

THE APPLIED SCIENCES AS A MEANS OF MORAL UPLIFT OF MAN

The opinion of the ancient people that mechanics does not befit the free and educated man, is preserved even during the Middle Ages. Only the knight-hood was thought of as a profession so to speak of dignified men. In a French dictionary of 1680, under the word «mechanics», we read the following: «The word is opposed to the idea of freedom and honor» and further below, in metaphoric use, it denotes the humble, the ugly and the least becoming to an honorable and free man».

That was the prevailing opinion then.

But the indomptable force of necessity, mother of every practical discovery, which Archimedes scorned (inspired from the then prevailing ideas of the philosophers, he disliked the construction of machines of practical uses, as unworthy of a true philosopher and scientist), gradually began to take over.

Thus, among the masterpieces and inventions of the artists, the instruments of war, naturally, show progress, for example the Greek liquid fire of Callinicos, the bronze guns, gunpowder which shows its tremendous power in its small quantity etc. The chief representative of this new direction is Bacon known as «Doctor Mirabilis». A radical scorning the dogmatic and scholastic philosophy (in contrast to Aristotle he views the philosophical problems as stagnant and static and thinks that technology alone changes life continuously) he urges and exhorts experimentation. Later on, Francis Bacon introduced a new method in science: «Let us not imitate, he says, the spider who weaves its web from its own substance, but the bee who changes to honey the sap from the flower».

The brightness of his ideas was rewarded at the end with the darkness of the prison, where he lived the last years of his life with the accusation of his teaching suspicious innovations.

Later great philosophers of the 17th century, freed from the scholasticism of the Middle Ages, with great education in mathematics, among them Descartes and Leibniz, recognize the great value of the machines for the progress and benefit of humanity.

It is well known that every new great discovery changes the conditions of life and opens new avenues of application. The automobiles require the construction of new and broader avenues. The development of transportation aided in the development of tourism. Money is moving with the same rhythm. In the disappearance of unemployment helped, unfortunately, the extended wars of the past years absorbing a large part of the unemployed manpower. There remains also a serious accusation against the perpetual discoveries and perfection of machines, which accusation today is directed especially against the chemists. Your discoveries, the accusers say, spread death and supply food to the wars! The accusation is not new. It is as old as war itself.

What good is bravery? cried Archidamus, the son of Agesilaus, when he saw the first catapult arriving from Sicily.

What would he say of the atomic bombs, the nuclear heads, the supersonic

aircraft, the suffocating gases, the detonating traps, the automatic weapons, the submarines, the mines, deadly pyrotechnics aiming to increase human misery and misfortune?

The invention of submarines was disapproved and renounced as a means of evil and destruction only. The ingenious engineer Leonardo da Vinci wrote in his notes: «Why do I not describe the way I know to stay under water as long as I can sustain hunger? If I do not make this known, it is only because I fear the evil of men, who would use this to commit murder in the deep sea, breaking up ships and sinking them and their crews». A sad prophecy, indeed! On the other hand, others were encouraging the perfecting of war machines, for by them the civilized man defends himself against the large mass of the uncivilized.

Aristotle replied as follows when asked his opinion about the new war machinery: «together with the walls, these are very often the last recourse of the brave against multitude». The destruction of feudal power was mainly due to the guns.

The great philosopher and mathematician Gottfried Wilhelm Leibniz (1646—1716), concerning the progress of mechanics and the invention of guns, says: «These I consider as gifts of the goodness of God rather than gifts of his wrath, since they helped in the restraint of the Ottoman torrent which threaten to flood all of Europe, and in these we base our hopes to lead out, one day part of our people from darkness and barbarity so that they, together with us, will enjoy the gladness of life and the knowledge of good, repaying to Greece, mother of sciences and to Asia, mother of religion, the goods which we owe them.

However, to attribute the evils of war to the engineers and chemists is like condemning the knife and not the murderer. We can murder with the hoe instead of cultivating the earth. We may poison with medicinal drugs instead of curing illnesses. We may use our education, through the power of our speech, to strengthen the good or the evil, as we wish.

It is not gunpowder or mustard gas, or atomic energy, or the other great inventions that kill, but the ancestral wild man who still resides in our souls.

The well known poet and humanist Francesco Petrarca (1304—1374) was angry at his contemporaries, because they used the discoveries, made for the defense of the freedom of the motherland, to destroy and enslave free people.

We do not, certainly, criticize Pasteur for his discovery of the bacteria, which saved and saves thousands and thousands of human beings, many more than wars kill, because by their cultivation they can bring to the enemy dreadful epidemics.

Alfred Nobel invented dynamite with which we opened tunnels in the Alps. Others used it for the extermination of human beings and Nobel, protesting the misuse of his invention, willed the large amounts of money that his invention brought him for the promotion of pure science.

To the sciences we have recourse, seeking the antidote, as soon as a new deathly weapon is invented. Science again finds new inventions neutralizing the evil use of its own discoveries.

Science arrays anti-aircraft missiles against the airplane rockets, bazookas against the tanks, the active carbon mask against the suffocating gases, etc.

It is often said that, the sciences that inspire the inventors, move us away from religion and bring us every day closer to materialism, slackening the moral bonds of the human race and hurting ideology.

With respect to the first argument, which is used often by amateurs in the science theologians or even scientists aiming at the creation of confusion in the two great but independent branches of our intellectual existence, we let

Francis Bacon answer. And this great philosopher and naturalist, whom we previously described briefly, replies : «Too little science moves God away, a lot of science brings him back».

