

MAKING THE WORLD SAFE FOR SCIENCE.

H. DEF. WIDGER, STATE TEACHERS COLLEGE, CHARLESTON.

In Greek Mythology there is a figure of heroic proportions that has always exercised a strange fascination over the imaginations of men,—Prometheus the Fire-bringer, one of the brood of mighty Titans. According to one version of this ancient myth Prometheus was the creator of man, whom he loved as a creator should love his creature. But according to other versions he was only a friend of man. Legend has it that when Prometheus beheld men struggling along without fire, unable to forge the metals and to combat the severe cold of winter, a vast pity seized him, and he resolved to give men fire from the hearths of heaven to alleviate their suffering and to promote their happiness; and, although Zeus the Thunderer had strictly forbidden any one to take coals from the sacred hearth, Prometheus stole the divine fire, bestowed it upon his favorites, and brought upon himself the wrath of the immortals. For this daring theft, he was cruelly punished. Thus Prometheus has come to be a symbol to the civilized world of all those who are benefactors of mankind, the givers of the arts and of happiness.

But there is another story to which I wish briefly to refer—Frankenstein, a tale written by Mary Wollstonecraft Shelley. Frankenstein was a young Swiss university student, tremendously interested in science, who set before himself no less profound a research problem than to discover the secret of life. After months of patient, painstaking labor he made the great discovery, and set about the task of making a huge machine man and endowing it with life. This, after months more of exhausting work, he accomplished; but when he beheld the monster, his heart was filled with misgivings so deep that he refused to own the creature as his own child and abandoned it to its fate. The leering, staring, ugly creature left Frankenstein, who thought that he had seen the last of the evil thing. Imagine the horror, then, with which Frankenstein learned that this creature had set out to kill all those whom Frankenstein most dearly

loved. Brother, father, wife,—all fell victims to the monster's ruthless cruelty. Too late Frankenstein realized that he had created not a man, but a horrible monster without a soul,—heartless, cruel, cunning, vengeful. The story ends with Frankenstein in vain pursuit of the terrible being in hopes that he might end what he began, destroy that which he created.

Prometheus and Frankenstein! Both possessed similar motives, but the one conferred upon mankind the instrument of human happiness; the other the instrument of human destruction and misery. One gave the world the fire of heaven; the other a hellish fiend. These two figures have been presented to give concreteness to a question now to be asked. Is modern science to be Prometheus or Frankenstein in our civilization, the instrument of this world's salvation or the diabolical instrument of its destruction?

Probably the most outstanding events of the past century and a half were the rise of science and the scientific method of thinking, together with the application of science to life. From many points of view, the great adventurers of the past have not been those who pushed across unknown continents of snow and ice but the scientists who in the quiet of their laboratories explored the world of the atom or of the plant or animal cell in quest of the hidden secrets of life and matter. To me, they were like Ulysses of old who desired

“To follow knowledge like a sinking star
Beyond the utmost bound of human thought.”

In the realm of the pure sciences of physics, chemistry, biology, astronomy, mathematics, they have met with astounding success. It is not necessary to enumerate to a body of scientists the advances in knowledge made by these devotees to truth in their respective fields. What they have learned has made it necessary for us to reconstruct our ideas of the universe in which we live.

But not alone in the pure sciences were such strides forward taken, but in the application of science as well. As a direct result of the application of science to industry came the Industrial Revolution with its momentous

changes in social and economic life. Animated by a spirit comparable only to that of the old buccaneers, these applied scientists, building upon the discoveries of the pure scientists, exploited all fields of human activity. They tunneled mountains, united oceans, spanned rivers, harnessed cataracts, ransacked the bowels of the earth. They built great cities of stone and steel and cement, and tied them together with ribbons of iron. They have sent their voices careering to the uttermost parts of the earth in the twinkling of an eye. They have eliminated distance, checked the ravages of disease, lengthened life, rejuvenated old age. They have taught men to soar like eagles and to swim beneath the waves like fish. They have manufactured lightning. Science has made possible the invention of machines so much more productive than anything men dreamed of a century ago that our very social and economic theory has been modified. Once the problem of industry was to produce enough goods to supply the world's needs; today it is how to arouse in men's minds new desires and new appetites urgent enough to lead them to consume all that industry can produce. Once industry feared famine; now it worries about over production.

And yet wonderful as is modern civilization, there are those who would have us believe that we are even now on the threshold of discoveries which will make our boasted life of today seem cheap and tawdry. J. B. S. Haldane, for instance, has given us a picture of civilization a hundred years from now, modified by what science will make possible. He shows us a world utilizing new sources of power to the abandonment of coal, using processes of manufacturing sugar that will make sugar as common and as cheap as saw dust, regulating by applied genetics the sex of children born, possibly manufacturing in biological laboratories synthetic babies (*mirabile dictu*). To be sure there is a merry twinkle in Mr. Haldane's eye and a slight twitch about the mouth that warns the gentle reader not to take him too seriously.

