

VARIOUS

ECLECTIC MAGAZINE OF
FOREIGN LITERATURE,
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Literature, Science, and Art**

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MOUNTAIN OBSERVATORIES

On October 1st, 1876, one of the millionaires of the New World died at San Francisco. Although owning a no more euphonious name than James Lick, he had contrived to secure a future for it. He had founded and endowed the first great astronomical establishment planted on the heights, between the stars and the sea. How he came by his love of science we have no means of knowing. Born obscurely at Fredericksburg, in Pennsylvania, August 25th, 1796, he amassed some 30,000 dollars by commerce in South America, and in 1847 transferred them and himself to a village which had just exchanged its name of Yerba Buena for that of San Francisco, situate on a long, sandy strip of land between the Pacific and a great bay. In the hillocks and gullies of that wind-blown barrier he invested his dollars, and never did virgin soil yield a richer harvest. The gold-fever broke out in the spring of 1848. The unremembered cluster of wooden houses, with no trouble or tumult of population in their midst, nestling round a tranquil creek under a climate which, but for a touch of sea-fog, might rival that of the Garden of the Hesperides, became all at once a centre of attraction to the outcast and adventurous from every part of the world. Wealth poured in; trade sprang up; a population of six hundred increased to a quarter of a million; hotels, villas, public edifices, places of business spread, mile after mile, along the bay; building-ground rose to a fabulous price, and James Lick found himself one of the richest men in the United States.

Thus he got his money; we have now to see how he spent it. Already the munificent benefactor of the learned institutions of California, he in 1874 formally set aside a sum of two million dollars for various public purposes, philanthropic, patriotic, and scientific. Of these two millions 700,000 were appropriated to the erection of a telescope “superior to, and more powerful than any ever yet made.” But this, he felt instinctively, was not enough. Even in astronomy, although most likely unable to distinguish the Pole-star from the Dog-star, this “pioneer citizen” could read the signs of the times. It was no longer instruments that were wanted; it was the opportunity of employing them. Telescopes of vast power and exquisite perfection had ceased to be a rarity; but their use seemed all but hopelessly impeded by the very conditions of existence on the surface of the earth.

The air we breathe is in truth the worst enemy of the astronomer’s observations. It is their enemy in two ways. Part of the sight which brings its wonderful, evanescent messages across inconceivable depths of space, it stops; and what it does not stop, it shatters. And this even when it is most transparent and seemingly still; when mist-veils are withdrawn, and no clouds curtain the sky. Moreover, the evil grows with the power of the instrument. Atmospheric troubles are magnified neither more nor less than the objects viewed across them. Thus, Lord Rosse’s giant reflector possesses —*nominally*— a magnifying power of 6,000; that is to say, it can reduce the *apparent* distances of the heavenly bodies to 1/6000 their *actual* amount. The moon, for example, which is in reality separated from the earth’s surface by an interval of about 234,000 miles, is shown as if removed only thirty-nine miles. Unfortunately, however, in theory only. Professor Newcomb compares the sight obtained under such circumstances to a glimpse through several yards of running water, and doubts whether our satellite has ever been seen to such advantage as it would be if brought — substantially, not merely optically — within 500 miles of the unassisted eye.¹

¹ Popular Astronomy, p. 145.

Must, then, all the growing triumphs of the optician's skill be counteracted by this plague of moving air? Can nothing be done to get rid of, or render it less obnoxious? Or is this an ultimate barrier, set up by Nature herself, to stop the way of astronomical progress? Much depends upon the answer – more than can, in a few words, be easily made to appear; but there is fortunately reason to believe that it will, on the whole, prove favorable to human ingenuity, and the rapid advance of human knowledge on the noblest subject with which it is or ever can be conversant.

The one obvious way of meeting atmospheric impediments is to leave part of the impeding atmosphere behind; and this the rugged shell of our planet offers ample means of doing. Whether the advantages derived from increased altitudes will outweigh the practical difficulties attending such a system of observation when conducted on a great scale, has yet to be decided. The experiment, however, is now about to be tried simultaneously in several parts of the globe.

By far the most considerable of these experiments is that of the "Lick Observatory." Its founder was from the first determined that the powers of his great telescope should, as little as possible, be fettered by the hostility of the elements. The choice of its local habitation was, accordingly, a matter of grave deliberation to him for some time previous to his death. Although close upon his eightieth year, he himself spent a night upon the summit of Mount St. Helena with a view to testing its astronomical capabilities, and a site already secured in the Sierra Nevada was abandoned on the ground of climatic disqualifications. Finally, one of the culminating peaks of the Coast Range, elevated 4,440 feet above the sea, was fixed upon. Situated about fifty miles south-east of San Francisco, Mount Hamilton lies far enough inland to escape the sea-fog, which only on the rarest occasions drifts upward to its triple crest. All through the summer the sky above it is limpid and cloudless; and though winter storms are frequent, their raging is not without highly available lucid intervals. As to the essential point – the quality of telescopic vision – the testimony of Mr. S. W. Burnham is in the highest degree encouraging. This well-known observer spent two months on the mountain in the autumn of 1879, and concluded, as the result of his experience during that time – with the full concurrence of Professor Newcomb – that, "it is the finest observing location in the United States." Out of sixty nights he found forty-two as nearly perfect as nights can well be, seven of medium quality, and only eleven cloudy or foggy;² his stay, nevertheless, embraced the first half of October, by no means considered to belong to the choice part of the season. Nor was his trip barren of discovery. A list of forty-two new double stars gave an earnest of what may be expected from systematic work in such an unrivalled situation. Most of these are objects which never rise high enough in the sky to be examined with any profit through the grosser atmosphere of the plains east of the Rocky Mountains; some are well-known stars, not before seen clearly enough for the discernment of their composite character; yet Mr. Burnham used the lesser of two telescopes – a 6-inch and an 18-inch achromatic – with which he had been accustomed to observe at Chicago.

The largest refracting telescope as yet actually completed has a light-gathering surface 27 inches in diameter. This is the great Vienna equatorial, admirably turned out by Mr. Grubb, of Dublin, in 1880, but still awaiting the commencement of its exploring career. It will, however, soon be surpassed by the Pulkowa telescope, ordered more than four years ago on behalf of the Russian Government from Alvan Clark and Sons, of Cambridgeport, Massachusetts. Still further will it be surpassed by the coming "Lick Refractor." It is safe to predict that the optical championship of the world is, at least for the next few years, secured to this gigantic instrument, the completion of which may be looked for in the immediate future. It will have a clear aperture of *three feet*. A disc of flint-glass for the object-lens, 38.18 inches across, and 170 kilogrammes in weight, was cast at the establishment of M. Feil, in Paris, early in 1882. Four days were spent and eight tons of coal consumed in the casting

² The Observatory, No. 43, p. 613.

of this vast mass of flawless crystal; it took a calendar month to cool, and cost 2,000*l*.³ It may be regarded as the highest triumph so far achieved in the art of optical glass-making.

A refracting telescope three feet in aperture collects rather more light than a speculum of four feet.⁴ In this quality, then, the Lick instrument will have – besides the Rosse leviathan, which, for many reasons, may be considered to be out of the running – but one rival. And over this rival – the 48-inch reflector of the Melbourne observatory – it will have all the advantages of agility and robustness (so to speak) which its system of construction affords; while the exquisite definition for which Alvan Clark is famous will, presumably, not be absent.

Already preparations are being made for its reception at Mount Hamilton. The scabrous summit of “Observatory Peak” has been smoothed down to a suitable equality of surface by the removal of 40,000 tons of hard trap rock. Preliminary operations for the erection of a dome, 75 feet in diameter, to serve as its shelter, are in progress. The water-supply has been provided for by the excavation of great cisterns. Buildings are rapidly being pushed forward from designs prepared by Professors Holden and Newcomb. Most of the subsidiary instruments have for some time been in their places, constituting in themselves an equipment of no mean order. With their aid Professor Holden and Mr. Burnham observed the transit of Mercury of November 7th, 1881, and Professor Todd obtained, December 6th, 1882, a series of 147 photographs (of which seventy-one were of the highest excellence) recording the progress of Venus across the face of the sun.

We are informed that a great hotel will eventually add the inducement of material well-being to those of astronomical interest and enchanting scenery. No more delightful summer resort can well be imagined. The road to the summit, of which the construction formed the subject of a species of treaty between Mr. Lick and the county of Santa Clara in 1875, traverses from San José a distance, as a bird flies, of less than thirteen miles, but doubled by the windings necessary in order to secure moderate gradients. So successfully has this been accomplished, that a horse drawing a light waggon can reach the observatory buildings without breaking his trot.⁵ As the ascending track draws its coils closer and closer round the mountain, the view becomes at every turn more varied and more extensive. On one side the tumultuous coast ranges, stooping gradually to the shore, magnificently clad with forests of pine and red cedar; the island-studded bay of San Francisco, and, farther south, a shining glimpse of the Pacific; on the other, the thronging pinnacles of the Sierras – granite needles, lava-topped bastions – fire-rent, water-worn; right underneath, the rich valleys of Santa Clara and San Joaquin, and, 175 miles away to the north (when the sapphire of the sky is purest), the snowy cone of Mount Shasta.

Thus, there seems some reason to apprehend that Mount Hamilton, with its monster telescope, may become one of the show places of the New World. *Absit omen!* Such a desecration would effectually mar one of the fairest prospects opened in our time before astronomy. The true votaries of Urania will then be driven to seek sanctuary in some less accessible and less inviting spot. Indeed, the present needs of science are by no means met by an elevation above the sea of four thousand and odd feet, even under the most translucent sky in the world. Already observing stations are recommended at four times that altitude, and the ambition of the new species of climbing astronomers seems unlikely to be satisfied until he can no longer find wherewith to fill his lungs (for even an astronomer must breathe), or whereon to plant his instruments.

This ambition is no casual caprice. It has grown out of the growing exigencies of celestial observation.

From the time that Lord Rosse’s great reflector was pointed to the sky in February, 1845, it began to be distinctly felt that instrumental power had outrun its opportunities. To the sounding of

³ Nature, vol. xxv. p. 537.

⁴ Silvered glass is considerably more reflective than speculum-metal, and Mr. Common’s 36-inch mirror can be but slightly inferior in luminous capacity to the Lick objective. It is, however, devoted almost exclusively to celestial photography, in which it has done splendid service. The Paris 4-foot mirror bent under its own weight when placed in the tube in 1875, and has not since been remounted.

⁵ E. Holden, “The Lick Observatory,” Nature, vol. xxv. p. 298.

further depths of space it came to be understood that Atlantic mists and tremulous light formed an obstacle far more serious than any mere optical or mechanical difficulties. The late Mr. Lassell was the first to act on this new idea. Towards the close of 1852 he transported his beautiful 24-inch Newtonian to Malta, and, in 1859-60, constructed, for service there, one of four times its light capacity. Yet the chief results of several years' continuous observation under rarely favorable conditions were, in his own words, "rather negative than positive."⁶ He dispelled the "ghosts" of four Uranian moons which had, by glimpses, haunted the usually unerring vision of the elder Herschel, and showed that our acquaintance with the satellite families of Saturn, Uranus, and Neptune must, for the present at any rate, be regarded as complete; but the discoveries by which his name is chiefly remembered were made in the murky air of Lancashire.

The celebrated expedition to the Peak of Teneriffe, carried out in the summer of 1856 by the present Astronomer Royal for Scotland, was an experiment made with the express object of ascertaining "how much astronomical observation can be benefited by eliminating the lower third or fourth part of the atmosphere."⁷ So striking were the advantages of which it seemed to hold out the promise, that we count with surprise the many years suffered to elapse before any adequate attempt was made to realize them.⁸ Professor Piazzzi Smyth made his principal station at Guajara, 8,903 feet above the sea, close to the rim of the ancient crater from which the actual peak rises to a further height of more than 3,000 feet. There he found that his equatorial (five feet in focal length) showed stars fainter by *four magnitudes* than at Edinburgh. On the Calton Hill the companion of Alpha Lyræ (eleventh magnitude) could never, under any circumstances, be made out. At Guajara it was an easy object twenty-five degrees from the zenith; and stars of the fourteenth magnitude were discernible. Now, according to the usual estimate, a step downwards from one magnitude to another means a decrease of lustre in the proportion of two to five. A star of the fourteenth order of brightness sends us accordingly only 1/39th as much light as an average one of the tenth order. So that, in Professor Smyth's judgment, the grasp of his instrument was virtually *multiplied thirty-nine times* by getting rid of the lowest quarter of the atmosphere.⁹ In other words (since light falls off in intensity as the square of the distance of its source increases), the range of vision was more than sextupled, further depths of space being penetrated to an extent probably to be measured by thousands of billions of miles!

This vast augmentation of telescopic compass was due as much to the increased tranquillity as to the increased transparency of the air. The stars hardly seemed to twinkle at all. Their rays, instead of being broken and scattered by continual changes of refractive power in the atmospheric layers through which their path lay, travelled with relatively little disturbance, and thus produced a far more vivid and concentrated impression upon the eye. Their images in the telescope, with a magnifying power of 150, showed no longer the "amorphous figures" seen at Edinburgh, but such minute, sharply-defined discs as gladden the eyes of an astronomer, and seem, in Professor Smyth's phrase, to "provoke" (as the "cocked-hat" appearance surely baffles) "the application of a wire-micrometer" for the purposes of measurement.¹⁰

The lustre of the milky way and zodiacal light at this elevated station was indescribable, and Jupiter shone with extraordinary splendor. Nevertheless, not even the most fugitive glimpse of any of his satellites was to be had without optical aid.¹¹ This was possibly attributable to the prevalent

⁶ Monthly Notices, R. Astr. Soc. vol. xiv. p. 133 (1854).

⁷ Phil. Trans. vol. cxlviii. p. 455.

⁸ Captain Jacob unfortunately died August 16, 1862, when about to assume the direction of a hill observatory at Poonah.

⁹ The height of the mercury at Guajara is 21·7 to 22 inches.

¹⁰ Phil. Trans. vol. cxlviii. p. 477.

¹¹ We are told that three American observers in the Rocky Mountains, belonging to the Eclipse Expedition of 1878, easily saw Jupiter's satellites night after night with the naked eye. That their discernment is possible, even under comparatively disadvantageous circumstances is rendered certain by the well-authenticated instance (related by Humboldt, "Cosmos," vol. iii. p. 66, Otte's trans.) of a tailor named Schön, who died at Breslau in 1837. This man habitually perceived the first and third, but never could see the second

“dust-haze”, which must have caused a diffusion of light in the neighborhood of the planet more than sufficient to blot from sight such faint objects. The same cause completely neutralized the darkening of the sky usually attendant upon ascents into the more ethereal regions, and surrounded the sun with an intense glare of reflected light. For reasons presently to be explained, this circumstance alone would render the Peak of Teneriffe wholly unfit to be the site of a modern observatory.

Within the last thirty years a remarkable change, long in preparation,¹² has conspicuously affected the methods and aims of astronomy; or, rather, beside the old astronomy – the astronomy of Laplace, of Bessel, of Airy, Adams, and Leverrier – has grown up a younger science, vigorous, inspiring, seductive, revolutionary, walking with hurried or halting footsteps along paths far removed from the staid courses of its predecessor. This new science concerns itself with the *nature* of the heavenly bodies; the elder regarded exclusively their *movements*. The aim of the one is *description*, of the other *prediction*. This younger science inquires what sun, moon, stars, and nebulae are made of, what stores of heat they possess, what changes are in progress within their substance, what vicissitudes they have undergone or are likely to undergo. The elder has attained its object when the theory of celestial motions shows no discrepancy with fact – when the calculus can be brought to agree perfectly with the telescope – when the courses of the heavens come strictly up to time, and their observed places square to a hair’s-breadth with their predicted places.

