of the senses. His mind must realise the subsensible world, and possess a pictorial power; if the picture so formed be correct, the phenomena he is investigating are accounted for. Imagination with him does not sever itself from the world of fact; this is the storehouse from which all its pictures are drawn, and the magic of its art consists not in creating things anew, but in so changing the magnitude, position, and other relations of sensible things as to fit them for the requirements of the intellect in the subsensible world." Poets have been allowed to exercise a riotous power in dealing capriciously with facts. But if a well-ordered and disciplined scientific method restrain this riot and caprice, I don't think the result is any the less true poetry. Perhaps the fact that Browning is restrained by his science from playing havoc with phenomena may account for the *un*restrained riot and caprice of his words. On Tyndall's theory this may really be Browning's safety-valve.

Christopher North and the Ettrick shepherd in the twenty-second of the *Noctes Ambrosianæ* so exactly and admirably place the question in its proper light, that I may be pardoned if I quote a few sentences.

The shepherd asks, "What think ye, sir, o' the dogmas that high imagination is incompatible wi' high intellect, and that as science flourishes poetry decays?"

North replies, "The dogmata of dunces beyond the reach of redemption. A man may have a high intellect with little or no imagination; but he cannot have a high imagination with little or no intellect. The intellect of Homer, Dante, Milton, or Shakespeare, was higher than that of Aristotle, Newton, and Bacon. When elevated by feeling into imagination, their intellect becomes transcendent, and thus were they poets, the noblest name by far and away that belongs to any of the children of men. What is science? True knowledge of mind and matter, as far as it is permitted to us to know anything truly of the world without and the world within us, congenial in their co existence. What is poetry? The true exhibition in musical and metrical speech of the thoughts of humanity when coloured by its feelings throughout the whole range of the physical, moral, intellectual, and spiritual regions of its being. Poetry and science are identical—or rather, that as imagination is the highest

kind of intellect, so poetry is the highest kind of science. It is only in an age of science that anything worthy the name of poetry can exist. In a rude age there may be bursts of passion—of imagination even, which, if you insist on calling them poetry, I am willing so to designate; in that case, almost all human language is poetry. Will any antiquary or archæologist show me a bit of poetry as broad as the palm of my hand worth the toss up of a tinker's farthing the produce of uncivilised man? Not till man and nature and human life lie in the last light of science—that is, of knowledge and of truth—will poetry reach the acme of its triumph. As Campbell sings—

> "'Come, bright Improvement, on the car of Time,
> And rule the spacious world from clime to clime,'

and still poetry will be here below Prime Minister and High Priest of Nature."

People say that when we have solved all the mysteries of Nature the sentiment will be all gone and poetry die out, and therefore the phrase "scientific poet" is a contradiction in terms. The cynical philosopher who, when his wife cried for the first time in his presence with the hope of softening his heart in the direction of a milliner's bill, assured her that tears would not move him in the least as he knew their exact constituents, and was not going to waste his money on account of an exhibition of a solution of phosphate and muriate of soda—though probably a good chemist had not enough intellect to raise him to poetry, and there is no reason to suppose that the knowledge that lightning is electricity will destroy the grandeur of an Alpine storm, or that cloud forms, the play of light and colour on a mountain side, or the dew-drops on a leaf, will cease to be poetical because their causes are well understood. The tear-drops in the eye of a beautiful woman will surely not be less beautiful because we are "familiarly acquainted with the perfected philosophy of all secretions."

Now it is because, from a careful study of Mr. Browning's works, I have come to the conclusion that the poet is intimately acquainted with the physical sciences that I hold him to be for this very reason so much the more a great poet—the greatest living poet; he can touch us the closer because he knows more about us than we know ourselves, more about our environments, more about the phenomena that encircle our lives. We yield ourselves up to him; our secret thoughts are not hid from him, he knows our anatomy to the backbone. It is his character of all-roundness that makes him excel. He knows everything; if we can't understand him it is because we

