

principle is doubtful, because of the difficulty or impossibility of drawing clear distinctions between harmless and dangerous societies and creeds. When once a departure is made from the sound maxim in legislation that a man is to be judged by his deeds, not his beliefs, personal freedom and the rights of conscience are menaced. There is, moreover, room for question whether the path of national safety does not lie in the direction of encouraging incomers to assume the responsibilities and enjoy the rights and privileges of citizenship, rather than in the opposite direction. The existence in any community of a considerable class of residents, who are not permitted to become citizens, can scarcely tend to internal peace and security.

THE providence that evolves good out of evil will, it may be believed, cause the recent brutal butchery of Siberian exiles by Russian soldiers and guardsmen, to result in at least some mitigation of the barbarous system of wholesale banishment to Siberia. The details of the slaughter, as furnished by a correspondent of the *London Times* from information communicated by survivors to friends of the exiles, almost surpass belief, yet have a verisimilitude which leaves little doubt in the mind of the reader of their substantial truthfulness. The prime mover in the affair seems to have been the incompetent or malicious Vice-Governor of Takoutsk, who issued a stupid or murderous order which required the exiles with their guards to set out on a journey of ten or fifteen days into the interior, across the frozen and uninhabited desert, under conditions which must have inevitably caused all to perish miserably on the way. The joint protests of the exiles against these impossible conditions were construed into an act of insurrection, and their subsequent hesitation to follow a police officer from the house to which they had been ordered to the government offices, when they had previously been distinctly forbidden to appear again at those offices, was quickly followed by a furious assault and indiscriminate slaughter by a troop of soldiers. All attempts at explanation were useless. In their frenzy a few who had revolvers for defence against wolves and other animals likely to attack them in the march resisted, and the Vice-Governor, an officer and a soldier were wounded. Of the total number of about thirty, including three or four friends who had come to visit the prisoners, six were killed, and nine wounded. The tragedy was fittingly wound up with a court-martial, instituted by order of the Governor of Eastern Siberia, General Ignatieff, brother of the celebrated diplomatist. The pretext for the court-martial was that the simultaneous presentation of thirty similar petitions against an official decree constituted an act of insurrection. No one was allowed to defend the prisoners. They were not even shewn the indictment against them. After what was, according to the account given, no better than a mock trial, three of the survivors were condemned to death, four to penal servitude for life, six for twenty years, four women to hard labour for fifteen years, and the rest to penal servitude for periods ranging from eight down to three years. One only, who had not been present till all was over, was acquitted. And these exiles, be it remembered, were not convicts. They had been proved guilty of no offence, had not even been arraigned before any court, but were simply banished as political suspects. Bernstein, one of the three condemned to death, had been pierced by four bullets in the massacre, and had been borne in his bed to the court-martial, and was conveyed in the same way to the gallows, where the sentence was carried out by placing the rope around his neck, and removing the bed from under him. A few moments before his execution he penned to his friends and comrades a letter full of lofty patriotism and an almost sublime faith in the ultimate triumph of right and freedom in his "poor, poor country." "Not an atom of force," said he, "is lost in this world. Therefore the life of a man cannot be lost." It may surely be hoped that there is truth in the report which represents the Czar as scandalized by the affair, and even disposed to consider seriously whether it pays to continue a despotic practice which leads to such horrors, and earns for his Government the reproaches of the civilized world.

AN interesting account is given in the *Engineering and Mining Journal* of December 7th of a completely worked out design which has lately been submitted to inspection for an ocean-going steamship which shall shorten the voyage to Europe to four days and twelve hours, or thereabouts. The principle upon which the designer works is to abandon the freight business entirely and carry only passengers, leaving the transportation of merchandise to slower boats. The *Journal* fully approves this departure and pronounces the designer's plans rational and the economical calculations reasonable as well.

THE CENTENARY OF AMERICAN SCIENCE

ON the 21st of November the American Philosophical Society celebrated at Philadelphia the centenary of the occupation of its Hall by the oldest Scientific Society of the New World. It had for its first secretary, Franklin, and for its early members, Jefferson, Boersted, and others of the foremost men of the time. The Hall, which stands alongside of the relic venerated by Americans as the hall in which the Declaration of Independence was signed, is about to be demolished, along with other neighbouring buildings, so as to leave the one historic edifice to grace Independence Square; and this, with the recurrence of the centennial anniversary, led to the celebration, in which representatives from Harvard, Yale, Princeton, Baltimore, Washington, and other American Universities, as well as from Toronto and the Royal Society of England, took part.