It is evident that very different modes of investigation must be employed to further such different objects; in fact, the invention of novel modes of investigation has had a prime share in bringing about the change in question. Geometrical astronomy, or the astronomy of position, seeks above all to measure with exactness, and is thus more fundamentally interested in the accurate division and accurate centering of circles than in the development of optical appliances. Descriptive astronomy, on the other hand, seeks as the first condition of its existence to *see* clearly and fully. It has no “method of least squares” for making the best of bad observations – no process for eliminating errors by their multiplication in opposite directions; it is wholly dependent for its data on the quantity and quality of the rays focussed by its telescopes, sifted by its spectroscopes, or printed in its photographic cameras. Therefore, the loss and disturbance suffered by those rays in traversing our atmosphere constitute an obstacle to progress far more serious now than when the exact determination of places was the primary and all-important task of an astronomical observer. This obstacle, which no ingenuity can avail to remove, may be reduced to less formidable dimensions. It may be diminished or partially evaded by anticipating the most detrimental part of the atmospheric transit – by carrying our instruments upwards into a finer air – by meeting the light upon the mountains.

The study of the sun’s composition, and of the nature of the stupendous processes by which his ample outflow of light and heat is kept up and diffused through surrounding space, has in our time separated, it might be said, into a science apart. Its pursuit is, at any rate, far too arduous to be conducted with less than a man’s whole energies; while the questions which it has addressed itself to answer are the fundamental problems of the new physical astronomy. There is, however, but one opinion as to the expediency of carrying on solar investigations at higher altitudes than have hitherto been more than temporarily available.

The spectroscope and the camera are now the chief engines of solar research. Mere telescopic observation, though always an indispensable adjunct, may be considered to have sunk into a secondary position. But the spectroscope and the camera, still more than the telescope, lie at the mercy of atmospheric vapors and undulations. The late Professor Henry Draper, of New York, an adept in the art of celestial photography, stated in 1877 that two years, during which he had photographed the moon at his observatory on the Hudson on every moonlit night, yielded *only three* when the

or fourth Jovian moons.

¹² Sir W. Herschel’s great undertakings, Bessel remarks (“Populäre Vorlesungen,” p. 15), “were directed rather towards a physical description of the heavens, than to astronomy proper.”

air was still enough to give good results, nor even then without some unsteadiness; and Bond, of Cambridge (U. S.) informed him that he had watched in vain, through no less than seventeen years for a faultless condition of our troublesome environing medium.¹³ Tranquillity is the first requisite for a successful astronomical photograph. The hour generally chosen for employing the sun as his own limner is, for this reason, in the early morning, before the newly emerged beams have had time to set the air in commotion, and so blur the marvellous details of his surface-structure. By this means a better definition is secured but at the expense of transparency. Both are, at the sea-level, hardly ever combined. A certain amount of haziness is the price usually paid for exceptional stillness, so that it not unfrequently happens that astronomers see best in a fog, as on the night of November 15th, 1850, when the elder Bond discovered the “dusky ring” of Saturn, although at the time no star below the fourth magnitude could be made out with the naked eye. Now on well-chosen mountain stations, a union of these unhappy divorced conditions is at certain times to be met with, opportunities being thus afforded with tolerable certainty and no great rarity, which an astronomer on the plains might think himself fortunate in securing once or twice in a lifetime.

For spectroscopic observations at the edge of the sun, on the contrary, the *sine qua non* is translucency. During the great “Indian eclipse” of August 18th, 1868, the variously colored lines were, by the aid of prismatic analysis, first described, which reveal the chemical constitution of the flamelike “prominences,” forming an ever-varying, but rarely absent, feature of the solar surroundings. Immediately afterwards, M. Janssen, at Guntoor, and Mr. Norman Lockyer, in England, independently realised a method of bringing them into view without the co-operation of the eclipsing moon. This was done by *fanning out* with a powerfully dispersive spectroscope the diffused radiance near the sun, until it became sufficiently attenuated to permit the delicate flame-lines to appear upon its rainbow-tinted background. This mischievous radiance – which it is the chief merit of a solar eclipse to abolish during some brief moments – is due to the action of the atmosphere, and chiefly of the watery vapors contained in it. Were our earth stripped of its “cloud of all-sustaining air,” and presented, like its satellite, bare to space, the sky would appear perfectly black up to the very rim of the sun’s disc – a state of things of all others (vital necessities apart) the most desirable to spectroscopists. The best approach to its attainment is made by mounting a few thousand feet above the earth’s surface. In the drier and purer air of the mountains, “glare” notably diminishes, and the tell-tale prominence-lines are thus more easily disengaged from the effacing lustre in which they hang, as it were suspended.

The Peak of Teneriffe, as we have seen, offers a marked exception to this rule, the impalpable dust diffused through the air giving, even at its summit, precisely the same kind of detailed reflection as aqueous vapors at lower levels. It is accordingly destitute of one of the chief qualifications for serving as a point of vantage to observers of the new type.

The changes in the spectra of chromosphere and prominences (for they are parts of a single appendage) present a subject of unsurpassed interest to the student of solar physics. There, if anywhere, will be found the key to the secret to the sun’s internal economy; in them, if at all, the real condition of matter in the unimaginable abysses of heat covered up by the relatively cool photosphere, whose radiations could, nevertheless, vivify 2,300,000,000 globes like ours, will reveal itself; revealing, at the same time, something more than we know of the nature of the so-called “elementary” substances, hitherto tortured, with little result, in terrestrial laboratories.

The chromosphere and prominences might be figuratively described as an ocean and clouds of tranquil incandescence, agitated and intermingled with waterspouts, tornadoes, and geysers of raging fire. Certain kinds of light are at all times emitted by them, showing that certain kinds of matter (as, for instance, hydrogen and “helium”¹⁴) form invariable constituents of their substance. Of these

¹³ Am. Jour. of Science, vol. xiii. p. 89.

¹⁴ The characteristic orange line (D₃) of this unknown substance, has recently been identified by Professor Palmieri in the spectrum

unfailing lines Professor Young counts eleven.¹⁵ But a vastly greater number appear only occasionally, and, it would seem, capriciously, under the stress of eruptive action from the interior. And precisely this it is which lends them such significance; for of what is going on there, they have doubtless much to tell, were their message only legible by us. It has not as yet proved so; but the characters in which it is written are being earnestly scrutinised and compared, with a view to their eventual decipherment. The prodigious advantages afforded by high altitudes for this kind of work were illustrated by the brilliant results of Professor Young's observations in the Rocky Mountains during the summer of 1872. By the diligent labor of several years he had, at that time, constructed a list of one hundred and three distinct lines occasionally visible in the spectrum of the chromosphere. In seventy-two days, at Sherman (8,335 feet above the sea), it was extended to 273. Yet the weather was exceptionally cloudy, and the spot (a station on the Union Pacific Railway, in the Territory of Wyoming) not perhaps the best that might have been chosen for an "astronomical reconnaissance."¹⁶

A totally different kind of solar research is that in aid of which the Mount Whitney expedition was organized in 1881. Professor S. P. Langley, director of the Alleghany observatory in Pennsylvania, has long been engaged in the detailed study of the radiations emitted by the sun; inventing, for the purpose of its prosecution, the "bolometer,"¹⁷ an instrument twenty times as sensitive to changes of temperature as the thermopile. But the solar spectrum as it is exhibited at the surface of the earth, is a very different thing from the solar spectrum as it would appear could it be formed of sunbeams, so to speak, *fresh from space*, unmodified by atmospheric action. For not only does our air deprive each ray of a considerable share of its energy (the total loss may be taken at 20 to 25 per cent. when the sky is clear and the sun in the zenith), but it deals unequally with them, robbing some more than others, and thus materially altering their relative importance. Now it was Professor Langley's object to reconstruct the original state of things, and he saw that this could be done most effectually by means of simultaneous observations at the summit and base of a high mountain. For the effect upon each separate ray of transmission through a known proportion of the atmosphere being (with the aid of the bolometer) once ascertained, a very simple calculation would suffice to eliminate the remaining effects, and thus virtually secure an extra-atmospheric post of observation.

The honor of rendering this important service to science was adjudged to the highest summit in the United States. The Sierra Nevada culminates in a granite pile, rising, somewhat in the form of a gigantic helmet, fronting eastwards, to a height of 14,887 feet. Mount Whitney is thus entitled to rank as the Mount Blanc of its own continent. In order to reach it, a railway journey of 3,400 miles, from Pittsburg to San Francisco, and from San Francisco to Caliente, was a brief and easy preliminary. The real difficulty began with a march of 120 miles across the arid and glaring Inyo desert, the thermometer standing at 110° in the shade (if shade there were to be found.) Towards the end of July 1881, the party reached the settlement of Lone Pine at the foot of the Sierras, where a camp for low-level observations was pitched (at a height, it is true, of close upon 4,000 feet), and the needful instruments were unpacked and adjusted. Close overhead, as it appeared, but in reality sixteen miles distant, towered the gaunt, and rifted, and seemingly inaccessible pinnacle which was the ultimate goal of their long journey. The illusion of nearness produced by the extraordinary transparency of the air was dispelled when, on examination with a telescope, what had worn the aspect of patches of moss, proved to be extensive forests.

of lava from Vesuvius – a highly interesting discovery, if verified.

¹⁵ The Sun, p. 193.

¹⁶ R. D. Cutts, "Bulletin of the Philosophical Society of Washington," vol. i. p. 70.

¹⁷ This instrument may be described as an electric balance of the utmost conceivable delicacy. The principle of its construction is that the conducting power of metals is diminished by raising their temperature. Thus, if heat be applied to one only of the wires forming a circuit in which a galvanometer is included, the movement of the needle instantly betrays the disturbance of the electrical equilibrium. The conducting wires or "balance arms" of the bolometer are platinum strips 1/120th of an inch wide and 1/25000 of an inch thick, constituting metallic *antennae* sensitive to the chill even of the fine dark lines in the solar spectrum, or to changes of temperature estimated at 1/100000 of a degree Centigrade.

The ascent of such a mountain with a train of mules bearing a delicate and precious freight of scientific apparatus, was a perhaps unexampled enterprise. It was, however, accomplished without the occurrence, though at the frequent and imminent risk, of disaster, after a toilsome climb of seven or eight days through an unexplored and, to less resolute adventurers, impassable waste of rocks, gullies, and precipices. Finally a site was chosen for the upper station on a swampy ledge, 13,000 feet above the sea; and there, notwithstanding extreme discomforts from bitter cold, fierce sunshine, high winds, and, worst of all, “mountain sickness,” with its intolerable attendant debility, observations were determinedly carried on, in combination with those at Lone Pine, and others daily made on the highest crest of the mountain, until September 11. They were well worth the cost. By their means a real extension was given to knowledge, and a satisfactory definiteness introduced into subjects previously involved in very wide uncertainty.

Contrary to the received opinion, it now appeared that the weight of atmospheric absorption falls upon the upper or blue end of the spectrum, and that the obstacles to the transmission of light waves through the air diminish as their length increases, and their refrangibility consequently diminishes. A yellow tinge is thus imparted to the solar rays by the imperfectly transparent medium through which we see them. And, since the sun possesses an atmosphere of its own, exercising an unequal or “selective” absorption of the same character, it follows that, if both these dusky-red veils were withdrawn, the true color of the photosphere would show as a very distinct *blue*¹⁸ – not merely *bluish*, but a real azure just tinted with green, like the hue of a mountain lake fed with a glacier stream. Moreover, the further consequence ensues, that the sun is hotter than had been supposed. For the higher the temperature of a glowing body, the more copiously it emits rays from the violet end of the spectrum. The blueness of its light is, in fact, a measure of the intensity of its incandescence. Professor Langley has not yet ventured (that we are aware of) on an estimate of what is called the “effective temperature” of the sun – the temperature, that is, which it would be necessary to attribute to the surface of the radiating power of lamp-black to enable it to send us just the quantity of heat that the sun does actually send us. Indeed, the present state of knowledge still leaves an important hiatus – only to be filled by more or less probable guessing in the reasoning by which inferences on this subject must be formed; while the startling discrepancies between the figures adopted by different, and equally respectable, authorities sufficiently show that none are entitled to any confidence. The amount of heat received in a given interval of time by the earth from the sun is, however, another matter, and one falling well within the scope of observation. This Professor Langley’s experiments (when completely worked out) will, by their unequalled precision, enable him to determine with some approach to finality. Pouillet valued the “solar constant” at 1.7 “calories”; in other works, had calculated that, our atmosphere being supposed removed, vertical sunbeams would have power to heat in each minute of time, by one degree centigrade, 1.7 gramme of water for each square centimetre of the earth’s surface. This estimate was raised by Crova to 2.3, and by Violle in 1877 to 2.5;¹⁹ Professor Langley’s new data bring it up (approximately as yet) to three calories per square centimetre per minute. This result alone would, by its supreme importance to meteorology, amply repay the labors of the Mount Whitney expedition.

Still more unexpected is the answer supplied to the question: Were the earth wholly denuded of its aëriform covering, what would be the temperature of its surface? We are informed in reply that it would be *at the outside* 50 degrees of Fahrenheit below zero, or 82 of frost. So that mercury would remain solid even when exposed to the rays – undiminished by atmospheric absorption – of a tropical sun at noon.²⁰ The paradoxical aspect of this conclusion – a perfectly legitimate and reliable one –

¹⁸ Defined by the tint of the second hydrogen-line, the bright reversal of Fraunhofer’s F. The sun would also seem – adopting a medium estimate – three or four times as brilliant as he now does.

¹⁹ *Annales de Chimie et de Physique*, t. x. p. 360.

²⁰ S. P. Langley, “Nature,” vol. xxvi. p. 316.

disappears when it is remembered that under the imagined circumstances there would be absolutely nothing to hinder radiation into the frigid depths of space, and that the solar rays would, consequently, find abundant employment in maintaining a difference of 189 degrees²¹ between the temperature of the mercury and that of its environment. What we may with perfect accuracy call the *clothing function* of our atmosphere is thus vividly brought home to us; for it protects the teeming surface of our planet against the cold of space exactly in the same way as, and much more effectually than, a lady's sealskin mantle keeps her warm in frosty weather. That is to say, it impedes radiation. Or, again, to borrow another comparison, the gaseous envelope we breathe in (and chiefly the watery part of it) may be literally described as a "trap for sunbeams." It permits their entrance (exacting, it is true, a heavy toll), but almost totally bars their exit. It is now easy to understand why it is that on the airless moon no vapors rise to soften the hard shadow-outlines of craters or ridges throughout the fierce blaze of the long lunar day. In immediate contact with space (if we may be allowed the expression) water, should such a substance exist on our enigmatical satellite, must remain frozen, though exposed for endless æons of time to direct sunshine.