know so much less than he. He is always right. Often he appears unintelligible. One ransacks dictionaries and encyclopædias; it is they that are defective, not Browning wanting. And all this amazing wealth of learning sits so easily on him that he wears it as if he had been born in it, and, to me, at least, he never appears pedantic. Are you a lawyer? he talks to you as if he had been all his life in the long robe; a physician? you never had a professor of medicine so close at your heart as Paracelsus; a theologian? he has all the wisdom of the Schoolmen and the love of John himself, and so with all his students he is in closer touch than any other poet since Shakespeare the divine. The artist loves him as a brother of the pencil, the musician claims him of his kin, and the scientist, opening his works where he will, sees in every line intimations that here is the master of all others who can hold council with him on equal terms, and finds in him a brother to rejoice with him and "triumph o'er each secret wrung from Nature's cold reserve." This is an immense claim to make, but it can be sustained, and its very immensity serves to explain the slow but steady progress our poet has made past all lower niches towards the highest seats where the gods are.

Carlyle demanded of a truly great man that he must be all sorts of men, and had little respect for "poets who could only sit on chairs and compose stanzas"—Browning must have gone to his heart. Not in the sense satirised in "the Loves of the triangles" or "the Loves of the plants" is our poet all this to us, but in the fact that he has so largely imbibed and assimilated the science of the time that almost every page of his works is permeated by its influence. Sometimes this is shewn by a word or two that passes unnoticed by a reader who is not familiar with the ideas the word calls up, as, for instance, in the lines:—

> "The child feels God a moment,
> Ichors o'er the place, plays on and grows to be a man like us."

In the expression, "ichors o'er the place" is found a beautiful illustration from the physiology of repair in injured skin surfaces and the pathology of wounds. As the cicatrix closes up the cut flesh so does the child's mind become case-hardened after the first effects of the awfulness of the Infinite One's apprehended presence have passed away. The time soon comes when "God is not in all his thoughts."

In some cases we have an actual statement of a scientific truth in so many words, as in *Sordello*:—

> "A soul—above his soul
> Power to uplift his power,—this moon's control
> Over the sea depths." (P. 187.)

And again—

"Wherefore doubt
That love meet for such strength, some moon without
Would match his sea?"

(P. 189.)

Sometimes he is actually technical as in some lines of Prince Hohenstiel Schwangau (p. 45)—

"Try to make good do good as evil does—
Were just as if a chemist, wanting white,
And knowing black ingredients bred the dye,
Insisted these too should be white forsooth."

His optimism is always cropping up, and it is not surprising he should cull illustrations from chemistry which abounds in examples of good and beautiful things produced from worthless and ugly substances. The lovely series of aniline dyes made from coal tar, for instance, might surely afford a scientific poet of an optimistic turn of mind some help in this direction. In the lines just quoted the idea that to get the highest good we must have some evil amongst the ingredients is not elaborated; but those who are only slightly acquainted with chemical manipulations will not want more than the poet's hint to see the force of his theory.

He states the same truth in another form in Pietro—

"Fair and good are products—of Foul and Evil: one must bring to pass the other.
Just as poisons grow drugs, steal through sundry odd ducts
Doctors name, and ultimately issue safe and changed.
You'd abolish poisons, treat disease with dainties
Such as suit the sound and sane? With all such kickshaws vain you pother!
Arsenic's the stuff puts force into the faint eyes,
Opium sets the brain to rights—by cark and care deranged."

In that sublime poem *Easter Day* (p. 191) there is a very remarkable instance of Mr. Browning's way of wrapping up a great scientific truth in two or three words, and leaving it without recurring to it, or drawing attention to the force of the illustration by elaboration of the idea. Browning never beats his nuggets into leaf—it is rather in its very concentration that his force exists.

"Thy choice was earth: thou didst attest
'Twas fitter spirit should subserve
The flesh, than flesh refine to nerve
Beneath the spirit's play."

How many thousands of readers have passed over these most remarkable lines and missed all their force and beauty, because, unlike the author of them who seems to have a perfectly voracious appetite for facts, they did not know they contained a precise statement of the

origin of the nervous system according to our greatest physiologists. *Easter Day* was I think written in Florence in 1850. I believe it was not till 1855 that Herbert Spencer published his *Principles of Psychology*, and therein speculated on the evolution of the first rudiments of a nervous system in Medusæ and other low types of animal life; his speculations having since to some extent been confirmed by the investigations of Romanes and Eimer. Herbert Spencer points out how an impression or stimulus comes to habitually traverse a certain path along the lines of least resistance, thus leading to a differentiation of the protoplasm. Bastian, in his *Brain as an Organ of the Mind* (p. 21), says, "Wherever external impressions produce molecular movements which traverse with frequency some definite path, the transference of such movements is made easier by each repetition, and there is a tendency to the initiation of a structural change along this path. Ultimately by the constant repetition of such a process we should have the gradual formation of an actual 'Nerve fibre.'"