When we turn from the future sketched for us by the staid and owl-eyed university professor to the future

as seen by the dreamer, like H. G. Wells—the novelist,—we are struck by the similarity of the two pictures. In two of his more recent novels—"Men Like Gods" and "The Dream"—Mr. Wells has undertaken to show us a purely scientific world from which all disease germs have been banished, over population scientifically checked, prejudice and hatred and stupidity eliminated. To both scientist and dreamer science is Prometheus who bestows upon mankind the fire of heaven.

It is almost like waking from a beautiful dream by falling out of bed to read on the first page of a little book by Bertrand Russell these words:

"The changes wrought by science have been partly good and partly bad; whether in the end science will prove to have been a blessing or a bane to mankind is, to my mind, still an open question."

And to read in a recent magazine article this—

"Science has given us more ways than ever before of frittering away our time. It has taught us more about large scale methods of killing one another and destroying property. But it is a question whether, on the whole, science has yet added much to the subtler aspects of human happiness."

To be sure, we might dismiss these two writers as weeping philosophers, but it would be the better part of wisdom to hear what they have to say in support of their assertions. We may let Mr. Russell speak.

If man were a rational being, says Mr. Russell, science might and probably would increase his happiness and well being; but whatever else he may be, he is not a rational creature, but rather a bundle of instincts and passions so deeply rooted in life that even education has done but little to remove them. The biologists say that an animal in a stable environment, if it does not die out, soon adjusts itself to its environment, i. e., acquires an equilibrium between its passions and the conditions of life. But science has suddenly and radically changed these conditions with the result that man's moral and social balance has been upset. Nature has changed rapidly, but human nature has changed almost imperceptibly. Thus science has given those who have power

the means of realizing their purposes more fully than ever before. If their purposes are good, then civilization has gained; but if their purposes are evil, then science may become an actual menace.

No one claims that science is a substitute for virtue. If then science has merely multiplied man's means of satisfying his desires without having changed the quality of those desires, then it may well turn out that, like Frankenstein, we have created in science a monster that will kill the very things we cherish and curse us with the evil for which it may be used. Has science given us more self control, more kindness, more power of discounting our passions? To what use was science put during the Great War? To the relieving of pain, to the saving of life, you say. Yes, but also to the making of deadly poisonous gasses and liquid fire to hurl on human beings; to the throwing of great shells on priceless treasures of art; to the starving of men, women, and children. Are these the gifts of Prometheus or of Frankenstein? Is the world yet safe for science? The tiger and the ape still live within us, with apparent vigor. We are as Touchstone would say, "in a parlous state." What can education do to furnish us escape?

Two things clearly must be done better than they have been and are being done. First, we must extend the scientific method of thinking; and, second, we must make a greater use of art in changing the quality of men's desires, emotions, passions. The one is the way of the brain; the other is the way of the heart.

The advances made by sciences were not the result of blind accidental forces. Scientific progress came only because scientists were animated by a spirit and made use of a method. Before they could perform modern miracles, they had to evolve a method of thinking. They had to cast aside every superstition that hindered, to divest themselves of all forms of prejudice, to discipline their minds to deal with facts dispassionately, to strip their minds of every passion but one—the passion for truth—and, when the truth was found, to face it unflinchingly with a fine disregard for the consequences.

The spirit of the scientist is the spirit of the humble learner, laboring without prejudice or rancor.

Does it not seem passing strange that so shining an example as the modern scientists has produced so little effect upon the great mass of thinking? The truth is, asserts James Harvey Robinson in his "Mind in the Making," that outside of science, the world has never tried intelligence on any large scale. In the midst of all the changes about us the human mind has changed but little. Thus, while we are living in the environment of the twentieth century, our thinking is still too much that of the Dark Ages. We nurse our prejudices, hug our delusions, and repeat outworn shibboleths in politics, religion, social life, and even education. It is the first business of education to attempt to emancipate the mind from narrowness and prejudice.

But education must do more than that if it is to make the world safe for science. It must attempt more seriously than ever before to change the quality of the great mass of emotion that remains. Emotions play a large part in life. If we could only find some way of transforming the baser emotions into the nobler ones, emotional alchemy as it were, how fortunate we would be! But how can we substitute unselfishness for selfishness, sympathy for envy, love for hatred, good for evil? There are two possible approaches, only one of which the public school can concern itself with in our system of education. They are religion and art. Of the first we shall say nothing, but we must pause briefly to discover, if possible, the service which art may render through purging and refining human passions.

"The mother who seeks to soothe her crying child preaches him no sermon. She holds up some bright object and fixes his attention. So it is with the artist; he makes us *see* and *feel*. He brings the world before us. The world becomes a spectacle. The artist takes up some fragment of existence, transfigures it, and shows it. Lo! There it is. The spectator is filled with enthusiastic joy and the transcendent adventure of existence is justified."