Amongst the most noteworthy results of Professor Langley's observations in the Sierra Nevada was the enormous extension given by them to the solar spectrum in the invisible region below the red. The first to make any detailed acquaintance with their obscure beams was Captain Abney, whose success in obtaining a substance – the so-called "blue bromide" of silver – sensitive to their chemical action, enabled him to derive photographic impressions from rays possessing the relatively great wave-length of 1,200 millionths of a millimetre. This, be it noted, approaches very closely to the theoretical limit set by Cauchy to that end of the spectrum. The information was accordingly received with no small surprise that the bolometer showed entirely unmistakable heating effects from vibrations of the wave-length 2,800. The "dark continent" of the solar spectrum was thus demonstrated to cover an expanse nearly eight times that of the bright or visible part.²² And in this newly discovered region lie three-fifths of the entire energy received from the sun – three-fifths of the vital force imparted to our planet for keeping its atmosphere and ocean in circulation, its streams rippling and running, its forests growing, its grain ripening. Throughout this wide range of vibrations the modifying power of our atmosphere is little felt. It is, indeed, interrupted by great gaps produced by absorption *somewhere*; but since they show no signs of diminution at high altitudes, they are obviously due to an extra-terrestrial cause. Here a tempting field of inquiry lies open to scientific explorers.

On one other point, earlier ideas have had to give way to better grounded ones derived from this fruitful series of investigation. Professor Langley has effected a redistribution of energy in the solar spectrum. The maximum of heat was placed by former inquirers in the obscure tract of the infra-red; he has promoted it to a position in the orange approximately coincident with the point of greatest luminous intensity. The triple curve, denoting by its three distinct summits the supposed places in the spectrum of the several maxima of heat, light, and "actinism," must now finally disappear from our text-books, and with it the last vestige of belief in a corresponding threefold distinction of qualities in the solar radiations. From one end to the other of the whole gamut of them, there is but one kind of difference – that of wave-length, or frequency in vibration; and there is but one curve by which the rays of the spectrum can properly be represented – that of energy, or the power of doing work on material particles. What the effect of that work may be, depends upon the special properties of such material particles, not upon any recondite faculty in the radiations.

These brilliant results of a month's bivouac encourage the most sanguine anticipation as to the harvest of new truths to be gathered by a steady and well-organized pursuance of the same plan of operations. It must, however, be remembered that the scheme completed on Mount Whitney had been

²¹ Sir J. Herschel's estimate of the "temperature of space" was 239°F.; Pouillet's 224°F. below zero. Both are almost certainly much too high. See Taylor, "Bull. Phil. Soc. Washington," vol. ii. p. 73; and Croll, "Nature," vol. xxi, p. 521.

²² This is true only of the "normal spectrum," formed by reflection from a "grating" on the principle of interference. In the spectrum produced by refraction, the red rays are *huddled together* by the distorting effect of the prism through which they are transmitted.

carefully designed, and in its preliminary parts executed at Alleghany. The interrogatory was already prepared; it only remained to register replies, and deduce conclusions. Nature seldom volunteers information: usually it has to be extracted from her by skilful cross-examination. The main secret of finding her a good witness consists in having a clear idea beforehand what it is one wants to find out. No opportunities of seeing will avail those who know not what to look for. Thus, not the crowd of casual observers, but the few who consistently and systematically *think*, will profit by the effort now being made to rid the astronomer of a small fraction of his terrestrial impediments. It is, nevertheless, admitted on all hands that no step can at present be taken at all comparable in its abundant promise of increased astronomical knowledge to that of providing suitably elevated sites for the exquisite instruments constructed by modern opticians.

Europe has not remained behind America in this significant movement. An observatory on Mount Etna, at once astronomical, meteorological, and seismological, was nominally completed in the summer of 1882, and will doubtless before long begin to give proof of efficiency in its threefold capacity. The situation is magnificent. Etna has long been famous for the amplitude of the horizon commanded from it and the serenity of its encompassing skies favors celestial no less than terrestrial vision. Professor Langley, who made a stay of twenty days upon the mountain in 1879-80, with the object of reducing to strict measurement the advantages promised by it, came to the conclusion that the “seeing” there is better than that in England (judging from data given by Mr. Webb) in the proportion of three to two – that is to say, a telescope of two inches aperture on Etna would show as much as one of three in England. Yet the circumstances attending his visit were of the least favorable kind. He was unable to find a suitable shelter higher up than Casa del Bosco, an isolated hut within the forest belt (as its name imports), at considerably less than half the elevation of the new observatory; the imperfect mounting of his telescope rendered observation all but impossible within a range of 30 degrees from the zenith, thus excluding the most serene portion of the sky; moreover, his arrival was delayed until December 25th, when the weather was thoroughly broken, high winds were incessantly troublesome, and only five nights out of seventeen proved astronomically available. It is, accordingly, reassuring to learn that while, with the naked eye, at ordinary levels, he could see but six Pleiades, with glimpses of a seventh and eighth, on Etna he steadily distinguished nine even before the moon had set;²³ and that the telescopic definition though not uniformly good, was on December 31st such as he had never before seen on the sun, “least of all with a blue sky;”²⁴ the “rice-grain” structure came out beautifully under a power of 212; and for the spectroscopic examination of prominences, the fainter orange light of their helium constituent served almost equally well with the strong radiance of the crimson ray of hydrogen (C) – a test of transparency which those accustomed to such studies will appreciate.

The Etnean observatory is the most elevated building in Europe. It stands at a height above the sea of 9,655 ft., or 1,483 ft. above the monastery of the Great St. Bernard. Its walls enclose the well-known “Casa Inglese,” where travellers were accustomed to spend the night before undertaking the final ascent of the cone, and occupy a site believed secure from the incursions of lava. Astronomical work is designed to be carried on there from June to September. For the Merz equatorial, 35 centimetres (13·8 inches) in aperture, which is *facile primus* of its instrumental equipment, a duplicate mounting has been provided at Catania, whither it will be removed during the winter months. The primary aim of the establishment is the study of the sun. Its great desirability for this purpose formed the theme of the representations from Signor Tacchini (then director of the observatory of Palermo, now of that of the Collegio Romano), which determined the Italian government upon trying the experiment. But we hear with pleasure that stellar spectroscopy will also come in for a large share of attention. The privilege of observation from the summit of Etna will not be enjoyed exclusively by the

²³ Am. Jour. of Science, vol. xx. p. 36.

²⁴ Am. Jour. of Science, vol. xx. p. 41.

local staff. The Municipality of Catania who have borne their share in the expense of the undertaking, generously propose to give it somewhat of an international character, by providing accommodation for any foreign astronomers who may desire to enjoy a respite from the hampering conditions of low-level star-gazing. We cannot doubt that such exceptional facilities will be turned to the best account.

Eight years have now passed since General de Nansonty, aided by the engineer Vaussenat, established himself for the winter on the top of the Pic du Midi. Zeal for the promotion of weather-knowledge was the impelling motive of this adventure, which included, amongst other rude incidents, a snow-siege of little less than six months. It resulted in crowning one of the highest crests of the Pyrenees with a permanent meteorological observatory opened for work in 1881. It is now designed to render the station available for astronomical purposes as well.

The important tasks in progress at the Paris observatory have of late been singularly impeded by bad weather. During the latter half of 1882 scarcely four or five good nights per month were secured, and in December these were reduced to two.²⁵ Moreover, M. Thollon, who, according to his custom, arrived from Nice in June for the summer's work, returned thither in September without having found the opportunity of making *one single* spectroscopic observation. Yet within easy and immediate reach was a post, already in scientific occupation, where as General de Nansonty reported, ordinary print was legible by the radiance of the milky way and zodiacal light alone, and fifteen or sixteen Pleiades could be counted with the naked eye. At length Admiral Mouchez, the energetic director of the Paris observatory, convinced of the urgent need of an adjunct establishment under less sulky skies, issued to MM. Thollon and Trépiéd a commission of inquiry into telescopic possibilities on the Pic du Midi. Their stay lasted from August 17th, to September 22d, 1883, and their experiences were summarised in a note (preliminary to a detailed report) published in the "Comptes Rendus" for October 16th, glowing with a certain technical enthusiasm difficult to be conveyed to those who have never strained their eyes to catch the vanishing gleam of a "chromospheric line" through a "milky" sky, and dim and tremulous air. The definition, they declared, was simply marvellous. Not even in Upper Egypt had they seen anything like it. The sun stood out, clean-cut and vivid, on a dark blue sky, and so slight were the traces of diffusion, that, for observations at his edge the conditions approached those of a total eclipse. These advantages are forcibly illustrated by the statement that, instead of eight lines ordinarily visible in the entire spectrum of the chromosphere, more than thirty revealed themselves in the orange and green parts of it alone (D to F)! A fact still more remarkable is that prominences were actually seen, and their forms distinguished, though foreshortened and faint, on the very disc of the sun itself – and this not merely by such glimmering views as had previously, at especially favorable moments, tantalised the sight of Young and Tacchini, but steadily and with certainty. We are further told that, on the mornings of September 19th and 20th, Venus was discerned, without aid from glasses, within two degrees of the sun.

These extraordinary facilities of vision disappeared, indeed, as, with the advance of day, the slopes of the mountain became heated and set the thin air quivering; but were reproduced at night in the tranquil splendor of moon and stars.

The expediency of using such opportunities was obvious; and it has accordingly been determined to erect a good equatorial in this tempting situation, elevated 9,375 feet above the troubles of the nether air. The expense incurred will be trifling; no special staff will be needed; the post will simply constitute a dependency of the Paris establishment, where astronomers thrown out of work by the malice of the elements may find a refuge from enforced idleness, as well as, possibly, unlooked-for openings to distinction.

We must now ask our readers to accompany us in one more brief flight across the Atlantic. After a successful observation of the late transit of Venus at Jamaica, Dr. Copeland, the chief astronomer of Lord Crawford's observatory at Dun Echt, took advantage of the railway which now crosses

²⁵ Report of the Paris Observatory, "Astronomical Register," Oct. 1883; and "Observatory," No. 75.

the Western Andes at an elevation of 14,666 feet, to make a high-level tour of exploration in the interests of science. Some of the results communicated by him to the British Association at Southport last year, and published, with more detail, in the astronomical journal “Copernicus,” are extremely suggestive. At La Paz, in Bolivia, 12,050 feet above the sea, a naked-eye sketch of the immemorially familiar star-groups in Taurus, *made in full moonlight*, showed seventeen Hyades (two more than are given in Argelander’s “Uranometria Nova”) and ten Pleiades. Now ordinary eyes under ordinary circumstances see six, or at most seven, stars in the latter cluster. Hipparchus censured Aratus – who took his facts on trust from Eudoxus – for stating the lesser number, on the ground that, in serene weather, and in the absence of the moon, a seventh was discernible.²⁶ On the other hand, several of the ancients reckoned nine Pleiades, and we are assured that Moestlin, the worthy preceptor of Kepler, was able to detect, under the little propitious skies of Wurtemberg, no less than fourteen.²⁷ An instance of keensightedness but slightly inferior is afforded by a contemporary American observer: Mr. Henry Carvil Lewis, of Germantown, Pennsylvania, frequently perceives twelve of this interesting sidereal community.²⁸ The number of Pleiades counted is, then, without some acquaintance with the observer’s ordinary range of sight, a quite indeterminate criterion of atmospheric clearness; although we readily admit that Dr. Copeland’s detection of ten in the very front of a full moon gives an exalted idea of visual possibilities at La Paz.

During the season of *tempestades* – from the middle of December to the end of March – the weather in the Andes is simply abominable. Mr. Whymper describes everything as “bottled up in mist” after one brief bright hour in the early morning, and complains, writing from Quito, March 18th, 1880,²⁹ that his exertions had been left unrewarded by a single view from any one of the giant peaks scaled by him. Dr. Copeland adds a lamentable account – doubly lamentable to an astronomer in search of improved definition – of thunderstorms, torrential rains merging into snow or hail, overcast nocturnal skies, and “visible exhalations” from the drenched pampas. At Puno, however, towards the end of March, he succeeded in making some valuable observations, notwithstanding the detention – as contraband of war, apparently – of a large part of his apparatus. Puno is the terminal station on the Andes railway, and is situated at an altitude of 12,540 feet.

Here he not only discovered, with a 6-inch achromatic, mounted as need prescribed, several very close stellar pairs, of which Sir John Herschel’s 18 inch speculum had given him no intelligence; but in a few nights’ “sweeping” with a very small Vogel’s spectroscope, he just doubled the known number of a restricted, but particularly interesting, class of stars – if stars indeed they be. For while in the telescope they exhibit the ordinary stellar appearance of lucid points, they disclose, under the compulsion of prismatic analysis, the characteristic marks of a gaseous constitution; that is to say, the principal part of their light is concentrated in a few bright lines. The only valid distinction at present recognisable by us between stars and “nebulae” is thus, if not wholly abolished, at least rendered of a purely conventional character. We may agree to limit the term “nebulae” to bodies of a certain chemical constitution; but we cannot limit the doings of Nature, or insist on the maintenance of an arbitrary line of demarcation. From the keen rays of Vega to the undefined lustre of the curdling wisps of cosmical fog clinging round the sword-hilt of Orion, the distance is indeed enormous. But so it is from a horse to an oak tree; yet when we descend to volvoxes and diatoms, it is impossible to pronounce off-hand in which of the two great provinces of the kingdom of life we are treading. It would now seem that the celestial spaces have also their volvoxes and diatoms – “limiting instances,” as Bacon termed such – bodies that share the characters, and hang on the borders of two orders of creation.

²⁶ Hipp. ad Phaenomena, lib. i. cap. xiv.

²⁷ Cosmos, vol. iii. p. 272 note.

²⁸ Am. Jour. of Science, vol. xx. p. 437.

²⁹ Nature, vol. xxiii. p. 19.

In 1867, MM. Wolf and Rayet, of Paris, discovered that three yellow stars in the Swan, of about the eighth magnitude possessed the notable peculiarity of a bright-line spectrum. It was found by Raspighi and Le Sueur to be shared by one of the second order of brightness in Argo (γ Argûs), and Professor Pickering, of Harvard, reinforced the species, in 1880-81, with two further specimens. Dr. Copeland's necessarily discursive operations on the shores of Lake Titicaca raised the number of its members at once from six to eleven or twelve. Now the smaller "planetary" nebulae – so named by Sir William Herschel from the planet-like discs presented by the first-known and most conspicuous amongst them – are likewise only distinguished from minute stars by their spectra. Their light, when analysed with a prism, instead of running out into a parti-colored line, gathers itself into one or more bright dots. The position on the prismatic scale of those dots, alone serves to mark them off from the Wolf-Rayet family of stars. Hence the obvious inference that both nebulae and stars (of this type) are bodies similar in character, but dissimilar in constitution – that they agree in the general plan of their structure, but differ in the particular quality of the substances glowing in the vast, incandescent atmospheres which display their characteristic bright lines in our almost infinitely remote spectroscopes. Indeed, the fundamental identity of the two species are virtually demonstrated, by the "migrations" (to use a Baconian phrase) of the "new star" of 1876, which, as its original conflagration died out, passed through the stages, successively, of a Wolf-Rayet or *nebular star* (if we may be permitted to coin the term), and of a planetary nebula. So that not all the stars in space are suns – at least, not in the sense given to the word by our domestic experience in the solar system.