Now I know of no writer anterior to Mr. Spencer who suggested this as the process by which nerves are formed, yet Mr. Browning—in a highly concentrated manner it is true—but still actually seems to have anticipated the great and interesting discovery.

In *Numpholeptos* (p. 97) these lines occur—

> "as flash may find
> The inert nerve, sting awake the palsied limb."

The reference is to the use made of electricity in medical science, and the fact that by its aid a paralysed muscle can be restored to its normal condition. No reader of Browning can have failed to remark how great an accumulator of facts he is—facts of all sorts, and from every conceivable and out of the way place. Odd scraps of lore here and there on every possible subject demonstrate that nothing in the range of human learning is beneath his notice or unworthy of being treasured in his storehouse; this is essentially the scientific habit of mind, and this habit has largely contributed to his greatness. Voltaire said, "There can be no great poetry without great wisdom," and Horace had said it before him. Although it is true enough that the poet is born and not made, it is equally true, as Carpenter says, "that the imaginative faculty may be directed and invigorated, cultivated and chastened by volitional effort." Mr. Browning's industry it is that makes him so difficult to the careless reader.

If at times he is unintelligible it is because he knows so much more than we do. The automatic action of our faculties is in direct proportion to their exercise, and it is because Browning has travelled

over so vast a range of subjects, getting at the soul of all things, and analysing the deepest things of man, he has become to us the seer and the sayer of the abysmal things of life and their awfullest mysteries. He knew what was required of him. "A poet must be earth's essential king," he declares. He who aspires to the poet's crown needs everything. "Red, green, and blue that whirl into a white, the variance now, the essential unity which makes the miracle." And this reminds me that Browning makes very great use throughout his works of similes derived from his study of light. Here are a few—

> "Rather learn and love, each facet flash of the revolving year!
> Red, green and blue that whirl into a white."
>
> (*Ring and Book*, vol. i. p. 71.)

> "Only the prism's obstruction shows aright
> The secret of a sunbeam, breaks its light
> Into the jewelled bow from blankest white;
> So may a glory from defect arise!"
>
> (Vol. vi. 151.)

Again—

> "Lights thwarted, breaks
> A limpid purity of rainbow flakes."
>
> (*Sordello*, p. 170.)

Self-sacrifice he terms losing "the varicolor in achromatic white." (*Fifine*, 65.)

The singularly beautiful poem *Numpholeptos* owes its remarkable imagery to the figure of light rays decomposed by gems, the perfect white of the diamond sending forth prismatic colours, and these again traced back to their source leading to the pure cold moonbeam. So the pure white silver light of the loved one rays forth blood-streaks sun warmth, sun light, and salvation.

> "Warms the soul, it sweetens, softens.
> 'What fairy track do I explore?
> What magic hall return to, like the gem,
> Centuply angled o'er a diadem,
> You dwell there, heated; from your midmost home
> Rays forth—through that fantastic world I roam
> Ever—from centre to circumference,
> Shaft upon coloured shaft,' this crimsons thence
> That purples out its præcinct through the waste.
> Surely I had your sanction what I faced,
> Fared forth upon that untried yellow ray,
> Whence I retrack my steps?
>
> . . . . .
>
> Irradiation, late triumphant through the distance finds its fate
> Merged in your pure blank soul, alike the source and tomb of that prismatic glow."
>
> (*Numpholeptos*, p. 101.)