At the banquet which crowned the proceedings, special themes were assigned to the chosen speakers. To Sir Daniel Wilson, as the Canadian representative of Science and Letters, the following theme was apportioned; and we are now enabled to produce the address then delivered by him from proofs in advance of the printed report of the celebration now in preparation by the Society:—

"All Research into the Book of Nature has Not Discovered an Erratum."

ADDRESS BY SIR DANIEL WILSON, LL.D., PRESIDENT OF THE UNIVERSITY OF TORONTO.

Mr. President, and fellow members of the American Philosophical Society:

In the part which you have assigned to me in this centennial commemoration, I find myself called upon to deal with a subject the compass of which is wholly beyond my powers, as it is all too ample for the limited time available. In the eloquent address in which you, Mr. President, retraced the history of this, the oldest among the scientific societies of America, you found an hour too brief for a review of the events of the century which today completes its cycle; and now I find myself called upon, in the briefer limits at my disposal, to verify the entire Book of Nature, and demonstrate the faultless perfection of the record. Looking back over the immeasurable ages of the past, and turning to the equally incomprehensible vastness of the visible universe, hours, instead of minutes, would fail in the most superficial effort at such a review.

Amid the brightness of this festive commemoration the temptation is rather to leave the past unheeded and to take the wings of fancy—or, better still, the intuitions of science—and anticipate the marvels of the coming time; those fairy tales of science that surpass all the wonders of romance. But your behest must be obeyed; and it will, perhaps, most aptly meet present requirements, if I select from the manifold phases which challenge our consideration two suggestive aspects of the comprehensive subject, which in some sense may serve to epitomise the past and the present for such a brief review.

When the fiat went forth, formulated in words that might fitly constitute the motto of this the oldest among the philosophic fellowships of the New World: "Let there be light!" the abyss flashed into cosmic brightness and beauty; and the illimitable depths of space, illumined with the splendour that enkindled suns and awoke the myriad worlds to life, traced for us the first page in the Book of Nature. Your theme invites our attention to it under the apt metaphor of a book: no chance medley of the materialist or mere evolution of time out of chaos; but a volume of well-ordered method and sequence, revealing on every page the purpose and design of its Author. Turning, then, to the pages of this ample volume, astronomy is the science which, dealing with the visible present appeals even to the uncultured mind—to the Syrian shepherd, as to the Indian hunter on the prairies—in proof of an all-mighty, and all-wise Creator. With upturned eyes, savage and sage alike peer into the immeasurable depths of space lighted up with its galaxy of worlds and suns, marshalled in such harmonious symmetry that they unmistakably reveal the evidence of design, order and law; the governance of a Supreme intelligence. Nor is the royal psalmist alone in learning from them the lesson of devout humility, as he considered the heavens, the work of God's hand, the moon and the stars which He has ordained, and realised the marvellous compass of that overruling Providence that can still be mindful of the meanest of His creatures.

The old Greek, perplexed though he was by the misleading complexities of a stellar universe revolving, as it seemed to him, around our own little planet, nevertheless realized such a rhythmical harmony and beauty in the motions of the heavenly bodies—cycle on epicycle, orb on orb—that he listened if perchance he might catch some echo of the music of the spheres which seemed inseparable from that stately measure of their nightly round. The same fascinating idea is revived by our own Shakespeare, in lighter mood, when his Venetian lovers meet in the moonlit gardens of Belmont. I say, in its amplest sense, "our Shakespeare;" for in this reunion with so choice a gathering of American friends it is pleasant to recall the community which we realize in the matchless literature of our mother tongue. With an altogether peculiar bond of kinship, akin to that recognized among the remotest wanderers from the Hellenic Fatherland: on the Euxine, at Cyrene, Masala, or in furthest colonial outposts on the Iberian shores, we "who speak the tongue that Shakespeare spake, the faith and morals hold that Milton held,"

may surely claim to be one. And so, as such, with Shakespeare for our guide, we renew the fond imaginings of the old Greek, as Lorenzo in that moonlight meeting with his bride, in "The Merchant of Venice," points her to the floor of heaven, all thick inlaid with patines of bright gold, and exclaims:

There's not the smallest orb in all the heaven
But in its motion like an angel sings,
Still quiring to the young-eyed cherubim.
Such harmony is in immortal souls;
But while this muddy vesture of decay
Does grossly close us in, we cannot hear it.