The investigation of these objects possesses extraordinary interest. As an index to the true nature of the relation undoubtedly subsisting between the lucid orbs and the "shining fluid" which equally form part of the sidereal system, their hybrid character renders them of peculiar value. Their distribution – so far restricted to the Milky Way and its borders – may perhaps afford a clue to the organisation of, and processes of change in that stupendous collection of worlds. At present, speculation would be premature; what we want are facts – facts regarding the distances of these anomalous objects – whether or not they fall within the range of the methods of measurement at present available; facts regarding their apparent motions; facts regarding the specific differences of the light emitted by them: its analogies with that of other bodies; its possible variations in amount or kind. The accumulation of any sufficient information on these points will demand with every external aid, the patient labor of years; under average conditions at the earth's surface, it can scarcely be considered as practically feasible. The facility of Dr. Copeland's discoveries sufficiently sets off the prerogatives, in this respect, of elevated stations; it is not too much to say that this purpose – were it solely in view – would fully justify the demand for their establishment.

Towards one other subject which we might easily be tempted to dwell upon, we will barely glance. Most of our readers have heard something of Dr. Huggins's new method of photographing the corona. Its importance consists in the prospect which it seems to offer for substituting for scanty and hurried researches during the brief moments of total eclipse, a leisurely and continuous study of that remarkable solar appendage. The method may be described as a *differential* one. It depends for its success on the superior intensity of coronal to ordinary sunlight in the extreme violet region. And since it happens that chloride of silver is sensitive to those rays *only* in which the corona is strongest, the coronal form disengages itself photographically, from the obliterating splendor which effectually shrouds it visually, by the superior vigor of its impression upon a chloride of silver film.

Now if this ingenious mode of procedure is to be rendered of any practical avail, advantage must, above all, be taken of the finer air of the mountains. This for two reasons. First, because the glare which, as it were, smothers the delicate structure we want to obtain records of, is there at a minimum; secondly, because the violet rays by which it impresses itself upon the "photographic retina"³⁰ are there at a maximum. These, as Professor Langley's experiments show, suffer far more

³⁰ An expression used by Mr. Warren de la Rue.

from atmospheric ravages than their less refrangible companions in the spectrum; the gain thus to them, relatively to the general gain, grows with every yard of ascent; the proportion, in other words, of short and quick vibrations in the light received becomes exalted as we press upwards – a fact brought into especial prominence by Dr. Copeland's solar observations at Vincocaya, 14,360 feet above the sea-level. Indeed, for all the operations of celestial photography, the advantages of great altitudes can hardly be exaggerated; and celestial photography is gradually assuming an importance which its first tentative efforts, thirty-four years ago, gave little reason to expect.

Thus, in three leading departments of modern astronomy – solar physics, stellar spectroscopy, and the wide field of photography – the aid of mountain observatories may be pronounced indispensable; while in all there is scarcely a doubt that it will prove eminently useful. There are, indeed, difficulties and drawbacks to their maintenance. The choice of a site, in the first place, is a matter requiring the most careful deliberation. Not all elevated points are available for the purpose. Some act persistently as vapor-condensers, and seldom doff their sullen cap of clouds. From any mountain in the United Kingdom, for instance, it would be folly to expect an astronomical benefit. On Ben Nevis, the chief amongst them, a meteorological observatory has recently been established with the best auguries of success; but it would indeed be a sanguine star-gazer who should expect improved telescopic opportunities from its misty summit.

Even in more favored climates, storms commonly prevail on the heights during several months of the year, and vehement winds give more or less annoyance at all seasons; the direct sunbeams sear the skin like a hot iron; the chill air congeals the blood. Dr. Copeland records that at Vincocaya, one afternoon in June, the black bulb thermometer exposed to solar radiation stood at 199°.1 of Fahrenheit – actually 13° above the boiling-point of water in that lofty spot – while the dry bulb was coated with ice! Still more formidable than these external discomforts is the effect on the human frame itself of transportation into a considerably rarer medium than that for existence in which it was constituted. The head aches; the pulse throbs; every inspiration is a gasp for breath; exertion becomes intolerable. Mr. Whymper's example seems to show that these extreme symptoms disappear with the resolute endurance of them, and that the system gradually becomes inured to its altered circumstances. But the probationary course is a severe one; and even though life flow back to its accustomed channels, labor must always be painfully impeded by a diminution of the vital supply. And the minor but very sensible inconveniences caused by the difficulty of cooking with water that boils twenty or thirty degrees (according to the height) below 212°, by the reluctance of fires to burn, and of tobacco to keep alight, and we complete a sufficiently deterrent list of the penalties attendant on literal compliance with the magnanimous motto, *Altiora petimus*.

That they will, nevertheless, not prove deterrent we may safely predict. Enthusiasm for science will assuredly overbear all difficulties that are not impossibilities. Dr. Copeland, taking all into account, ventures to recommend the occupation during the most favorable season – say from October to December – of an “extra-elevated station” 18,500 ft. above the sea, more than one promising site for which might be found in the vicinity of Lake Titicaca. For a permanent mountain observatory, however, he believes that 12,500 ft. would be the outside limit of practical usefulness. It is probable, indeed, that the Rocky Mountains will anticipate the Andes in lending the aid of their broad shoulders to lift astronomers towards the stars. Already a meteorological post has been established on Pike's Peak in Colorado, at an altitude of 14,151 ft. Telescopic vision there is said to be of rare excellence; we shall be surprised if its benefits be not ere long rendered available.

After all, the present strait of optical astronomy is but the inevitable consequence of its astonishing progress. While instruments remained feeble and imperfect, atmospheric troubles were comparatively little felt; they became intolerable when all other obstacles to a vast increase in the range of distinct vision were removed. The arrival of that stage in the history of the telescope, when the advantages to be derived from its further development should be completely neutralised by the more and more sensibly felt disadvantages of our situation on an air-encompassed globe, was only a

question of time. The point was a fixed one: it could be reached later only by a more sluggish advance. Both the difficulty and its remedy were foreseen 167 years ago by the greatest of astronomers and opticians.

“If the theory of making telescopes,” Sir Isaac Newton wrote in 1717,³¹ “could at length be fully brought into practice, yet there would be certain bounds beyond which telescopes could not perform. For the air through which we look upon the stars is in a perpetual tremor as may be seen by the tremulous motion of shadows cast from high towers, and by the twinkling of the fixed stars. The only remedy is a most serene and quiet air, such as may perhaps be found on the tops of the highest mountains above the grosser clouds.”

– *Edinburgh Review*.

³¹ Optice, p. 107 (2nd ed. 1719.) “Author’s Monitio” dated July 16, 1717.

GOETHE

BY PROF. J. R. SEELEY

III

The highest rank in literature belongs to those who combine the properly poetical with philosophical qualities, and crown both with a certain robust sincerity and common sense. The sovereign poet must be not merely a singer, but also a sage; to passion and music he must add large ideas; he must extend in width as well as in height; but, besides this, he must be no dreamer or fanatic, and must be rooted as firmly in the hard earth as he spreads widely and mounts freely towards the sky. Goethe, as we have described him, satisfies these conditions, and as much can be said of no other man of the modern world but Dante and Shakspeare.

Of this trio each is complete in all the three dimensions. Each feels deeply, each knows and sees clearly, and each has a stout grasp of reality. This completeness is what gives them their universal fame, and makes them interesting in all times and places. Each, however, is less complete in some directions than in others. Dante though no fanatic, yet is less rational than so great a man should have been. Shakspeare wants academic knowledge. Goethe, too, has his defects, but this is rather the place for dwelling on his peculiar merits. In respect of influence upon the world, he has for the present the advantage of being the latest, and therefore the least obsolete and exhausted, of the three. But he is also essentially much more of a teacher than his two predecessors. Alone among them he has a system, a theory of life, which he has thought and worked out for himself.

From Shakspeare, no doubt, the world may learn, and has learnt, much, yet he professed so little to be a teacher, that he has often been represented as almost without personality, as a mere undisturbed mirror, in which all Nature reflects itself. Something like a century passed before it was perceived that his works deserved to be in a serious sense studied. Dante was to his countrymen a great example and source of inspiration, but hardly, perhaps, a great teacher. On the other hand, Goethe was first to his own nation, and has since been to the whole world, what he describes his own Chiron, "the noble pedagogue,"³² a teacher and wise counsellor on all the most important subjects. To students in almost every department of literature and art, to unsettled spirits needing advice for the conduct of life, to the age itself in a great transition, he offers his word of weighty counsel, and is an acknowledged authority on a greater number of subjects than any other man. It is the great point of distinction between him and Shakspeare that he is so seriously didactic. Like Shakspeare myriad-minded, he has nothing of that ironic indifference, that irresponsibility, which has been often attributed to Shakspeare. He is, indeed, strangely indifferent on many points, which other teachers count important; but the lessons which he himself considers important, he teaches over and over again with all the seriousness of one who is a teacher by vocation. And, as I have said, when we look at his teaching as a whole, we find that it has unity, that, taken together, it makes a system, not, indeed in the academic sense, but in the sense that a great principle or view of life is the root from which all the special precepts proceed. This has, indeed, been questioned. Friedrich Schlegel made it a complaint against Goethe, that he had "no centre;" but a centre he has; only the variety of his subjects and styles is so great, and he abandons himself to each in turn so completely, that in his works, as in Nature itself, the unity is much less obvious than the multiplicity. Now that we have formed some estimate

³² "Der grosse Mann, der edle Pedagog, Der, sich zum Ruhm, ein Heldenvolk erzogen."

of the magnitude of his influence, and have also distinguished the stages by which his genius was developed, and his influence in Germany and the world diffused, it remains to examine his genius itself, the peculiar way of thinking, and the fundamental ideas through which he influenced the world.

Never, perhaps, was a more unfortunate formula invented than when, at a moment of reaction against his ascendancy, it occurred to some one to assert that Goethe had talent but not genius. No doubt the talent is there; perhaps no work in literature exhibits a mastery of so many literary styles as "Faust." From the sublime lyric of the prologue, which astonished Shelley, we pass through scenes in which the problems of human character are dealt with, scenes in which the supernatural is brought surprisingly near to real life, scenes of humble life startlingly vivid, grotesque scenes of devilry, scenes of overwhelming pathos; then, in the second part, we find an incomparable revival of the Greek drama, and, at the close, a Dantesque vision of the Christian heaven. Such versatility in a single work is unrivalled; and the versatility of which Goethe's writings, as a whole, gives evidence is much greater still. But to represent him, on this account, as a sort of mocking-bird, or ready imitator, is not merely unjust. Even if we give this representation a flattering turn, and describe him as a being almost superior to humanity, capable of entering fully into all that men think and feel, but holding himself independent of it all, such a being as is described (where, I suppose, Goethe is pointed at) in the Palace of Art, again, I say, it is not merely unjust. Not merely Goethe was not such a being, but we may express it more strongly and say: such a being is precisely what Goethe was not. He had, no doubt, a great power of entering into foreign literatures; he was, no doubt, indifferent to many controversies which in England, when we began to lead him, still raged hotly. But these were characteristic qualities, not of Goethe personally, but of Germany in the age of Goethe. A sort of cosmopolitan characterlessness marked the nation, so that Lessing could say in Goethe's youth that the character of the Germans was to have no character. Goethe could not but share in the infirmity, but his peculiarity was that from the beginning he felt it as an infirmity, and struggled to overcome it. That unbounded intolerance, that readiness to allow everything and appreciate every one, which was so marked in the Germans of that time that it is clearly perceptible in their political history, and contributed to their humiliation by Napoleon, is just what is satirized in the delineation of Wilhelm Meister. Jarno says to Wilhelm, "I am glad to see you out of temper; it would be better still if you could be for once thoroughly angry." This sentiment was often in Goethe's mouth; so far was he from priding himself upon serene universal impartiality. Crabbe Robinson heard him say what an annoyance he felt it to appreciate everything equally and to be able to hate nothing. He flattered himself at that time that he had a real aversion. "I hate," he said, "everything Oriental" ("Eigentlich hasse ich alles Orientalische"). He goes further in the "West-östlicher Divan," where, in enumerating the qualities a poet ought to have, he lays it down as indispensable that he should hate many things ("Dann zuletzt ist unerlässlich dass der Dichter *manches hasse*"). True, no doubt that he found it difficult to hate. An infinite good nature was born in him, and, besides this, he grew up in a society in which all established opinions had been shaken, so that for a rational man it was really difficult to determine what deserved hatred or love. What is wholly untrue in that view of him, which was so fashionable forty years ago – "I sit apart holding no form of creed, but contemplating all" – is that this tolerance was the intentional result of cold pride or self-sufficiency. He does not seem to me to have been either proud or unsympathetic, and among the many things of which he might boast, certainly he would not have included a want of definite opinions – he, who was never tired of rebuking the Germans for their vagueness, and who admired young Englishmen expressly because they seemed to know their own minds, even when they had little mind to know. Distinctness, character, is what he admires, what through life he struggles for, what he and Schiller alike chide the Germans for wanting. But he cannot attain it by a short cut. Narrowness is impossible to him, not only because his mind is large, but because the German public in their good-natured tolerance have made themselves familiar with such vast variety of ideas. He cannot be a John Bull, however much he may admire John Bull, because he does not live in an island. To have distinct views he must make a resolute act

of choice, since all ideas have been laid before him, all are familiar to the society in which he lives. This perplexity, this difficulty of choosing what was good out of such a heap of opinions, he often expresses: "The people to be sure are not accustomed to what is best, but then they are so terribly well-read!"³³ But it is just the struggle he makes for distinctness that is admirable in him. The breadth, the tolerance, he has in common with his German contemporaries; what he has to himself is the resolute determination to arrive at clearness.

Nevertheless, he may seem indifferent even to those whose minds are less contracted than was the English mind half a century ago, for this reason, that his aim, though not less serious than that of others, is not quite the same. He seldom takes a side in the controversies of the time. You do not find him weighing the claims of Protestantism and Catholicism, nor following with eager interest the dispute between orthodoxy and rationalism. Again when all intellectual Germany is divided between the new philosophy of Kant and the old system, and later, when varieties show themselves in the new philosophy, when Fichte and Schelling succeed to the vogue of Kant, Goethe remains undisturbed by all these changes of opinion. He is almost as little affected by political controversy. The French Revolution irritates him, but not so much because it is opposed to his convictions as because it creates disturbance. Even the War of Liberation cannot rouse him. Was he not then a quietest? Did he not hold himself aloof, whether in a proud feeling of superiority or in mere Epicurean indifference, from all the interests and passions of humanity? If this were the case, or nearly the case, Goethe would have no claim to rank in the first class of literature. He might pass for a prodigy of literary expertness and versatility, but he would attract no lasting interest. Such quietism in a man upon whom the eyes of a whole nation were bent, could never be compared to the quietism of Shakspeare, who belonged to the uninfluential classes, and to whom no one looked for guidance.

But in truth the quietism of Goethe was the effect not of indifference or of selfishness, but of preoccupation. He had prescribed to himself in early life a task, and he declined to be drawn aside from it by the controversies of the time. It was a task worthy of the powers of the greatest man; it appeared to him, when he devoted himself to it, more useful and necessary than the special undertakings of theologian or philosopher. At the outset he might fairly claim to be the only earnest man in Germany, and might regard the partisans alike of Church and University as triflers in comparison with himself. The French Revolution changed the appearance of things. He could not deny that the political questions opened by that convulsion were of the greatest importance. But he was now forty years old, and the work of his life had begun so early, had been planned with so much care and prosecuted with so much method, that he was less able than many men might have been to make a new beginning at forty. Hence he was merely disturbed by the change which inspired so many others, and to the end of his life continued to look back upon the twenty odd years between the Seven Years' War and the Revolution as a golden time, as in a peculiar sense his own time.³⁴ The new events disturbed him in his habits without actually forcing him to form new habits; he found himself able, though with less comfort, to lead the same sort of life as before; and so he passed into the Napoleonic period and arrived in time at the year of liberation, 1813. Then, indeed, his quietism became shocking, and he felt it so himself; but it was now really too late to abandon a road on which he had travelled so long, and which he had honestly selected as the best.