As a commentary on this suggestive poem consider the influence the study of the life and character of the Virgin Mary has had on the minds of millions of men and women. The pure moonbeam of her smile has proved to this a path of gold, "for gold means love," to another many a daring crimson, blood-red path of passionate devotion, such as filled that Spanish knight of Isabella's, who braved the fury of the Moor, and wrote Our Lady's name over the portals of the mosque at Granada. To how many others a violet path of humble service and devotion! A pure ideal once dowered to the world has never merely rested in its gem-like, faceted beauty, but has brought forth bright and glorious paths of colour that have filled our souls with every kind of grace and loveliness. The conception of the idea of Our Lady, though it were founded in no historic basis of fact, has done the work of the faceted gem to beautify all that came within the scope of its glory. We owe this exquisite illustration to Browning's study of decomposed rays of light, and their recomposition into complete or white light. In Professor Tyndall's address on the Scientific Limit of the Imagination he tells us that "two thirds of the rays emitted by the sun fail to arouse in the eye the sense of vision. The rays exist, but the visual organ requisite for their translation into light does not exist. And so from this region of darkness and mystery which surrounds us rays may now be darting which require but the development of the proper intellectual organs to translate them into knowledge as far surpassing ours as ours surpasses that of the wallowing reptiles which once held possession of this planet."

Mr. Browning in *Jochanan Hakkadosh* (125) states the same truth in other words, words that I think we shall understand all the better after those of Professor Tyndall:—

> "O Thou Almighty who canst re-instate
> Truths in their primal charity, confused
> By man's perception, which is man's and made
> To suit his service,—how, once disabused
> Of reason which sees light half shine half shade,
> Because of flesh, the medium that adjusts
> Purity to his visuals, both an aid
> And hindrance,—how to eyes earth's air encrusts,
> When purged and perfect to receive truth's beam
> Pouring itself on the new sense it trusts
> With all its plenitude of power,—how seem
> Then, the intricacies of shade, of shine,
> Oppugnant natures—Right and Wrong, we deem
> Irreconcilable? O eyes of mine,
> Freed now of imperfection, ye avail
> To see the whole sight."

Embryologists tell us that man in his development in the embryo passes through the fish, reptile, bird, and mammiferous quadruped, till it ultimately arrives at the human stage. Hugh Miller remarks the same thing of the development of the human brain; in succession we have the brain of the inferior natures till the unique character of the human brain is assumed. And if we carefully study the origin of mind in the lower animals we shall find there is scarcely an attribute possessed by man, scarcely a virtue or faculty that in a more or less crude and undeveloped form, is not found in the creatures beneath us. We open our Browning and find he knows all about it. It is not new to him that "man is the sum total of all the animals."

In *Paracelsus* (189), he says there are:

> "Imperfect qualities throughout creation
> Suggesting some one creature yet to make,
> Some point where all those scattered rays should meet
> Convergent in the faculties of man.
> . . . . .
> Hints and previsions of which faculties
> Are strewn confusedly everywhere about
> The inferior natures, and all lead up higher,
> All shape out dimly the superior race,
> The heir of hopes too fair to turn out false
> And man appears at last."

And just as inferior brains and natures point to the advent of man, so did the early brain and nature of primeval man foreshadow the higher and nobler man, and so do now the powers and potentialities of our highest races point on, ever forward, to the man that is to be—

> "Progress is the law of life, man is not man as yet."
> "But in completed man begins anew
> A tendency to God." "For God is glorified in man."
> (*Paracelsus*, pp. 190, 191.)

If there be any who hold that "man is Nature's crowning blunder," our poet is not of their number.

From Browning's earliest to his latest work we may gather hundreds of examples such as we have quoted to show how deeply science has tinctured his thought and how heartily he is imbued with its love. In *Pauline*, which in one sense is a prelude to *Paracelsus*, he again and again recurs to the theme so grandly elaborated in the latter work of the consecration of a soul to knowledge, one in whom was

> "A principle of restlessness
> Which would be all, have, see, know, taste, feel, all."

> "This restlessness of passion meets in me
> A craving after knowledge."

As in *Paracelsus*, so in *Pauline*, the lesson for us is, knowledge must never be pursued at the expense of love.