So writes Havelock Ellis in "The Dance of Life." Religion is the soul's search for salvation; science is the soul's thirst for the reason of things; art is the soul's thirst for beauty. There is this noteworthy characteristic of the aesthetic contemplation of any work of art; it engenders neither hatred nor envy. Unlike the things that appeal to the possessive instinct, aesthetic contemplation brings men together and increases sympathy among them. And herein lies the potential power of art in our civilization. Art speaks a universal language and obliterates those things which divide men. Our education must be so organized that those art objects are presented which arouse and develop those emotions which bind men together, and submerge those emotions which separate and divide them.

"Art," say Albert Wiggam in *The New Decalogue of Science*, "is the Ark of the Covenant in which all ideals of beauty and excellence are carried before the race. Science deals with matter and energy, but art deals with life. Four-fifths of life are not in the realm of science at all. They lie in the field of beauty, art, imagination, dreams. And it is only when art can give men beautiful dreams that they will progress in mind and person toward that 'sweet fulfillment of the flesh'—beauty."

Art is the flowering of the human spirit; man's highest and deepest criticism of himself; the interpretation of his passions, his hopes, his fears, his vices, his virtues, his foolishness; the expression in imperishable forms of his dreams and aspirations. It is the artist and he alone who

".....sees in the mould the rose unfold,
The soul through blood and tears."

and who reveals for us what he sees. If he be a poet, he expresses it in a *Paradise Lost*; if a musician, in a *Ninth Symphony*; if a sculptor, in a *Venus de Milo*; if a painter, in *The Dance of the Nymphs*.

Recently it was the speaker's good fortune to hear the Russian Symphonic Choir. When the beautiful strains of the "Lord Have Mercy" were reached, he was completely melted. If he had thought of his enemy on coming into the room, that enemy was dead now; if he had

thought mean, selfish thoughts, he did no more. One could not listen to music like that and plan a wicked or an ugly deed. Said Shakespeare,

“Music hath charms to soothe the savage breast”

and in the Merchant of Venice he makes Jessica say,

“The man who hath no music in his soul
Is fit for treasons stratagems and spoils.”

What is true of music is true also of pictures. Beautiful pictures can

“Cleanse the stuffed bosom of that perilous stuff
Which weighs upon the heart.”

In his little book “Education as World-Building” Thomas Davidson tells us that if each individual is to build that harmonious inner world which shall satisfy the desires of the soul, our education must take care to present those objects which shall awaken the desires we wish to cultivate, then develop those desires by repeated exercise into habits. By failing to present other objects, certain desires will either never be awakened, or if awakened, slowly atrophy. The desires aroused by the Age of Innocence, or Raphael’s Madonna can hardly be other than good.

There is no time here to speak of sculpture or architecture, and the speaker does not know enough about them to speak convincingly. But he does know that on the few occasions on which he has looked upon Shaw’s Memorial Bronze Relief on Boston Commons facing the State House, a something flowed from the bronze into his soul, a something that lifted and inspired until he felt like exclaiming with Macbeth,

“I dare do all that may become a man;
Who dares do more is none.”

But there remains literature, that one of the fine arts which uses life as its stuff and language as its medium. Its primary appeal is to the feelings, which it exalts and purifies. In the tragedy of the Greeks there was what was called “Katharsis”—the purging of the soul through the emotion of pity. Great literature always has something akin to this power.

The aim of the poet is still the ancient quest for beauty, order, harmony in life. He conducts that search with a zeal that refuses to be daunted, no matter how miserable, ugly, or painful life itself may be. Great poetry is greatest when it touches the universal longing for a perfect world. After all, the poets are men and women haunted by sights and sounds which to ordinary mortals are but darkness and silence. Poets are the true seers and listeners without whom we would still be blind and deaf. It is not the poet's business to make a new world but to advocate it; not to save men's soul, but to make men's soul's worth saving.

Lost in a book! May be sailing the wine-dark sea with Odysseus; descending into Hell with Dante and Vergil; exploring the soul with Browning; plumbing the depths of human misery with Victor Hugo; or triumphing over death and grief with Tennyson,—these are the mountains of transfiguration.

"Ah," some one says, "how transitory are these sublime moments!" True. But for one transcendent moment they were real, and while they lasted we were men like Gods. And even the memory of those moments is potent. Art is, indeed, a factor in human happiness, because by its means common men are made partakers of the vision of uncommon men.

Is then, science to be Prometheus or Frankenstein? It all depends. The issue lies not with the gods but with men. If men use science as a means of extending power over nature, but refuse at the same time to use art as a means of extending power over human passions, it may turn out, as some think that like Frankenstein's creature, science may become a curse. But it need not be so. There is no conflict between science and art; rather they complement and supplement each other. The Greeks thought that education consisted in teaching to love and hate correctly, and Plato said that the true aim of education should be to give "the body and the soul all the beauty and perfection of which they are capable." Meister Eckhart said, "A man is what he loves." If through art we can make men love truth rather than prejudice.

light rather than darkness, beauty rather than ugliness; if we can get men to love the beauty of noble music, noble pictures, noble architecture, noble literature, and to despise jazz, cheap pictures, mean architecture, and ignoble literature, we shall be doing something to proclaim the reign of Prometheus and to make the world, not safe for democracy, but for science.