What, then, was this task to which Goethe had so early devoted himself, and which seemed to him too important to be postponed even to the exigencies of the Revolutionary and Napoleonic periods? It was that task about which, since Goethe's time, so much has been said – self-culture. "From my boyhood," says Wilhelm, speaking evidently for Goethe himself, "it has been my wish and purpose to develop completely all that is in me." Elsewhere he says, "to make my own existence harmonious." Here is the refined form of selfishness of which Goethe has been so often accused.

³³ "Zwar sind sie an das Beste nicht gewöhnt, Allein sie haben schrecklich viel gelesen."

³⁴ "Zwanzig Jahre liess sich gehnUnd genoss was mir beschieden;Eine Reihe völlig schönWie die Zeit der Barmeciden." – *West. Div.*

And undoubtedly the phrase is one which will bear a selfish interpretation, just as a Christian may be selfish when he devotes himself to the salvation of his soul. But in the one case, as in the other, it is before all things evident that the task undertaken is very serious, and that the man who undertakes it must be of a very serious disposition. When, as in Goethe's case it is self-planned and self-imposed, such an undertaking is comparable to those great practical experiments in the conduct of life which were made by the early Greek philosophers. Right or wrong, such an experiment can only be imagined by an original man, and can only be carried into effect by a man of very steadfast will. But we may add that it is no more necessary to give a selfish interpretation to this formula than to the other formulæ by which philosophers have tried to describe the object of a moral life. A harmonious existence does not necessarily mean an existence passed in selfish enjoyment. Nor is the pursuit of it necessarily selfish, since the best way to procure a harmonious existence for others is to find out by an experiment practised on oneself in what a harmonious existence consists, and by what methods it may be attained. For the present, at least, let us content ourselves with remarking that Goethe, who knew his own mind as well as most people, considered himself to carry disinterestedness almost to an extreme. What especially struck him in Spinoza, he says, was the boundless unselfishness that shone out of such sentences as this, "He who loves God must not require that God should love him again." "For," he continues, "to be unselfish in everything, especially in love and friendship, was my highest pleasure, my maxim, my discipline, so that that petulant sentence written latter, 'If I love you, what does that matter to you?' came from my very heart."

However this may be, when a man, so richly gifted otherwise, displays the rarest of all manly qualities – viz., the power and persistent will to make his life systematic, and place all his action under the control of a principle freely and freshly conceived, he rises at once into the highest class of men. It is the strenuous energy with which Goethe enters into the battle of life, and fights there for a victory into which others may enter, that makes him great, that makes him the teacher of these later ages, and not some foppish pretension of being above it all, of seeing through it and despising it. But just because he conceived the problem in his own manner, and not precisely as it is conceived by the recognized authorities on the conduct of life, he could take little interest in the controversies which those authorities held among themselves, and therefore passed for indifferent to the problem itself. He did not admit that the question was to form an opinion as to the conditions of the life after death, though he himself hoped for such a future life, for he wanted rather rightly to understand and to deal with the present life; nor did he want what is called in the schools a philosophy, remarking probably that the most approved professors of philosophy lived after all much in the same way as other people. It seemed to him that he was more earnest than either the theologians or the philosophers, just because he disregarded their disputes and grappled directly with the question which they under various pretexts evaded – how to make existence satisfactory.

He grasps it in the rough unceremonious manner of one who means business, and also in the manner which Rousseau had made fashionable. We have desires given us by God or Nature, convertible terms to him; these desires are meant to receive satisfaction, for the world is not a stupid place, and the Maker of the world is not stupid. This notion that human life is not a stupid affair, and that the fault must be ours if it seems so, that for everything wrong there must be a remedy,³⁵ is a sort of fundamental axiom with him, as it is with most moral reformers. Even when he has death before his mind he still protests. "He is no more! Ridiculous! Why 'no more?' 'It is all over.' What can be the meaning of that? Then it might as well never have existed. Give me rather an eternal void." And this way of thinking brings him at once, or so he thinks, into direct conflict with the reigning system of morality, which is founded not on the satisfaction, but on the mortification of desire. He declares war against the doctrine of self-denial or abstinence. "Abstain, abstain! – that is the eternal song that rings in every ear. In the morning I awake in horror, and am tempted to shed bitter tears at

³⁵ "Sicherlich es muss das Beste Irgendwo zu finden sein."

the sight of day, which in its course will not gratify one wish, not one single wish.” So speaks Faust, and Goethe ratifies it in his own person, when he complains that, “we are not allowed to develop what we have in us, and are denied what is necessary to supply our deficiencies; robbed of what we have won by labor or has been allowed us by kindness, and find ourselves compelled, before we can form a clear opinion about it to give up our personality, at first in instalments, but at last completely; also that we are expected to make a more delighted face over the cup the more bitter it tastes, lest the unconcerned spectator should be affronted by any thing like a grimace.” He adds that this system is grounded on the maxim that “All is vanity,” a maxim which characteristically he pronounces false and blasphemous. That “all is *not* vanity” is indeed almost the substance of Goethe’s philosophy. “His faith,” so he tells the Houri who, at the gate of Paradise, requires him to prove his orthodoxy, “has always been that the world, whichever way it rolls, is a thing to love, a thing to be thankful for.”³⁶

This doctrine again, is not in itself or necessarily a doctrine of selfishness, though it may easily be represented so. It may be true that all virtue requires self-denial; but for that very reason we may easily conceive a system of senseless and aimless self-denial setting itself up in the place of virtue. It is not every kind of self-denial that Goethe has in view, but the particular kind by which he has found himself hampered. His indignation is not moved when he sees abstinence practised in order to attain some great end; it is the abstinence which leads to nothing and aims at nothing that provokes him. He has given two striking dramatic pictures of it. There is Faust, who cannot tolerate the emptiness of his secluded life; but does it appear that he rebels against it simply because it brings no pleasure to himself, even though it confers benefit upon others and upon the world? The burden of his complaint is that his abstinence does no good to anybody, that the studies for which he foregoes pleasure lead to no real knowledge; and expressly to make this clear, Goethe introduces the story of the plague, which Faust and his father had tried to cure by a drug, which did infinitely more harm than the plague itself. The other picture is that of Brother Martin in “Götz,” the young monk who envies Götz his life so full of movement and emotion, while he is himself miserable under the restraint of his vows. Here, again, the complaint is that no good comes of such abstinence. The life of self-denial is conceived as an utter stagnation, unhealthy even from a moral point of view. It is contrasted with a life not of luxury, but of strenuous energy, at once wholesome and useful to the world.

So far, then, Goethe’s position is identical with that which Protestants take up against monasticism, when they maintain that powers were given to be used, desires implanted in order that they might be satisfied. He does not, any more than they, assert that when some great end is in view it may not be nobler to mortify the desire than to indulge it. But he applies the principle more consistently, and to a greater number of cases than they had applied it. Not against celibacy or useless self-torture only, but against all omission to satisfy desire, against all sluggishness or apathy in enjoyment – understood always that no special end is to be gained by the self-denial – he protests. In his poem, called the “General Confession” (“Generalbeichte”) he calls his followers to repent of the sin of having often let slip an opportunity of enjoyment, and makes them solemnly resolve not to be guilty of such sins in future. Here, at least, the reader may say, selfishness is openly preached; and perhaps this is the interpretation most commonly put upon the poem. Yet it is certainly unjust to pervert in this way an intentional paradox, and, in fact, in that very poem Goethe introduces the most elevated utterance of his philosophy; for the vow which the penitents are required to take is that they will “wean themselves from half-measures and live resolutely in the Whole, in the *Good*, and the *Beautiful*!” Goethe, in short, holds, as many other philosophers have done, that an elevated morality may be based on the idea of pleasure not less than on the idea of duty.

This principle, not new in itself, led to very new and important results when it was taken up not by a mere reasoner but by a man of the most various gifts and of the greatest energy. By “pleasure” or “satisfaction of desire” is usually meant something obvious, something passive, merely

³⁶ “Dass die Welt, wie sie auch kreise, Liebevoll und dankbar sei.”

a supply of agreeable sensations to each of the five senses. In Goethe's mouth the word takes quite a different meaning. He cannot conceive pleasure without energetic action, and the most necessary of all pleasures to him is that of imaginative creation. The desires, again, for which he claims satisfaction – what are they? Chief among them is the desire to enter into the secret of the universe, to recognize “what it is which holds the world together within.” Such desires as these might be satisfied, such pleasures enjoyed, without any very culpable self-indulgence. And existence would be satisfactory, or, as he calls it, harmonious, if it offered continually and habitually food for desire so understood, which is almost the same thing as capacity. But there are hindrances. The chief of these is the supposition of self denial. Of course every practical man knows that self-denial of a certain kind must be constantly practised in life. The small object must be foregone for the sake of the greater, the immediate pleasure for the sake of the remote, nay, the personal pleasure for the sake of the pleasure which is generous and sympathetic. But the timid superstition which sets up self-denial, divorced from all rational ends, as a thing good and right in itself, which makes us afraid of enjoyment as such, this is the chief hindrance, and against this Goethe launches his chief work “Faust.” There is another hindrance, less obvious and needing to be dealt with in another way, which Goethe therefore attacks usually in prose rather than in poetry.

Man, as Goethe conceives him, is essentially active. The happiness he seeks is not passive enjoyment, but an occupation, a pursuit adapted to his inborn capacities. It follows that a principal condition of happiness is a just self-knowledge. He will be happy, who knows what he wants and what he can do. Here again Goethe gives importance to a doctrine which in itself is obvious enough by the persistent energy with which he applies it. He has been himself bewildered by the multiplicity of his own tastes and aptitudes. He has wanted to do everything in turn, and he has found himself capable to a certain extent of doing everything. Hence the question – What is my true vocation? has been to him exceptionally difficult. In studying it he has become aware of the numberless illusions and misconceptions which hide from most men the true nature of their own aptitudes, and therefore the path of their happiness. He finds that the circumstances of childhood, and especially our system of education, which “excites wishes, instead of awakening tastes,” have the effect of creating a multitude of unreal ambitions, deceptive impulses and semblances of aptitudes. He finds that most men have been more or less misled by these illusions, have more or less mistaken their true vocation, and therefore missed their true happiness. On this subject he has collected a vast mass of observations, and, in fact, added a new chapter to practical morality. This is the subject of “Wilhelm Meister,” not the most attractive nor the most perfect, but perhaps the most characteristic, of Goethe's works and, as it were, the text-book of the Goethian philosophy. It is said not to be widely popular in Germany. Most English readers lay it down bewildered, wondering what Goethe's admirers can see in it so extraordinary, and astonished at the indifference to what we have agreed to call morality – that is, the part of morality that concerns the relations of the sexes – which reigns throughout it. I shall touch on this latter point later. Meanwhile, let me remark, that few books have had a deeper influence upon modern literature than this famous novel. It is the first important instance of a novel which deals principally and on a large scale with opinions or views of life. How Wilhelm mistook his vocation, and how this mistake led to many others; how a secret society, the Society of the Tower, taught a doctrine on the subject of vocations, and of the method by which men are to be assisted in discovering their true vocations; how Wilhelm is assisted and by what stages he arrives at clearness – this is the subject of a long and elaborate narrative. It is throughout most seriously instructive; it is seldom very amusing; and we may add that the moral of the story is not brought out with very convincing distinctness. But it has been the model upon which the novel of the present day is formed. Written twenty years before the Waverley Novels, which are in the opposite extreme, since they make no serious attempt to teach anything and dwell upon everything which Goethe disregards, adventure, surprise, costume, it began to produce its effect among us when the influence of the Waverley Novel was exhausted. The idea now prevalent, which gives to the novel a practical as well as an artistic side, the idea which prompts

us, when we wish to preach any kind of social or moral reform, to write a novel about it, seems to have made way chiefly through Goethe's authority.

But the substance of "Wilhelm Meister" is even more important than the form. It presents the whole subject of morality under a new light, and as in this respect it is only the fullest of a number of utterances to the same effect made by Goethe, it can never be fully appreciated when it is considered by itself, but must be judged in the closest connection with his other works and with his life. Every attempt to treat such a subject as morality in an original manner has something alarming about it. Such attempts ought to be laid only before minds strong enough to consider them calmly, and yet of necessity they come to the knowledge of "the weak brethren," who are frightened or unsettled by them. Moreover, such attempts are always likely to be one-sided. As it is usually an intense perception of something overlooked into the orthodox morality that prompts them, the innovator is apt to be hurried into the opposite extreme, and to overlook in his turn what the orthodox morality has taught rightly. Goethe laid himself open to the charge of immorality. "Wilhelm Meister" was received with horror by the religious world; it was, if I remember right, publicly burnt by Count Stolberg. In England, Wordsworth spoke of it with disgust, and it still remains the book which chiefly justifies the profound distrust and aversion with which Goethe has been and is regarded among those who are Christian either in the dogmatic or in the larger sense. Not unnaturally it must be confessed.

But I do seriously submit that Christians should learn to be less timid than they are. In their absorbing anxiety for "the weaker brethren" they often seem to run the risk of becoming "weak brethren" themselves. We ought not to come to the consideration of moral questions under the influence of panic and nervous fright. It is true that few books seem at first sight more directly opposed than "Wilhelm Meister" to that practical Christianity which we love to think of as beyond controversy, that spirit which, as it breathes from almost all Christian churches and sects alike, strikes us as undoubtedly the essential part of religion. At first sight the book seems secular, heathenish in an extraordinary degree. Let us, then, if we will, warn young people away from it; but let us ask ourselves at the same time how a man so gifted, so serious and also so good natured – for there is no appearance of rancor in the book, which even contains a picture, tenderly and pleasingly drawn, of Christian pietism – could come to take a view so different from that commonly accepted of questions about which we are all so anxious. Such a course may lead us to see mistakes made by modern Christianity, which may have led Goethe also into mistakes by reaction; whereas the other course, of simply averting our eyes in horror, can lead to no good.

We may distinguish between the positive and the negative part of this moral scheme. All that "Wilhelm Meister" contains on the subject of vocations seems valuable, and the prominence which he gives to the subject is immensely important. In considering how human life should be ordered, Goethe begins with the fact that each man has an occupation, which fills most of his time. It seems to him, therefore, the principal problem to secure that this occupation should be not only worthy, but suited to the capacity of the individual and pursued in a serious spirit. What can be more simple and obvious? And yet, if we reflect, we shall see that moralists have not usually taken this simple view, and that in the accepted morality this whole class of questions is little considered. Duties to this person and to that, to men, to women, to dependents, to the poor, to the State – these are considered; but the greatest of all duties, that of choosing one's occupation rightly, is overlooked. And yet it is the greatest of duties, because on it depend the usefulness and effectiveness of the man's life considered as a whole, and, at the same time, his own peace of mind, or, as Goethe calls it, his inward harmony. Nevertheless, it is so much overlooked that in ordinary views of life all moral interest is, as it were, concentrated upon the hours of leisure. The occupation is treated as a matter of course, a necessary routine about which little can be said. True life is regarded as beginning when work is over. In work men may no doubt be honest or dishonest, energetic or slothful, persevering or desultory, successful or unsuccessful, but that is all; it is only in leisure that they can be interesting, highly moral, amiable,

poetical. Such a view of life is, to say the least, unfortunate. It surrenders to deadness and dulness more than half of our existence.