With Browning it is ever love first, all things for love; but how deep is his sympathy for the knowledge cult his way of urging the lesson proves clearly enough. It is in *Paracelsus* (the work that posterity will probably estimate as Browning's greatest) that we must look for the strongest proof of his sympathy with man's desire to know and bend the forces of nature to his service. To some students this magnificent work will appear only the string of pearls and precious stones that some of us consider *Sordello* to be. To others it is a drama illustrating the contending forces of love and knowledge, others again find in it only an elaborate discussion on the Aristotelian and Platonic systems of philosophy; it is none of these alone; rather, if a single sentence could describe it, it is the Epic of the Healer, not of the hero who stole from heaven a jealously-guarded fire, but of him who won from heaven what was waiting for a worthy recipient to take and help us to. In so far as Parcelsus came short it was deficiency of love that hindered him; of his striving after knowledge and what he won for man, the epic tells in words and music that to me at least have no equal in the whole range of literature. At its full value does the poet appreciate the God in man, the knowing Spirit which man is only now beginning to dare look in the face, dreaded by theologians and hated by all the Churches, from the Eden legend to the last Encyclical the story is ever the same. Knowledge is dangerous to man and faith is all. In Paracelsus the thing condemned is not knowledge without faith but knowledge without love, to

> "Know, not for knowing's sake,
> But to become a star to men for ever;
> Know for the gain it gets, the praise it brings,
> The wonder it inspires."

Paracelsus has a message for our time. The tragedy of knowing without loving is often enacted now, and where the intellect is dissevered from the heart the end will be hard to keep from madness.

Wisdom demanded of Paracelsus—

> "Wilt thou adventure for my sake and man's
> Apart from all reward?"

If the man of science cannot inscribe on his banner "Apart from all reward," he is not fit to enter the service of man. Says Tyndall: "Imagine Dr. Draper spending his days in blowing soap-bubbles and in studying their colours! Be it remembered it was thus that

minds like those of Boyle, Newton, and Hooke were occupied and that on such experiments has been founded a theory the issues of which are incalculable."—Tyndall, *Light*, 66.

The World knows little of the work done by men who long to

> "Save mankind,
> To make some unexampled sacrifice
> In their behalf, to wring some wondrous good
> From heaven or earth for them, to perish, winning
> Eternal weal in the act; as who should dare
> Pluck out the angry thunder from its cloud,
> That, all its gathered flame discharged on him
> No storm might threaten summer's azure sleep!"
>
> (*Paracelsus*, p. 62.)

Yet in a thousand laboratories and students' cells this is being done at the present moment by men who have "all our varied appetites for joy derived from common things." "Men whom every common pleasure of the world affects as ourselves," but who "dare aspire to *know*—that in itself alone shall its reward be, not an alien end blending therewith!"

It is most remarkable that long before the scientific men of our time had given Paracelsus credit for the noble work he did for mankind, and the lasting boon many of his discoveries conferred upon the race, Mr. Browning, in this wonderful poem, recognised both his work and its results at their true value, and raised his reputation at this late hour from the infamy his enemies and biographers had covered it with, and set him in his proper place amongst the heroes and martyrs of science. We owe the poet a debt of gratitude for this rehabilitation. No man could have written this transcendent poem who had less than Browning's power of thrusting aside the accidents and accretions of a character, and getting at the naked germ from which springs the life of the real man. That no follower of medicine, no chemist, no disciple of science, did this for Paracelsus is, in the splendid light of Mr. Browning's research and penetration, a remarkable instance of the fact that the unjust verdicts of a time and a class need to be reversed in a clearer atmosphere, and in freedom from class prejudice not often accorded to contemporary biographers. A poet alone could never have done us this service, and a single attentive perusal of this work is enough to show that the intimate blending of the scientific with the poetic faculty could alone have effected the restoration. How lovingly the poet has taken this world's-benefactor's remains from the ditch into which his profession had cast them and laid them in his own beautiful sepulchre, gemmed, chiselled, and arabesqued by all the lovely

imagery of his fancy, no reader of Browning's *Paracelsus* needs to be told.

It might have been a Sir Charles Bell who wrote the lines on the Human Hand. Browning must have a knowledge of its structure more than skin-deep.

> " Flesh and bone and nerve that make
> The poorest, coarsest human hand
> An object worthy to be scanned
> A whole life long for their sole sake."
> (*James Lee's Wife.*)

Of the painter who is an anatomist he says—

> " To him the bones their inmost secret yield,
> Each notch and nodule signify their use ;
> On him the muscles turn, in triple tier,
> And pleasantly entreat the entrusted man :
> ' Familiarize thee with our play that lifts
> Here, and then lowers again, leg, arm, and foot ! '
> —Ensuring due correctness in the nude."