We certainly, do not demand that the machine should replace the gospel, or that the scientist replace the preacher. A machine teaching piety or honesty will never be invented. The moral effect of the sciences is not realized by instruction or sermon ; it is invisible and acts deeper and unconsciously, upon man. It is not logical to demand from the applied sciences—for it is against them that the arrows are thrown—the development of which spans only two centuries, to eliminate all the criminal remnants, the atavistic traditions and hereditary effects installed into our subconscious.

Have philosophy and the abstract sciences, whose blooming began almost twenty five centuries ago, solved this problem ?

The applied sciences help us see things as they are, not as we wish them to be. Those who are trying to turn away their eyes from reality, the accusers of applied sciences, metaphysicists, sensualists or mysticists, creating narrow or pseudosensualistic intellect, end up as utopian idealists or visionaries offering no benefit to the human soul.

The common endeavor of the scientists for the discovery of truth, and the common joy of knowledge of the truth, create an ideological world among them, a respect for personal freedom and the desire to lead the world to higher ideals.

All these scientists are supporters of peace, working together like brothers in an international atmosphere free of animosities.

But the greater effect of science upon the elevation of man we shall find in the improvement of the conditions of life through its inventions.

The replacement of the human muscles with the piston of the engine, and this in turn with electrical and nuclear engines, reduced manual work and increased mental work.

Science tamed savage and uncivilized people, living as wild beasts, changed their deserts to farms with the machines, freed them from fatal epidemics, civilized and humanized them.

Through machines and chemical fertilizers it increased agricultural products and made accessible to the people goods which our great-grand fathers could see only on the tables of the wealthy.

Science discovered new unknown forces of Nature and put them in the service of humanity.

Thales' amber provides light, heat and motion to engines and thought.

The generation to which the author of this paper belongs saw Jules Verne's dreams (the speaker's pleasant childhood companion) become a reality.

The progress of the natural sciences enabled us to cross the skies with Icarus, to communicate with others at great distances through immaterial waves, to give life, voice and immortality to the shadows through the art of motion picture and write the history of our lives for our descendants.

We recall at will, through the radio and television, in the quietness of our office, the most famous singers musicians, and artists, the best orchestras, changing thus, as if by magic, the peasant's hut to a concert chamber and theatrical hall.

The transforming power of Chemistry we use to extract from the air, coal, water, or tar an inexhaustible multitude of colors, perfumes, plastic materials and every kind of substitutes.

We see, hear, learn and enjoy life with the fast rhythm which the new

ventions gave it and consequently we live much longer than our parents and ancestors. For life is measured not by the number of turns of the hour-hand of the clock but by the number of events we live through.

But are these benefits adequate to give science and its inventions a share in the moral uplift of man ?

Man, however, is grumbling by nature and must be, since this is exactly what progress demands. Consent to the present state but seek better things.

It is a fact that science gave us leisure, enriched our life, but some tell us that it did not bring yet the golden age but the age of gold. They say that science has not cleansed us, as yet, from the passions and hatred against our fellow men, feelings which at certain times change life-giving earth into a hell of fire and a banquet of vulture.

Erasmus once said that man behaves toward other men at times as God and at times as a wolf.

We must not forget that from the first two brothers who saw the light of the day, Cain killed kind Abel from malice and as a consequence we remain descendants of Cain.

With patience the wolf is tamed. Man tamed the bloodthirsty wildcat and brought it out of the wild beasts to tender embraces and caresses. But the tamed cat of the house, in the sight of a bird or snake, is enraged, remembering, after the lapse of innumerable generations, the wild and rapacious way by means of which its ancestors hunted their food.

If the mischievous cells which man inherited in his subconscious do not become degenerate by training and education, he will, often, remind us of Erasmus' man-wolf.

No one can possibly doubt that the more man is civilized and educates his mind through science, the more he has insights about himself and the faster he eliminates the unhealthy remnants of the life of the uneducated man.

The man who knows how to tame nature is superior to the man who submits to it passively, and moves gradually away from Erasmus' man-wolf and approaches closer to the man-God.

Very often we attribute our misfortune to the machine and the progress. But progress is like a torrent whose current no one can stop ; much less the fluid ink. «All men, by nature, desire knowledge», says Aristotle.

Science will thrive and the machine will be perfected and spread, whether we wish it or not. It is idle talk to discuss whether the spread of the machine is for the benefit or harm of humanity. We must take care so that, through national and social measures, we anticipate or confine the damages which its increasing spread could bring and multiply the benefits from it.

One day the golden age will come. But not the golden age of Hesiod, as a euphemism, when man was still fighting the beasts. Man does not fight any more the beasts, but he always fights his fellow-man. The golden age will come when these two dreadful enemies put down their arms ; when man will become reconciled with man.

Π Ε Ρ Ι Α Η Ψ Ι Σ

Αί ἐφηρμοσμένοι ἐπιστήμαι ὡς μέσον ἐξυψώσεως τοῦ ἀνθρώπου

Πολλοὶ καταφέρονται κατὰ τῶν ἐφηρμοσμένων ἐπιστημῶν σήμερα, ὡς ἐπιστημῶν ποῦ ὠθοῦν τὸν ἄνθρωπον πρὸς τὸν ἔλεθρον. Καὶ ὁμως, ὅταν μετὰ τὸν μεσαιῶνα αἱ ἐπιστήμαι αὐταὶ ἀνε-