In primitive times, when the main business of life was war, this was otherwise. Then men gave their hearts to the pursuit to which they gave their time. What was most important was also most interesting, and the poet when he sang of war sang of business too. Hence came the inimitable fire and life of Homeric and Shakspearian poetry. But when war gave place to industry, it seemed that this grand unity of human life is gone. Business, the important half of life, became unpoetical, from the higher point of view uninteresting – for how could the imagination dwell on the labors of the office or the factory? – and all higher interest was confined to that part of life in which energy is relaxed. Goethe's peculiar realism at once prompts and enables him to introduce a reform here. He denies that business is uninteresting, and maintains that the fault is in our own narrowness and in our slavery to a poetical tradition. It is the distinction of "Wilhelm Meister" that it is actually a novel about business, not merely a realistic novel venturing to approach the edge of that slough of dulness which is supposed to be at the centre of all our lives, but actually a novel about business as such, an attempt to show that the occupation to which a man gives his life is a matter not only for serious thought, but that it is a matter also for philosophy and poetry. That such a novel must at first sight appear tame and dull is obvious; it undertakes to create the taste by which it can be enjoyed, and will be condemned at once by all who are not disposed to give it a serious trial. But the question it raises is the fundamental question of modern life. Comprehensive and practical at once, Goethe's mind has found out that root of bitterness which is at the bottom of all the uneasy social agitations of the nineteenth century. We live in the industrial ages, and he has asked the question whether industry must of necessity be a form of slavery, or whether it can be glorified and made into a source of moral health and happiness.

It is commonly said that "Wilhelm Meister," seems to make Art the one object of life; but this is not Goethe's intention. He was himself an artist, and, as the work is in a great degree autobiographical, art naturally comes into the foreground, and the book becomes especially interesting to artists, but the real subject of it is vocations in general. In the later books, indeed, art drops into the background, and we have a view of feminine vocations. The "Beautiful Soul" represents the pietistic view of life; then Therese appears in contrast, representing the economic or utilitarian view; finally, Natalie hits the golden mean, being practical like Therese but less utilitarian, and, ideal like her aunt, the pietist, but less introspective. On the whole, then, the lesson of the book is that we should give unity to our lives by devoting them with hearty enthusiasm to some pursuit, and that the pursuit is assigned to us by Nature through the capacities she has given us. It is thus that Goethe substitutes for the idea of pleasure that of the satisfaction of special inborn aptitudes different in each individual. His system treats every man as a genius, for it regards every man as having his own unique individuality, for which it claims the same sort of tender consideration that is conceded to genius. But in laying down such rules Goethe thinks first of himself. He has spent long years in trying to make out his own vocation. He has had an opportunity of living almost every kind of life in turn. It was not till he returned from Italy that he felt himself to have arrived at clearness. What was Goethe's vocation? Or, since happiness consists in faithful obedience to a natural vocation, what was Goethe's happiness? His happiness is a kind of religion, a perpetual rapt contemplation, a beatific vision. The object of this contemplation is Nature, the laws or order of the Universe to which we belong. Of such contemplation he recognizes two kinds, one of which he calls Art and the other Science. He was in the habit of thinking that in Art and Science taken together he possessed an equivalent for what other men call their religion. Thus, in 1817, on the occasion of the tercentenary of the Reformation, he writes a poem in which he expresses his devout resolution of showing his Protestantism, as ever, by Art and Science.³⁷ It was because his view of Art was so realistic, that he was able thus to regard Art as a sort of twin-sister of Science. But the principle involved in this twofold contemplation of Nature is the very principle of religion

³⁷ "Will ich in Kunst und Wissenschaft, Wie immer, protestiren."

itself, and in one sense it is true that no man was ever more deliberately and consciously religious than Goethe. No man asserted more emphatically that the energy of action ought to be accompanied by the energy of feeling. It is the consistent principle of his life that the whole man ought to act together, and he pushes it so far that he seems to forbid all division of labor in science. This is the position taken up in “Faust” which perhaps is seldom rightly understood. Science, according to “Faust,” must not be dry analysis pursued at a desk in a close room; it must be direct wondering contemplation of Nature. The secrets of the world must disclose themselves to a loving gaze, not to dry thinking (*trocknes Sinn*), man must converse with Nature “as one spirit with another,” “look into her breast as into the bosom of a friend.” How we should *not* study is conveyed to us by the picture of Wagner, who is treated with so much contempt. He is simply the ordinary man of science, perhaps we may think the modest practical investigator, of the class to which the advance of science is mainly due. But Goethe has no mercy on him – why? Because his nature is divided, because his feelings do not keep pace with his thoughts, because his attention is concentrated upon single points. Such a man is to Goethe “the dry creeper,” “the most pitiable of all the sons of earth.”

Thus it is, then, that Art and Science taken together, the living, loving, worshipping contemplation of Nature, out of which comes the knowledge of Nature, are to Goethe religion. But is not such a religion wholly different from religion as commonly understood, wholly different from Christianity?

It was, indeed, very different from such Christianity as he found professed around him. In his youth Goethe was acquainted with several eminently religious persons, Fräulein von Klettenberg, the Frankfurt friend of his family, Jung Stilling, and Lavater. He listened to these not only with his unfailing good humor, but at times with more conviction than “Dichtung und Wahrheit” would lead us to suppose. In some of his early letters he himself adopts pietistic language. But as his own peculiar ideas developed themselves, they separated him more and more from the religious world of his time. At the time of his Italian journey and for some years afterwards, we find him speaking of Christianity not merely with indifference, but with a good deal of bitterness. This hostility took rather a peculiar form. As the whole disposition of his mind leads him towards religion, as he can no more help being religious than he can help being a poet, he does not reject religion but changes his religion. He becomes, or tries to become, a heathen in the positive sense of the word; for the description of Goethe as the Great Heathen is not a mere epithet thrown at him by his adversaries. He provoked and almost claimed it in his sketch of Winckelmann, where, after enthusiastic praise of the ancients and of Winckelmann as an interpreter of the ancient world, he inserted a chapter entitled, “Heidnisches,” which begins thus: “This picture of the antique spirit, absorbed in this world and its good things, leads us directly to the reflection that such excellences are only compatible with a heathenish way of thinking. The self-confidence, the attention to the present, the pure worship of the gods as ancestors, the admiration of them, as it were, only as works of art, the submission to an irresistible fate, the future hope also confined to this world, since it rests on the preciousness of posthumous fame; all this belongs so necessarily together, makes such an indivisible whole, creates a condition of human life intended by Nature herself, that we become conscious, alike at the height of enjoyment, and in the depth of sacrifice and even of ruin, of an indestructible health.” Clearly when he wrote this (about 1804) Goethe wished and intended to pass for a heathen. And, indeed, the antique attracts him scarcely at all from the historical side – he is no republican, no lover of liberty – but almost exclusively because it offers a religion which is to him the religion of health and joy.

Is it, then, true that Christianity is a system of morbid and melancholy introspectiveness, sacrificing all the freshness and glory of the present life to an awful future? He makes this assumption, and had almost a right to make it, since the Christianity of his time had almost exclusively this character. He was, however, himself half aware that there was all the difference in the world between the Christianity of his time and original Christianity or Christianity as it might be. And even at the time of his greatest bitterness he drops expressions which show that he does not altogether relinquish

his interest in Christianity, but keeps open for himself the alternative of appearing as a reformer rather than an assailant of it. In the third period and the old age his tone is a good deal more conciliating than in the passage above quoted. In the Autobiography he appears, on the whole, as a Christian, and even makes faint attempts here and there to write in a style that Christians may find edifying. He tells us expressly that he had little sympathy with the Encyclopædists, and, in a passage of the “West-östlicher Divan,” he declares with real warmth that he “has taken into his heart the glorious image of our sacred books, and, as the Lord’s image was impressed on St. Veronica’s cloth, he refreshes himself in the stillness of the breast in spite of all negation and hindrance with the inspiring vision of faith.” Again, when in the “Wanderjahre” he grapples constructively, but somewhat too late, with the problems of the nineteenth century, we find him assuming a reformed Christianity³⁸ as the religion of the future.

May we then regard Goethe as one who in reality only opposed the corruptions of Christianity even when he seemed to oppose Christianity itself? Certainly *other worldliness* does not now appear, at least in England, as a necessary part of Christianity. Surely that contrast between the healthy spirit of antiquity and the morbidness of Christianity, which was like a fixed idea in the mind of Goethe’s generation, need not trouble us now. Those sweeping generalizations belonged to the infancy of the historical sciences. Mediævalism does not now seem identical with Christianity. The sombre aspect of our religion is clearing away. Christian self-denial now appears not as the aimless, fruitless mortification of desire which Goethe detested, but as the heroic strenuousness which he practiced. The world which Christians renounce now appears to be, not the universe nor the present life, but only conventionalism and tyrannous fashion. With such a religion, Goethe’s philosophy is sufficiently in harmony. According to these definitions the spirit even of “Wilhelm Meister” is not secular. Even his avowal of heathenism comes to wear a different aspect, when we find him writing thus of the religion of the old Testament: “Among all heathen religions, for to this class belongs that of Israel as much as any, this one has great points of superiority,” &c. (he mentions particularly its “excellent collection of sacred books”). So that, after all, Goethe may only have been a heathen as the prophet Isaiah was a heathen!

Thus hindrance after hindrance to our regarding Goethe as a great prophet of the higher life and of the true religion disappears. There remains one which is not so easily removed. What surprises the English reader in “Wilhelm Meister” is not merely the prominence given to Art, or the serious devotion to things present and to the present life, but also the extraordinary levity with which it treats the relations of men and women. The book might, in fact, be called thoroughly immoral, if the use of that word which is common among us were justifiable. More correctly speaking, it is immoral throughout on one point; immoral, in Goethe’s peculiar, inimitable, good-natured manner. The levity is the more startling in a book otherwise so remarkably grave. Every subject but one is discussed with seriousness; in parts the solemnity of the writer’s wisdom becomes quite oppressive; but on the relations of men and women he speaks in a thoroughly worldly tone. Just where most moralists grow serious, he becomes wholly libertine, indifferent, and secular. There is nothing in this novel of the homely domestic morality of the Teutonic races; a French tone pervades it, and this tone is more or less perceptible in the other writings of Goethe, especially those of the second period, with the exception of “Hermann und Dorothea.” On this subject, the great and wise thinker descends to a lower level; he seems incapable of regarding it with seriousness; or if he does treat it seriously, as in the Elective Affinities, he startles us still more by a certain crude audacity.

It seems possible to trace how Goethe fell into this extraordinary moral heresy. Starting from the idea of the satisfaction of desire, and with a strong prejudice against all systems of self-denial, he perceived, further, that chastity is the favorite virtue of mediævalism, that it is peculiarly Catholic and monastic. Then, as his mind turned more and more to the antique, he found himself in a world of primitive morals, where the woman is half a slave. He found that in the ancient world friendship

³⁸ “An diese Religion halten wir fest, aber auf eine eigene Weise.”

is more and love less than in the modern – to this point, too, Winckelmann had called his attention – and, since he had adopted it as a principle that the ancients were healthy-minded and that the moderns are morbid, he jumped to the conclusion that the sentimental view of love is but a modern illusion. He accustomed his imagination to the lower kind of love which we meet with in classical poetry, the love of Achilles for Briseis, of Ajax for Tecmessa. In his early pamphlet against Wieland (“Götter, Helden und Wieland,” 1773), we find him already upon this train of reasoning, and his conclusions are announced with the most unceremonious plainness. How seriously they were adopted may be seen from the “Roman Elegies,” written fifteen years later. Among the many reactions which the eighteenth century witnessed against the spirit of Christianity, scarcely any is so startling and remarkable as that which comes to light in these poems. Here the woman has sunk again to her ancient level, and we find ourselves once more among the Hetaeræ of old Greek cities. After reading these wonderful poems, if we go through the list of Goethe’s female characters we shall note how many among them belong to the class of Hetaeræ – Clärchen, Marianne, Philine, Gretchen, the Bayadere. And if we turn to his life, we find the man, who shrank more than once from a worthy marriage, taking a Tecmessa to his tent. The woman who became at last his wife was spoken of by him in a letter to the Frau von Stein, as “that poor creature.” She is the very beauty celebrated in the “Roman Elegies.”

This strange moral theory could not but have strange consequences. Love, as Goethe knows it, is very tender, and has a lyric note as fresh as that of a song-bird; but it passes away like the songs of spring. In his Autobiography, one love-passage succeeds another, each is charmingly described, but each comes speedily to an end. How far in each case he was to blame is matter of controversy. But he seems to betray a way of thinking about women such as might be natural to an Oriental Sultan. “I was in that agreeable phase,” he writes, “when a new passion had begun to spring up in me before the old one had quite disappeared.” About Friederika he blames himself without reserve, and uses strong expressions of contrition; but he forgets the matter strangely soon. In his distress of mind he says he found riding, and especially skating, bring much relief. This reminds us of the famous letter to the Frau von Stein about coffee. He is always ready in a moment to shake off the deepest impressions and to receive new ones; and he never looks back. A curious insensibility, which seems imitated from the apparent insensibility of Nature herself, shows itself in his works by the side of the deepest pathos. Faust never once mentions Gretchen again, after that terrible prison scene; her remembrance does not seem to trouble him; she seems entirely forgotten, until, just at the end, among the penitents who surround the Mater Gloriosa, there appears one who has borne the name of Gretchen. In like manner – this shocked Schiller – when Mignon dies she seems instantly forgotten, and the business of the novel scarcely pauses for a moment.

We are also to remember that Goethe was a man of the old *régime*. If he who had such an instinctive comprehension of feminine character, at the same time treats women in this Oriental fashion, we are to remember that he lived in a country of despotic Courts, and also that he was entirely outside the movement of reform. Had he entered into the reforming movement of his age, he might have striven to elevate women, as he might have heralded and welcomed some of the ideas of 1789, and the nationality movements of 1808 and 1813. He certainly felt at times that all was not right in the status of women (“Der Frauen Schicksal ist beklagenswerth”), and how narrowly confined was their happiness (“Wie enggebunden ist des Weibes Glück,”), as he certainly felt how miserable was the political conditions of Germany. Nevertheless he did not take the path either of social or of political reform. He worked in another region, a deeper region. He was a reformer on the great scale in literature, art, education, that is, in culture, but he was not a reformer of institutions. And as he did not look forward to a change in institutions, his views and his very morality rested on the assumption of a state of society in many respects miserably bad.

But the effect of this aberration upon Goethe’s character as a teacher and upon his influence has been most disastrous. And inevitably, for as it has been the practice in the Christian world to lay all the stress of morality upon that very virtue which Goethe almost entirely repudiates, he appears not

only to be no moralist but an enemy of morality. And as he once brought a devil upon the stage, we identify him with his own Mephistopheles, though, in fact, the tone of cold irony is not by any means congenial to him. He has the reputation of a being awfully wise, who has experienced all feelings good and bad, but has survived them, and from whose writings there rises a cold unwholesome exhalation, the odor of moral decay. It is thought that he offers culture, art, manifold intellectual enjoyment, but at the price of virtue, faith, patriotism.

