# Ethics in Academia:
# Principles for Ethical Behavior
# in Advanced Studies and Research

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**INTRODUCTION**

A student embarking on graduate studies and on a research project, either at the Masters or the PhD level begins an exciting adventure that leads to "wonderland". A wonderland of ideas, of methods and techniques invented and used by people, driven by curiosity and spirit of innovation to learn about our world and to use the knowledge gained towards a variety of (hopefully worthy and positive) goals. Guided by teachers and advisors who have already ventured into this "wonderland" themselves, the student will proceed, at first with much hesitation then with more and more self-confidence. In graduate studies, the student is expected to reach unexplored frontiers of this "wonderland" and make original contributions to knowledge, develop new methods of investigation and make interesting discoveries, thereby adding to our understanding of the world and to the means available for exploiting this understanding for our benefit. The more we learn during these wanderings, the keener our understanding of the scientific discovery process, the better we grasp the ideas and inventions that people made to exploit "the known laws of nature", the more our appreciation for those who preceded us should grow. We are in a huge debt to those who contributed and contribute to this "pool of knowledge and know-how", and our behavior should always impeccably reflect the respect and the debt we owe them.

*"If I could see farther than others, it was because I stood on the shoulders of giants"*, Isaac Newton (1642-1727), a giant himself, supposedly said, paying tribute to his predecessors.

Ethics is a philosophical discipline that deals with rules of "correct", "good", "moral" human behavior. A person who feels the miracle of creation, who grasps the wonder of life on Earth, who looks at the night sky and realizes that we are all but a speck of insignificant dust in a gigantic universe, does not need to be told that life is precious and sacred and should be respected. A student who appreciates the wonders of science and technology, who understands what mankind has achieved through research and innovation should find the rules of ethics below as natural and as obvious as: *Love thy mother*! or, *Do not forget to breathe*! It is therefore quite surprising to realize that there are some among us, both older researchers and young students, who from time to time must be reminded of some of the obvious, elementary and reasonable rules of "correct" behavior.

**THE TEN COMMANDMENTS**

The best known rules for Ethical behavior, a set of ancient principles that may be regarded either as "divine commandments" of as "practical guidelines" for living in a human community are the biblical Ten Commandments, listed, for convenience, below:

1. *"I, the LORD, am your God, who brought you out of the land of Egypt, that place of slavery.*
2. *You shall not have other gods besides me. You shall not carve idols for yourselves in the shape of anything in the sky above or on the earth below or in the waters beneath the earth; you shall not bow down before them or worship them. For I, the LORD, your God, am a jealous God, inflicting punishment for their ancestors' wickedness on the children of those who hate me, down to the third and fourth generation; but bestowing mercy down to the thousandth generation, on the children of those who love me and keep my commandments.*
3. *You shall not take the name of the LORD, your God, in vain. For the LORD will not leave unpunished him who takes his name in vain.*
4. *Remember to keep holy the Sabbath day, six days you may labor and do all your work, but the seventh day is the Sabbath of the LORD, your God. No work may be done then either by you, or your son or daughter, or your male or female slave, or your beast, or by the alien who lives with you. In six days the LORD made the heavens and the earth, the sea and all that is in them; but on the seventh day he rested. That is why the LORD has blessed the Sabbath day and made it holy.*
5. *Honor your father and your mother, that you may have a long life in the land which the LORD, your God, is giving you.*
6. *You shall not kill.*
7. *You shall not commit adultery.*
8. *You shall not steal.*
9. *You shall not bear false witness against your neighbor.*
10. *You shall not covet your neighbor's house; you shall not covet your neighbor's wife nor his male or female salve, nor his ox or ass, not anything else that belongs to him."*

(The Holy Bible, Exodus, Chapter XX, Ca 1500 BC)

Sometimes these commandments are rephrased approximately as follows (see e.g., 10commands.bloyspot.com).

1. *"Acknowledge the existence of God*
2. *Love God, whom you image more than any "thing" in the universe.*
3. *Respect God's image in others, by avoiding the name of God in lying, cursing or justifying an injustice.*
4. *Give yourself adequate time for rest, community, and spirituality.*

5. *Respect your elders.*
6. *Respect human life.*
7. *Honor your commitments and your sexuality.*
8. *Be honest.*
9. *Respect the property of others.*
10. *Rejoice in the good fortune of others, do not envy them."*

In this rephrasing, the ancient commandments do look like quite natural and modern rules of behavior in a community. From these basic principles rules of behavior in all fields of endeavor indeed follow directly, however it will be helpful to spell them out for the framework of academic life.