Even the mysterious technicalities of a medical prescription are not hidden from our poet; he knows the principles upon which an intelligent physician proceeds, when he writes one—

> " Ask, now, a doctor for a remedy !
> There's his prescription. Bid him point you out
> Which of the five or six ingredients saves
> The sick man. ' Such the efficacity ?
> Then why not dare and do things in one dose
> Simple and pure, all virtue, no alloy
> Of the idle drop and powder ? ' What's his word ?
> The efficacity, neat were neutralised ;
> It wants dispersing and retarding,—nay,
> Is put upon its mettle, plays its part
> Precisely through such hindrance everywhere.
> Finds some mysterious give and take i' the case
> Some gain by opposition, he foregoes
> Should he unfetter the medicament."
> (*Prince H. S.*, p. 78.)

I will not trouble you with explaining how accurate this is, but I may say it is a precise statement of the methods that guide the pharmacologist, and affords the poet an admirable illustration of the method of our education and development in a world of contending forces and a pilgrimage of dangers and difficulties that, rightly met, subserve perhaps the highest interests the Great All-Father had in view for us when He placed us in their midst.

Browning's optimism is in complete accord with the teachings of science. James Hinton, in one of his pregnant sentences, says,

"Every evil, every failure or loss, becomes tributary to a greater good."

Browning declares that—

"Evil's beautified in every shape."

"Upon men's own account must evil stay."

"For mankind springs salvation by each hindrance interposed, they climb."

Pessimism has no place in his system of philosophy.

"Time means amelioration, tardily enough displayed,
Yet a mainly onward moving, never wholly retrograde."
(*La Saisaz.*)

As the unused muscle wastes away, the unexercised brain daily grows feebler and feebler, and all the powers of man's body demand exercise if they are to be retained in their integrity, so, in Browning's system, Evil is our stimulus, whereby we evolve all the good we can hope to get from this our life.

The character of Count Guido, in the *Ring and the Book*, is drawn with scientific accuracy, and is elaborated with precision and great skill. He has the true aspect of the ingrained villain, a man who could not help being one. A jury, composed of nineteenth century Royal Academicians and physicians would have consigned him to a criminal lunatic asylum. I am sorry we have not his skull on the table to-night. You would have found the facial angle extremely small, and doubtless some very interesting facts accounting for his character could have been discovered. Count Guido has left us his picture, painted by himself :

"Wipe out the being of me
And smear my soul from off the white of things I blot ;
I am one huge and sheer mistake.
Whose fault? Not mine, at least,
Who did not make myself."

Pompilia's sketch gives us his photograph :

"Guido Franceschini—old
And nothing like so tall as I myself,
Hook-nosed and yellow in a bush of beard,
Much like a thing I saw on a boy's wrist,
He called an owl and used for catching birds."

No doubt the family history of the Count would give us some adequate reasons for concluding that he was in very truth "one huge and sheer mistake."

There is nothing "miraculous" (as has been said) in the stainless purity and beauty of Pompilia's character. The poet's abounding

faith in Nature, his optimism and faithful observation of character have drawn for us in Pompilia a lovely but by no means an impossible picture. Her character, we are told, taken in connection with her surroundings and parentage is marvellous. As we do not read that her father was an habitual drunkard, or that her mother was a subject of the strumous diathesis or a microcephalic idiot, the marvel is not very apparent to the scientific mind. Her mother followed the calling of a washerwoman, and was probably a well-developed, healthy person.

Now, given good development and initial vitality at its best, Nature is very successful in continuing the species on the highest lines, quite regardless of ecclesiastical ceremonies or parochial registrations. Disclaiming any, the least desire to undervalue the importance of either, many reasons might be given why Nature so often uses such material with triumphant success; certain it is that those who have the best reasons for knowing, often find Pompilias in very unlikely surroundings. To those who often become weary of trying to elevate other minds to their own level, it should be a source of satisfaction that it is well-nigh as difficult to efface the image of the Divine in man as to restore it when obscured by vicious habits and evil tendencies, for which their possessors cannot always fairly be held responsible. After all, education and environment do not effect so much either of good or evil as we often suppose. Otherwise in the homes of the brutal, the sensual and degraded, we should not find so many bright, innocent and pure natures; nor in the families of the high born and cultivated so many degraded types.