If I have taken a just view, the good and bad characteristics of his writings stand in a different relation. It is not morality itself that he regards with indifference, but one important section of morality. And he is an indifferentist here, partly because he is a man formed in the last years of the old *régime*, partly because he is borne too far on the tide of reaction against Catholic and monastic ideas. Nevertheless, he remains a moralist; and in his positive teaching he is one of the greatest moral teachers the world has ever seen. In his life he displayed some of the greatest and most precious virtues, a nobly conscientious use of great powers, a firm disregard of popularity, an admirable capacity for the highest kind of friendship. His view of life and literature is, in general, not ironical and not enervating, but sincere, manly, and hopeful. And his view of morality and religion, if we consider it calmly and not in that spirit of agonized timidity which reigns in the religious world, will perhaps appear to be not now very dangerous where it is wrong, and full of fresh instruction where it is right. The drift of the nineteenth century, the progress of those reforms in which Goethe took so little interest, have tended uniformly to the elevation of woman, so that it seems now scarcely credible that at the end of the last century great thinkers can seriously have preferred to contemplate her in the half servile condition in which classical poetry exhibits her. On this point at least the world is not likely to become pagan again. On the other hand Carlyle himself scarcely exaggerated the greatness of Goethe as a prophet of new truth alike in morals and in religion. Just at the moment when the supernaturalist theory, standing alone, seemed to have exhausted its influence, and to be involving religion in its own decline, Goethe stood forth as a rapt adorer of the God in Nature.³⁹ Naturalism in his hands appeared to be no dull system of platitudes, no empty delusive survival of an exploded belief, but a system as definite and important as Science, as rich and glorious as Art. Morality in his hands appeared no longer morbid, unnaturally solemn, unwholesomely pathetic, but robust, cheerful, healthy, a twin-sister of happiness. In his hands also morality and religion appeared inseparably united, different aspects of that free energy, which in him was genius, and in every one who is capable of it resembles genius. Lastly, his bearing towards Christianity, when he had receded from the exaggerations of his second period, was better, so long as it seemed hopeless to purge Christianity of its *other-worldliness*, than that of the zealots on either side. He entered into no clerical or anti-clerical controversies; but, while he spoke his mind with great frankness, did not forget to distinguish between clericalism and true Christianity, cherished no insane ambition of destroying the Church or founding a new religion,⁴⁰ and counselled us in founding our future society to make Christianity a principal element in its religion, and not to neglect the “excellent collection of sacred books” left us by the Hebrews. —*Contemporary Review*.

³⁹ “Was kann der Mensch im Leben mehr gewinnen, Als dass ihm Gott-Natur sich offenbare?”

⁴⁰ “Von der Société St. Simonien bitte Dich fern zu halten;” so he writes to Carlyle.

BYGONE CELEBRITIES AND LITERARY RECOLLECTIONS

BY CHARLES MACKAY

I. Daniel O'Connell – Serjeant Talfourd – Robert Carruthers

The three gentlemen whose names appear at the head of this chapter of my reminiscences, breakfasted together at the table of Mr. Rogers, along with our host and myself, in the summer of 1845. They were all remarkable and agreeable men, and played a part more or less distinguished in the social life of the time. Mr. O'Connell called himself, and was called by his friends, the Liberator, but was virtually the Dictator, or uncrowned king, of the Irish people. Serjeant, afterwards Judge, Talfourd, was an eminent lawyer – a very eloquent speaker, and a poet of some renown. Mr. Robert Carruthers was the editor of the *Inverness Courier*, a paper of much literary influence; a man of varied acquirements and extensive reading, particularly familiar with the literature and history of the seventeenth and eighteenth centuries, and more especially with the writings of Pope, his contemporaries and predecessors. Whenever Mr. Macaulay, while engaged on the “History of England,” which, unfortunately, he did not live to complete, was in doubt about an incident, personal or national, that occurred during the reigns of James II., William and Mary, or Queen Anne, and was too busy to investigate for himself, he had only to appeal for information to Mr. Carruthers, and the information was at once supplied from the abundant stores of that gentleman's memory. I was well acquainted with all of these notables, but had never before met the three together.

Mr. O'Connell had long passed his prime in 1845 – being then in his 70th year – but appeared to be in full bodily and mental vigor, and in the height of his power, popularity, and influence. He had for years been extravagantly praised by one half of the nation and as extravagantly blamed and denounced by the other, and his support had been so absolutely necessary to the existence of the Whig and Liberal Ministry in England, that when this support seemed to be of doubtful continuance, or any indications of his present lukewarmness or future opposition were apparent, the baits of power, place, or high professional promotion were constantly dangled before his eyes, to keep him true to the cause to which he had never promised allegiance, but to which he had always adhered with more or less of zeal and consistency. For upwards of a quarter of a century his name figured more frequently in the leading columns of all the most prominent journals of London and the provinces than that of any statesman or public character of the time. As he jocularly but truly said of himself, he was the best abused man in the country; but though he did not choose to confess it, he was, at the same time, the most belauded. He was a man of a fine personal presence, of a burly and stalwart build, with quick glancing eyes full of wit, humor and of what may be called “rollicking” fun; and of a homely, persuasive, and telling eloquence, that no man of his day could be truly said to have equalled. The speeches of his great contemporary and countryman, Richard Lalor Shiel, were more elegant, scholarly, and ambitious; but they were above the heads of the commonalty, and often failed of their effect by being “caviare to the general,” and sometimes tired or “bored” those who could understand and even appreciate them, by their great length and too obvious straining after effect. No exception of the kind could be taken to the speeches of Daniel – or, as he was affectionately called, “Dan” O'Connell. They were all clear as day, logical as a mathematical demonstration, and warm as midsummer. If he had many of the faults he had all the virtues of his Celtic countrymen, and even in his strongest denunciations of his political opponents there was always a touch of humor that forced a laugh or a smile from the persons he attacked. He once, in Parliament, spoke of the great Duke of Wellington as “a stunted corporal with two left legs,” and the Duke of Wellington, who was said to be proud of his legs, remarking to Lucas, the artist who had painted his portrait, pointing to his legs – without taking notice of the facial likeness – “those are my legs,” had sense enough to laugh. The description, however, was not quite original, inasmuch as Pope, more than a hundred years previously, had applied the same epithet to Lintot the bookseller. Daniel O'Connell could excite at will the laughter or the indignation of the multitude, and was not in reality an ill-tempered or an ill-

conditioned man, though he often appeared to be so when it suited his purpose. But though choleric he was never malicious.

On this occasion the conversation was almost entirely literary. O'Connell's voice was peculiarly sweet and musical, and in the recitation of poetry, of which he had a keen and critical appreciation, it was impossible to excel, and difficult to equal him, in either comic or pathetic passages. The manner in which he declaimed "The Minstrel Boy to the War Has Gone," "The Last Rose of Summer," and other favorite songs of Thomas Moore was perfect, and had almost as pleasant an effect upon the hearer's mind as if they had been sung by a well-trained singer. He was, in short, a delightful companion, and fascinated every society in which he felt himself sufficiently at ease to be induced to give free play to his wit, his humor, his imagination, and his wonderful power of mimicry.

Though seemingly at this time in the full high noon of his power and popularity, his influence was in reality on the wane, and circumstances over which he had no control, and which he had done nothing to produce, were at work to divert from his person and his cause the attention and the love of the Irish people. The first symptoms of the mysterious disease in the potato, which was unfortunately the chief food of the Irish millions, began to make themselves apparent, and to divert the attention of the Irish from political to more urgent questions of life and death. The too probable consequences of this great calamity tended necessarily to diminish the rent or tribute collected from the needy as well as the prosperous to recompense the "Liberator" for the sacrifices he had made in relinquishing the practice of his profession to devote his time, talent, and energies entirely to the parliamentary service of the people. Added to this, a race of younger and more impulsive men, fired by his example, had arisen to agitate the question of the Repeal of the Union on which he had set his heart, and scorning, in their impatience, the peaceful and legal methods which he employed, did their best to goad the impulsive people into open rebellion. Foremost among these were Mr. Smith O'Brien, whose futile treason came to an inglorious collapse in a cabbage garden; and next, the members of the party of Young Ireland, and the gifted poets of the "Nation," among whom were Mr. D'Arcy McGee, and Sir Charles Gavan Duffy, whose tuneful violence was far more agreeable to the youthful agitators of the new generation than the more prudent strategy of O'Connell. The potato disease and the fearful famine that followed on its devastating track, which sent at least a million of people to the United States and two millions into untimely graves in Ireland, preyed upon the spirit of the great agitator, impaired his health, and ultimately led to his death of a broken heart, at Genoa, in 1847, in the 72nd year of his age. He was, at the time, on a pilgrimage to Rome to crave the blessing of the Pope, but was not destined to reach the, to him, "holy city," the capital of his faith. His heart, however, was embalmed and taken to Rome, and his corpse conveyed to his native country for interment. I little thought on that joyous morning of 1845, when we sat seriously merry and intellectually sportive at the social board of Mr. Rogers in St. James's Place, that the end was so near, and that the light which shone so brilliantly was so speedily to be extinguished, and the sceptre of democratic authority to be so shattered that none could take it up when it fell from the hands which had so long wielded it.

The second of the guests this morning was also an orator, not celebrated for his power over crowds, but highly distinguished in the Senate and the Forum. Serjeant Talfourd did not speak often in Parliament or at public meetings, but when he did he was listened to with pleasure and attention. The scenes of his triumphs were the law courts, and especially the Court of Common Pleas, where he was the leading practitioner. He was noted among the members of the Bar and the attorneys for his power over the minds of jurymen, and his winning ways of extorting a favorable verdict for the client who was fortunate enough to have him for an advocate. He had room enough in his head both for law and literature – the law for his profit and his worldly advancement, and literature for the charm and consolation of his life. He was well known too, and highly esteemed by the leading literary men of his time, and took especial interest in the laws affecting artistic, musical, and literary copyright. He was largely instrumental in extending the previously allotted term of twenty-eight years to forty-two years, and for seven years after the death of the artist, composer, or author. This measure put considerable

and well-deserved profits into the pockets of the heirs of Sir Walter Scott, and was said at the time to have been specially devised and enacted for that purpose and for that only. This, however, was an error which Serjeant Talfourd emphatically contradicted whenever it was hinted or asserted. It had, incidentally, that effect, which no one was churlish and ungrateful enough to grudge or lament, but was advocated in the interest of all men of letters, and of literature itself in its widest extent, and if it erred at all, only erred on the side of undue restriction to so short a period as forty-two years. It ought to have been extended to the third generation of the benefactors of their country, and probably will be so extended at a future time, when the rights of authors will be as strictly protected – and will be thought of at least as much importance – as the right of landlords to their acres; of butchers, bakers, and tailors to be paid for their commodities; or those of doctors and lawyers to be paid for their time and talents.

Mr. Charles Dickens dedicated to Serjeant Talfourd the “Posthumous Papers of the Pickwick Club” – the early work by which his great fame was established – in grateful acknowledgment of the Serjeant’s services to the cause of all men of genius, in the enactment of the new law of copyright. “Many a fevered head,” he said, “and palsied hand will gather new vigor in the hour of sickness and distress, from your exalted exertions; many a widowed mother and orphaned child, who would otherwise reap nothing from the fame of departed genius but its too pregnant legacy of sorrow and suffering, will bear in their altered condition higher testimony to the value of your labors than the most lavish encomiums from lip or pen could ever afford.”

Serjeant Talfourd was raised to the Bench in 1848, being then in his fifty-third year. This promotion had the natural consequence of removing him from the House of Commons. He was a singularly amiable man – of gentle, almost feminine character – of delicate health and fragile form. He possessed little or none of the staid or stern gravity popularly associated with the idea of a judge, and looked more like the poet that he undoubtedly was, than the busy lawyer or magistrate. He died suddenly in the year 1854, under circumstances peculiarly sad and pathetic. After attending Divine Service on Sunday, the 11th March, in the Assize town of Stafford, apparently in his usual health, he took his seat on the bench on the following morning, and proceeded to address the grand jury on the state of the calendar. It contained a list of more than one hundred prisoners, an unusually large number of whom were charged with atrocious offences, many of which were to be directly traced to intemperance. He took occasion, in the course of his remarks, to comment upon the growing estrangement in England between the upper and lower classes of society, and the want of interest and sympathy exhibited between the former and the latter, which he regarded as of evil augury for the future peace and prosperity of the country. While uttering these words he became flushed and excited – his speech became thick and incoherent, and he suddenly fell forward with his face on the desk at which he was sitting. He was removed at once to his lodgings in the immediate vicinity of the court, but life was found to be extinct on his arrival. Thus perished a singularly able and estimable man, universally beloved by his contemporaries.

Mr. Carruthers, who resided in the little town of Inverness, sometimes called by its inhabitants the “Capital of the Highlands,” was often blamed by his intimate friends for hiding his great abilities in so small a sphere, and not launching boldly forth upon the great sea of London, which they considered a more suitable arena for the exercise of his talents and the acquirement of fame and fortune by the pursuits of literature. But he was not to be persuaded. He loved quiet; he loved the grand and solemn scenery of his beautiful native country, and perhaps if all the truth were told, he preferred to be a great man in a provincial town, than a comparatively small one in a mighty metropolis. In Inverness he shone as a star of the first magnitude. In London, though his light might have been as great, it might have failed to attract equal recognition. In addition to all these considerations, the atmosphere of great cities did not agree with his health, and the fine, free, fresh invigorating air of the sea and the mountains was necessary to his physical well-being. This he enjoyed to the full in Inverness. The editing of the weekly journal, which supplied him with even greater pecuniary results than were

necessary to supply the moderate wants of himself and his household, left him abundant leisure for other and congenial work. He soon made his mark in literature, and became noted not only for the vigor and elegance of his style, but for his remarkable accuracy of statement, even in the minutest details of his literary and historical work. He edited, with copious and accurate notes, an edition of Pope, and of Johnson and Boswell's "Tour to the Hebrides," and greatly added to the value of those interesting books by notes descriptive and anecdotal of all the places and persons mentioned in them. He also contributed largely to the valuable "Cyclopædia of English Literature" edited by Messrs. Chambers, of Edinburgh; besides contributing essays and criticisms to many popular serials and reviews, published in London and Edinburgh. He was one of the most admirable story tellers of his time, or indeed of any time, had a most retentive and abundantly furnished memory, and never missed the point of a joke, or overlaid it with inappropriate or unnecessary words or phrases. His fund of Scottish anecdotes – brimful of wit and humor – was apparently inexhaustible, and his stories followed each other with such rapidity as to suggest to the mind of the listener the beautiful lines of Samuel Rogers:

Couched in the hidden chambers of the brain
Our thoughts are linked by many a hidden chain,
Awake but one, and lo! what myriads rise,
Each stamps its image as the other flies.

The good things for which Mr. Carruthers was famous were not derived from books, but from actual intercourse with men, and if collected, would have formed a finer and more diverting repertory of Scottish wit and humor, than has ever been given to the world. He was often urged to prepare them for publication, and as often promised to undertake the work, but always postponed it until he had more leisure than he possessed at the time of promising. But that day unfortunately never came. If it had come, the now celebrated work of Dean Ramsay on the same subject would have been eclipsed, or altogether superseded in the literary market.