Thus, as it would seem, not alone the gaze of the wondering onlooker, but the combined research of ages concur in the verdict which your thesis affirms. We, too, in the spirit of the old Greek, may assuredly recognize the perfect harmony and order which everywhere reveals a Creator's hand.

Alike in the splendour of that universe which greets our eyes as with optic glass we strive to fathom its mysteries, and to interpret its chronicle as a page of nature's volume, and in the minutest atom that the microscope reveals, we recognize the consistent harmony of a Divine law-giver. For the same law that moulds a tear, and shapes a dew drop, holds the planets in their course and regulates the form and motions of suns and worlds. The astronomer, with ever increasing aids of science, penetrates into remoter depths of space only to bring back fresh evidence of an all pervading harmony amid its countless members. In confident reliance on the orderly movements of the planets, Leverrier and Adams independently wrought out results by means of which the telescope of the observer was pointed to the unheeded speck, invisible to the naked eye; and the planet Neptune was added as a new member of our solar system. The science of chemistry, too, unexpectedly directing its operations to a sphere which had hitherto seemed to be wholly beyond its province, by means of spectrum analysis brings back to us the reassuring disclosure that amid endless diversities in their combinations the remotest of those suns that light up the firmament are fashioned of the same elements as this little planet-home of man. Such are some of the teachings of science. But even the untutored eye sees enough in that mysterious vault that nightly spans for him life's fleeting hour, lit up with the splendour of its myriad suns, and the star-strewn Milky Way, to realize that no errata need be appended to the volume of nature. It may be that every star is the centre of a system of worlds, the abode of intelligences more gifted than we are to interpret the wondrous volume; but this at least we do know, that they shine for us lighted up from the same source which enkindles the central luminary of our little group of planets; stirs our earth in its winter's sleep; quickens the buried seed, and the dormant animal life; and is but another aspect of that force which moves the worlds.

Thus we recognize the indices of an all-pervading harmony disclosing to every eye evidence of rule, of law, and so of the divine Lawgiver, alike in the orderly movements of suns and planets, and in the mysterious wanderings of the comet that blazes in the splendour of its perihelion, and then returns in darkness to unknown depths of space. This is for us a living present. But so also, in another chapter of the volume of nature we learn of the same harmonious reign of law through countless ages. Geology is the record of the past; and with its aid I invite you to turn for a moment to that testimony of the rocks which the palæontologist has deciphered for us; testimony which embodies the history of life through all the æons back to the eozoic dawn. Biologist and palæontologist had alike recognized the orderly progression, as, in apt accordance with your metaphor, they turned over page after page of graven strata, till the record of life closed—or seemed to close—in the azoic rocks. But the great naturalist, Charles Darwin, who so recently passed away, has revolutionized biological science with the demonstration of that process of evolution which has guided all the manifestations of life from the lowest to higher forms. Here accordingly a new reign of law appears, as we recognize one after another of the progressive steps through which, in the calm, unresting process of evolution, life has advanced onwards and upwards into ever more complex forms; through countless ages fashioning the present out of all the past. Yet here I, for one,—I know not how few others may sympathize with me,—but I am constrained to pause upon the threshold of that essentially distinct sphere of the psychologist when man, with reason as his distinctive attribute, stands apart from the whole irrational creation. It is not as a mere matter of sentiment, nor even because of any too literal reading of the narrative of creation when man "became a living soul," that I feel constrained to withhold assent to the hypothesis of the evolution of mind. By no inductive process does it seem to me possible to find the genesis of reason in the manifestations of intelligence in the brute creation. The difference between a Newton and an Australian savage is trifling when compared with the great gulf that separates the latter from the highest anthropoid. I look in vain in all the manifestations of instinct or rationality in the latter for any germ of a moral sense, of a spirit of religious worship, or the anticipations of that higher life and immortality which Socrates, Plato and the wisest of heathen philosophers shared with Paul and Augustine, and which are dimly present even in the savage mind. I feel constrained to reject, even as an hypothesis, the gift of reason and the "living soul" by any conceivable process of descent. All the arguments based on heredity and environment, instead of helping to account for the exceptional genius of