To some temperaments it is just as difficult to be evil as to others to be pure and good.

The characters of Guido and Pompilia are then perfectly natural. When the soul of Pompilia came within the path of Guido's, we find the repulsion that evil ever has for good.

> "And when he took my hand and made a smile—
> Why—the uncomfortableness of it all."

Bad men are often repugnant to good dogs.

To the man who refuses to believe in God, because he cannot find Him with his telescope, and whose microscope reveals Him not, Robert Browning declares—

> "The name comes close behind a stomach cyst
> The simplest of creations. . . . .
> . . . . The small becomes the dreadful and immense."
> (*Sludge*, p. 203.)

To him who will not believe in soul because his scalpel cannot detect it, he says show me first an atom! Immortality incredible? Your atom is a truly immortal being!

In one of the finest passages in *Ferishtah's Fancies* he discusses this difficulty the materialist has to face.

> "To know of, think about—
> Is all man's sum of faculty effects
> When exercised on earth's least atom, Son!
> What was, what is, what may such atom be?
> No answer! Still, what seems it to man's sense?
> An atom with some certain properties
> Known about, thought of as occasion needs,
> —Man's—but occasions of the universe?
> Unthinkable, unknowable to man.
> Yet, since to think and know fire through and through
> Exceeds man, is the warmth of fire unknown,
> Its uses—are they so unthinkable?
> Pass from such obvious power to powers unseen,
> Undreamed of save in their sure consequence!
> Take that, we spoke of late, which draws to ground
> The staff my hand lets fall: it draws, at least—
> Thus much man thinks and knows, if nothing more."
>
> (*Ferishtah*, p. 131.)

When we reflect how infinitely little we know of these atoms here spoken of, and of that mysterious force of gravitation, and the medium through which it acts, referred to in the last lines, it is not surprising we should be unable to solve the greater problems of life, the soul and God.

If it be contrary to received notions that in Browning we have a scientific poet, is it not still more remarkable that in a scientific man we have faith in some at least of the great doctrines of the Christian religion?

Would not his dissecting, analysing spirit prove a solvent for creeds? If we knew him less we might almost predicate this of him. Nothing, however, could be more contrary to the fact. Again and again he warns us that we must not put religion into an alembic, must not resolve faith into its elements, analyse the pearl of great price, pump all the air out of the great Christian verities. In a word, he tells us "a scientific faith's absurd—frustrates the very end it was meant to serve" (vol. v. p. 170).

"You must mix some uncertainty with faith, if you would have faith be" (vol. v. p. 168).

He complains of the "exhausted air-bell of the critic"—that it "leaves no air to poison" (vol. v. p. 149).

Consequently none to breathe, "pumps out with ruthless ingenuity atom by atom, and leaves you—vacuity."

Tells us of the Göttingen professor, who, with strange inconsistency, but exactly as our Comtist and Agnostic philosophers are always doing—

> "Had done his best
> And the pearl of price, at reason's test,
> Lay dust and ashes levigable
> On the Professor's lecture table.
> When we looked for the influence and monition
> That our faith, reduced to such condition
> Be swept forthwith to its natural dust-hole,—
> He bids us, when we least expect it,
> Take back our faith,—if it be not just whole
> Yet a pearl indeed, as his tests affect it."
>
> (Vol. v. p. 156.)

Which is exactly what our new lights are doing with Christianity—grinding it to an impalpable powder, and bidding us take the greatest care to sweep up what they have left and religiously conserve it. But fine dust is not a pearl, and carbon, hydrogen, and oxygen in pint measures are not exactly a loaf of bread. We cannot adorn ourselves with the one, nor feed ourselves with the other. Browning tells us—

> "The originals of faith . . . .
> The causes were they caught and catalogued
> Would too distract, too desperately foil
> Enquirer. How may analyst reduce
> Quantities to exact their opposites
> Value to zero, then bring zero back
> To value of supreme preponderance?
> How substitute thing meant for thing expressed?"
>
> (*Red Cotton*, p. 196.)