His local knowledge, and the fascination of his conversation were so great, that every person of any note in the literary or political world who visited Inverness, came armed with a letter of introduction to Mr. Carruthers, or made themselves known to him during their stay in the Highlands. The first time that I travelled so far North, through the magnificent chain of freshwater lochs that are connected with each other by the Caledonian Canal, a leading citizen of Inverness, who was a fellow-passenger on the trip, seeing I was a stranger, took the pains to point out to me all the objects of interest on the way, and to name the mountains, the straths, the glens, and the waterfalls on either side. On our arrival at Inverness, he directed my attention to several mountains and eminences visible from the boat when nearing the pier. "That," said he, "is Ben Wyvis, the highest mountain in Ross-shire; that is 'Tom-na-hurich,' or the hill of the fairies; that is Craig Phadrig, once a vitrified fort of the original Celtic inhabitants; and that," pointing to a gentleman in the foremost rank of the spectators on the landing-place, "is Mr. Carruthers, the editor of the *Courier*!"

Mr. Carruthers used to relate with much glee that he escorted the great Sir Robert Peel to the battle-field of Culloden, and pointed out to him the graves of the highland warriors who had been slain in that fatal encounter. Seeing a shepherd watching his flocks feeding on the scant herbage of the Moor, he stepped aside to inform the man of the celebrity of his companion. The information fell upon inattentive ears. "Did you never hear of Sir Robert Peel?" inquired Mr. Carruthers. "Never *dud*!" (did), replied the shepherd. "Is it possible you never heard of him. He was once Prime Minister of England." "Well!" replied the shepherd, "he seems to be a very respectable man!"

On another occasion, he escorted Mr. Serjeant Talfourd and his friend Mr. John Forster, who was also the intimate friend of Mr. Charles Dickens, over the same scene, and was fond of telling the story that the same or some other shepherd shouted suddenly to another of the same occupation at a

short distance on the Moor, “*Ian! Ian!*” Serjeant Talfourd, who was the author of the once celebrated tragedy of “*Ion*,” – with a bland smile of triumph or satisfaction on his face, turned to Mr. Forster, laid his hand upon his breast, and said, “Forster, this *is* fame.” He did not know that *Ian* was the Gaelic for John, and that the man was merely calling to his friend by his Christian name.

Among the odd experiences of the little town in which he passed his days, Mr. Carruthers related that a gentleman, who had made a large fortune in India, retired to pass the evening of his life in his native place. Finding the time hanging heavy on his hands, and being of an active mind, he established a newspaper, sometime about the year 1840. He grew tired of it after two or three years, and discontinued it in a day without a word of notice or explanation. With equal suddenness he resumed its publication in 1850, and addressed his readers, in his first editorial, “Since the publication of our last paper, nothing of importance has occurred in the political world.” Nothing had occurred of more importance than the French Revolution of 1848 – the dethronement and flight of King Louis Philippe – and convulsions in almost every country in Europe, Great Britain excepted.

Mr. Carruthers, who had received the degree of Doctor of Laws a few years previously, died in 1878, full of years and honors, regretted and esteemed by all the North of Scotland, and by a wide circle of friends and admirers in every part of the world where English literature is appreciated; and Scotsmen retain a fond affection for their native country, and the men whose lives and genius reflect honor upon it.

II. Patric Park, Sculptor

I am glad to be able in these pages to render tribute, however feeble, to one of the great but unappreciated geniuses of his time; a man of powerful intellect as well as powerful frame, a true artist of heroic mould and thought, who dwarfed the poor pigmies of the day in which his lot was cast by conceptions too grand to find a market: Patric Park, sculptor, who concealed under a somewhat rude and rough exterior as tender a heart as ever beat in a human bosom. Had he been an ancient Greek, his name might have become immortal. Had he been a modern Frenchman, the art in which he excelled would have brought him not only bread, but fortune. But as he was only a portrayer of the heroic in the very prosaic country in which his lot was cast, it was as much as he could do to pay his way by the scanty rewards of an art which few people appreciated, or even understood, and to waste upon the marble busts of rich men, who had a fancy for that style of portraiture, the talents, or rather the genius, which, had encouragement come, might have produced epics in stone to have rivalled the masterpieces of antiquity.

Patrick, or, as he usually signed himself, Patric, Park was born in Glasgow in 1809, and I made his acquaintance in the *Morning Chronicle* office in 1842, when he was in the prime of his early manhood. He sent a letter to the editor to request the insertion of a modest paragraph in reference to a work of his which had found a tardy purchaser in Stirling, where it was destined to adorn the beautiful public cemetery of the city. The paragraph was inserted not as he wrote it, but with a kindly addition in praise of his work and of his genius. He came to the office next day to know the writer's name. And when the writer avowed himself, a friendship sprung up between the two, which suffered no abatement during the too short life of the grateful man of genius, who, for the first time, had been publicly recognized by the humble pen of one who could command, in artistic and literary matters, the columns of a powerful journal. Park's nature was broad and bold, and scorned conventionalities and false pretence. George Outram, a lawyer and editor of a Glasgow newspaper, author of several humorous songs and lyrics upon the odds and ends of legal practice, among which the "Annuity" survives in perennial youth in Edinburgh and Glasgow society, and brother of the gallant Sir James Outram, of Indian fame, used to say of Park, that he liked him because he was not smooth and conventional. "There is not in the world," he said to me on one occasion, "another man with so many delightful corners in his character as Park. We are all of us much too smooth and rounded off. Give me Park and genuine nature, and all the more corners the better."

Park had a very loud voice, and sang Scotch songs perhaps with more vehemence than many people would admire, but with a hearty appreciation that was pleasant to witness. It is related that a deputation of Glasgow bailies came up to London, with Lord Provost Lumsden at their head, in reference to the Loch Katrine Water Bill, for the supply of Glasgow with pure water, which was then before Parliament, and that they invited their distinguished townsman to dine with them at the Victoria Hotel, Euston Square. After dinner Park was called upon for a song, and as there was nobody in the dining-room but one old gentleman, who, according to the waiter, was very deaf, Park consented to sing, and sang in his very best style the triumphant Jacobite ballad of "Hey, Johnnie Cope, are ye wauking yet," till, as one of the bailies said, "he made the rafters ring, and might have been heard at St. Paul's." The deaf gentleman, as soon as the song was concluded, is reported to have made his way to the table, and apologising for addressing a company of strangers, to have turned to Park and said, with extraordinary fervor and emotion, "May God Almighty bless you, sir, and pour his choicest blessings upon your head! For thirty years I have been stone deaf and have not heard the sound of the human voice. But I heard your song, every word of it; God bless you!"

Upon one occasion, when we were travelling together in the Western Highlands, the captain of one of the Hutcheson steamers was exceedingly courteous and attentive to his passengers, and took great pains to point out to those who were making this delightful journey for the first time all

the picturesque objects on the route. At one of the landing-places the young Earl of Durham was taken on board, with his servants, and from that moment the captain had neither eyes nor ears for any other person in the vessel. He lavished the most obsequious and fulsome attention upon his lordship, and when Park asked him a question, cut him short with a snappish reply. Park was disgusted, and expressed his opinion of the captain in a manner more forcible than polite. As there was a break in the navigation in consequence of some repairs that were being effected in one of the locks, the passengers had to disembark and proceed by omnibus to another steamer that awaited their arrival at Loch Lochy. Park mounted on the box by the side of the driver, and was immediately addressed by the captain, "Come down out of that, you sir! That seat's reserved for his lordship!" Park's anger flashed forth like an electric spark, "And who are *you*, sir, that you dare address a gentleman in that manner?"

"I am the captain of the boat, sir, and I order you to come down out of that."

"Captain, be hanged!" said Park, "the coachman might as well call himself a captain as you. The only difference between you is, that he is the driver of a land omnibus and that you are the driver of an aquatic omnibus." The young Earl laughed, and quietly took his place in the interior of the vehicle, leaving Park in undisputed possession of the box-seat.

His contempt for toadyism in all its shapes and manifestations was extreme. There was an engineer of some repute in his day, with whom he had often come into contact, and whom he especially disliked for his slavish subservience to rank and title. The engineer meeting Park on board of the boat, said, "Mr. Park, I wish you not to talk about me! I am told that you said, I was not worth a damn! Is it true?" "Well," replied Park, "it may be; but if I said so I underrated you. I think you are worth two damns, and I damn you twice!"

On another occasion, when attending a *soirée* at Lady Byron's, he was so annoyed at finding no other refreshment than tea, which he did not care for, and very weak port wine negus, which he detested as an unmanly and unheroic drink, that he took his departure, resolved to go in search of some stronger potation. The footman in the hall, addressing him deferentially in search of a "tip," said, "Shall I call your carriage, my lord?" "I'm not a lord," said Park, in a voice like that of a stentor. "I beg pardon, sir, shall I call your carriage?" "I have not got a carriage! Give me my walking stick! And now," he added, slipping a shilling into the man's hand, "can you tell me of any decent public-house in the neighborhood where I can get a glass of brandy-and-water? The very smell of her ladyship's negus is enough to make one sick."

Park resided for a year or two in Edinburgh, and procured several commissions for the busts of legal and other notabilities, and, what was in a higher degree in accordance with his tastes, for some life-size statues of characters in the poems and novels of Sir Walter Scott, to complete the Scott monument in Princes Street. He also executed, without a commission, a gigantic model for a statue of Sir William Wallace, for whose name and fame he had the most enthusiastic veneration, with the idea that the patriotic feelings of the Scottish nation would be so far excited by his work as to justify an appeal to the public to set it up in bronze or marble (he preferred bronze,) on the Calton Hill, amid other monuments to the memory of illustrious Scotsmen. But the deeds of Wallace were too far back in the haze of bygone ages to excite much contemporary interest. The model was a noble work, eighteen feet high, and wholly nude. Some of his friends suggested to him that a little drapery would be more in accordance with Scottish ideas, than a figure so nude that it dispensed even with the customary fig-leaf. Park revolted at the notion of the fig-leaf, "a cowardly, indecent subterfuge," he said. "To the pure all things are pure, as St. Paul says. There is nothing impure in nature, but only in the mind of man. Rather than put on the fig-leaf I would dash the model to pieces." "But the drapery?" said a friend, the late Alexander Russel of the *Scotsman*. "What I have done I have done, and I will not spoil my design. Wallace was once a man, and if he had lived in the last century and I had to model his statue, I would have draped it or put it in armor as if he had been the Duke of Marlborough or Prince Eugene. But the memory of Wallace is scarcely the memory of a man but of a demigod. Wallace is a myth; and as a myth he does not require clothes." "Very true," said Russel,

“but you are anxious to procure the public support and the public guineas, and you’ll never get them for a naked giant.” “Then I’ll smash the model,” said the indignant and dispirited artist. And he did so, and a beautiful work was lost to the world for ever.

At the time of our first acquaintance Park was somewhat smitten by the charms of a beautiful young woman in Greenock, the daughter of one of his oldest and best friends. The lady had no knowledge of art, and scarcely knew what was meant by the word sculptor. She asked him one day whether he cut marble chimney-pieces? This was too much. He was *désillusionné* and humiliated, and the amatory flame flickered out, no more to be relighted.

Park and I and three or four friends were once together on the top of Ben Lomond, on a fine clear day in August. The weather was lovely, but oppressively hot, and the fatigue of climbing was great, but not excessive. At the summit, so pure was the atmosphere that looking eastward we could distinctly see Arthur’s Seat, overlooking Edinburgh, and the Bass Rock in the Firth of Forth, twenty miles beyond. Looking westward, we could distinctly see Ailsa Craig in the Firth of Clyde. Thus the eye surveyed the whole diameter of Scotland. By a strange effect of atmosphere the peak of Goatfell in Arran, separated optically from the mountain by a belt of thick white cloud, seemed to be preternaturally raised to a height of at least 20,000 feet above the sea. I pointed it out to Park. “Nonsense!” he said. “Why Goatfell would be higher than the Himalayas if your notion were correct.” “But I know the shape of the peak,” I replied; “I have been on the top of Goatfell at least half-a-dozen times, and would swear to it, as to the nose on your face.” And as we were speaking the white cloud was dissipated, and the Himalayan peak seemed to descend slowly and take its place on the body of Goatfell, from which it had appeared to have been dis severed. “Well,” he said, “things are not what they seem, and I maintain that it was as high as the Himalayas or Chimborazo while the appearance lasted.”

The mountain at this time shone in pale rose-like glow, and Park, inspired by the grandeur of the scene, preached us a very eloquent little sermon, addressing himself to the sun, on the inherent dignity and beauty of sun-worship as practised by the modern Parsees and the ancient Druids. He concluded by a lament that his own art was powerless to represent or personify the grand forces of nature as the Greeks had attempted to do. “The Apollo Belvidere,” he said, “is the representative of a beautiful young man. But it is not Apollo. Art can represent Venus – the perfection of female beauty, and Mars – the perfection of manly vigor; but Apollo; no! Yet I think I would have tried Apollo myself if I had lived in Athens two thousand years ago.”

“A living dog is better than a dead lion.”

“True,” said Park, “I am a living dog, Phidias is a dead lion. I have to model the un intellectual faces of rich cheesemongers, or grocers, or iron masters, and put dignity into them, if I can, which is difficult. And when I add the dignity, they complain of the bad likeness, so that I often think I’d rather be a cheesemonger than a sculptor.”

I called at Park’s studio one morning, and was informed that he every minute expected a visit from the great General Sir Charles James Napier – for whose character and achievements he had the highest admiration. He considered him by far the greatest soldier of modern times – and had prevailed upon the general to sit to him for his bust. Park asked me to stay and be introduced to him, and nothing loth, I readily consented. I had not long to wait. The general had a nose like the beak of an eagle – larger and more conspicuous on his leonine and intellectual face than that of the Duke of Wellington, whose nose was familiar in the purlieu of the Horse Guards. It procured for him the title of “conkey” from the street urchins, and I recognised him at a glance as soon as he entered. On his taking the seat for Park to model his face in clay, the sculptor asked him not to think of too many things at a time, but to keep his mind fixed on one subject. The general did his best to comply with the request, with the result that his face soon assumed a fixed and sleepy expression, without a trace of intellectual animation. Park suddenly startled him by inquiring, “Is it true, general, that you gave way – retreated in fact – at the battle of – ?” (naming the place, which I have forgotten). The general’s

eyes flashed sudden fire, and he was about to reply indignantly when Park quietly remarked, plying his modelling tool on the face at the time, "That'll do, general, the expression is admirable!" The general saw through the manœuvre, and laughed heartily.

The general's statue in Trafalgar Square is an admirable likeness. Park was much disappointed at not receiving the commission to execute it.

Park modelled a bust of myself, for which he would not accept payment. He found it a very difficult task to perform. I had to sit to him at least fifty times before he could please himself with his work. On one occasion he lost all patience, and swearing lustily, *more suo*, dashed the clay into a shapeless mass with his fist. "D – n you," he said, "why don't you keep to one face? You seem to have fifty faces in a minute, and all different! I never but once had another face that gave me half the trouble."

"And whose was the other?" I inquired.

"Sir Charles Barry's" (architect of the Houses of Parliament at Westminster). "He drove me to despair with his sudden changes of expression. He was a very Proteus as far as his face was concerned, and you're another. Why don't you keep thinking of one thing while I am modelling, or why can't you retain one expression for at least five minutes?"

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