Yet he has some words of stern rebuke for Religion that remind us of Dr. Draper framing his terrible indictment against her for her constant opposition to Science. How she sat:

> "Prim in place Religion overlooked
> And so had done till doomsday, never a sign
> Nor sound of interference from her mouth,"

while the rack pulled bone from bone, and the followers of Science were mauled and maimed. When Science became too strong for Religion longer to suppress, after first looking around for help not forthcoming, Religion acquiesced:

> "What! broken is the rack? Well done of thee?
> Did I forget to abrogate its use
> Be the mistake in common with us both!"

And the indignant poet turns upon her and cries :

> " Ah, but, Religion, did we wait for thee
> To ope the book. . . . .
> We should wait indeed !
> That is all history."
>
> (*Ring and Book*, vol. i. p. 52.)

I saw once in Madrid, a few hundred yards from the scenes of the mediæval Autos da Fé, a ballet, *The Genius of Progress contending with Superstition.* In one scene a priest incites the people to destroy the first steam-boat and its inventor. That done, in the next Progress waved her wand, and a Mississippi water-palace bore her thousand passengers on the wave. I thought of Browning and the lines in Pietro, how "the priests came prying, broke his engine up, and bastinadoed him beside."

But if we culled from the works of Mr. Browning all the passages that prove the permeation of his mind by the scientific habit, we should weary you, even if we have not already done so. The passages quoted are ample to show that whatever our notions of poets and poetry may be in relation to Science, we have in Browning a writer who is abreast of the highest culture of his time, who clothes hard dry facts of Science in highly poetical language, and invests their conception with all the glamour of his art, extracting from a soil usually considered unpromising luxuriant growths of most exquisite fancy, and above and beyond all this, one who, in his own terse and pregnant lines, has told us we may—

> " Confidently lay to heart, and lock in head our life-long this
> He there with the brand flamboyant, broad o'er night's forlorn abyss ;
> Crowned by verse, and wielding, with wits' bauble, learning's rod,
> Well ? Why he at least believed in soul, was very sure of God."

APPENDIX.

It has been thought advisable to append some references to Mr. Browning's method of dealing with scientific matters, that readers may have an opportunity both of seeing how wide is the poet's acquaintance with such things, and judge for themselves what is his attitude toward Science in general. The list of references makes no pretension to be an exhaustive one—it could be considerably amplified by a careful reperusal of the works—but it will suffice for the purpose :—

Anatomy.—Poems, v., p. 152 ; vi., p. 58. Fifine, p. 68.

Astronomy.—Prince H. S., p. 90. Sordello, pp. 187, 188.

Botany.—Poems, i., p. 104 ; v., pp. 193, 208, 228, 312. Fifine, p. 14. Sordello, p. 20.

Chemistry.—Poems, iii., pp. 219, 220 ; iv., p. 238 ; v., pp. 155, 156. Prince H. S., pp. 44, 91. Red Cotton, p. 196. Croisic, pp. 90, 92. Fifine, pp. 65, 97, 130 ; Ferishtah, pp. 39, 40, 45, 76. Pippa P., p. 250. Sordello, p. 194. Ring and Book, i., p. 2.

Electricity.—Poems, vi., pp. 183, 203. Red Cotton, p. 196. Fifine, p. 115.

Evolution.—Poems, i., p. 188. Prince H. S., p. 68. Fifine, p. 162. La Saisaz, p. 57.

Light.—Poems, iii., p. 170. Jocoseria, p. 124. Fifine, pp. 65, 29. Numpholeptos, p. 101. Ring and Book, i., p. 71 ; iii., p. 170 ; iv., pp. 57, 79.

Materia Medica and Therapeutics.—Pietro of Abano, p. 84. Prince H. S., p. 77. Paracelsus, p. 111.

Medicine.—Poems, iv., p. 273 ; v., p. 220 ; Dramatic Idylls, ii., preface ; Red Cotton, p. 199 ; Ferishtah, pp. 27, 55, 56. Ring and Book, iv., p. 12.

Pharmacy.—Poems, iii., p. 96 ; v., p. 220.

Physiology.—Poems, v., p. 191. Sordello, p. 195. Tray.

Scientific Matters in General.—Poems, v., pp. 128, 302 ; vi., p. 203. Dramatic Idylls, ii., p. 68. Fifine, pp. 51, 86. La Saisaz, pp. 69, 82. Ferishtah, p. 131. Sordello, pp. 25, 203 ; Ring and Book, iv., pp. 61, 77, 180.

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