In academia too, while engaged in our studies and research we are expected to behave honestly and fairly towards others. While this seems to be a simple-enough "meta-rule", one only has to read the history of science, or attend some meetings of a university disciplinary committee to realize how complicated and un-straightforward academic life too can become. People who would rather die than steal a chocolate bar in a supermarket readily appropriate someone else's idea in a scientific publication and feel no remorse at all ( and in many cases they even convince themselves that *they* came up with the idea first, or in parallel and independently!). A student who would make all the efforts to return a lost wallet loaded with money to its rightful owner may also think it is no big deal to collaborate with a colleague on an exam or to hand in a homework he copied from a friend. In the sequel I shall try to describe the activities at our University and spell out ten specific commandments for ethical behavior while engaged in research and studies at the Technion.

At the Technion researchers, teachers and students work in a wide variety of scientific and applications oriented, engineering and medical, disciplines. The philosopher John Locke (1632-1704), in his Essay Concerning Human Understanding, written in 1690, presented an outstanding classification of the activities we are engaged in, as follows:

1. *"Science may be divided into three sorts. All that can fall within the compass of human understanding, being either, First, the nature of things, as they are in themselves, their relations, and their manner of operation: or, Secondly, that which man himself ought to do, as a rational and voluntary agent, for the attainment of any end, especially happiness: or, Thirdly, the ways and means whereby the knowledge of both the one and the other of these is attained and communicated; I think science may be divided properly into these three sorts:-*
2. *Physica. First, The knowledge of things, as they are in their own proper beings, their constitution, properties, and operations; whereby I mean not only matter and body, but spirits also, which have their proper natures, constitutions, and operations, as well as bodies. This, in a little more enlarged sense of the word, I call Phusike, or natural philosophy. The end of this is bare speculative truth: and whatsoever can afford the mind of man any such, falls under this branch, whether it be God himself, angels, spirits, bodies; or any of their affections, as number, and figure, &c.*
3. *Practica. Secondly, Praktike, The skill of right applying our own powers and actions, for the attainment of things good and useful. The most considerable under this head is ethics, which is the seeking out those rules and measures of human actions, which lead to happiness, and the means to practise them. The end of this is not bare speculation and the knowledge of truth; but right, and a conduct suitable to it.*
4. *Semeiotike. Thirdly, the third branch may be called Semeiotike, or the doctrine of signs; the most usual whereof being words, it is aptly enough termed also Logike, logic: the business whereof is to consider the nature of signs, the mind makes use of for the understanding of things, or conveying its knowledge to others. For, since the things the mind contemplates are none of them, besides itself, present to the understanding, it is necessary that something else, as a sign or representation of the thing it considers, should be present to it: and these are ideas. And because the scene of ideas that makes one man's thoughts cannot be laid open to the immediate view of another, nor laid up anywhere but in the memory, a not very sure repository: therefore to communicate our thoughts to one another, as well as record them for our own use, signs of our ideas are also necessary: those which men have found most convenient, and therefore generally make use of, are articulate sounds. The consideration, then, of ideas and words as the great instruments of knowledge, makes no despicable part of their contemplation who would take a view of human knowledge in the whole extent of it. And perhaps if they were distinctly weighed, and duly*

*considered, they would afford us another sort of logic and critic, than what we have been hitherto acquainted with.*

5. *This is the first and most general division of the objects of our understanding. For a man can employ his thoughts about nothing, but either, the contemplation of things themselves, for the discovery of truth; or about the things in his own power, which are his own actions, for the attainment of his own ends; or the signs the mind makes use of both in the one and the other, and the right ordering of them, for its clearer information."*

(AN ESSAY CONCERNING HUMAN UNDERSTANDING, Chapter XXI Of the Division of the Sciences, John Locke, 1690)

Thus, according to Locke, researchers may be involved in attempts to uncover the secrets of Nature (via research in Physics, Chemistry, Biology) or in applying the acquired knowledge to our benefit (via innovations in Engineering or Medicine, and note that Ethics is considered by Locke to be a very practical and applied discipline devising *"rules and measures for human actions which lead to happiness, and the means to practice them!"*) or in the process of designing and using languages or systems of signs aimed at organizing and conveying to others the knowledge and know-how we have gained (via say Mathematics, Computers, Logic and even Literature and Art). In academic circles, professors and graduate students are engaged in basic scientific research and in technological innovation work and in teaching undergraduate students about the wonders of nature and technology. The activities of students and researchers involve complex social interactions, and their work is not at all easy. Indeed learning advanced topics and doing cutting-edge research can be very frustrating activities. However, the hard work is often amply rewarded by the wonderful personal feeling of achievement when a discovery is made, a new invention works or (even at the level of undergraduate studies) a topic is fully grasped and understood, and becomes a usable tool in future work and study. In this context of complex social interactions, obeying some basic rules of "good" or ethical behavior is essential, as one should *"not add to the misery and the sorrow of the world"* but enable all to *"smile to the infinite variety and mystery of it"* (in the words of the great American/Armenian writer William Saroyan (1908-1981)) .

## TEN COMMANDEMENTS FOR ETHICAL BEHAVIOR IN ADVANCED STUDIES AND RESEARCH

1. **ACKNOWLEDGE THE MYSTERY OF NATURE**

Our universe and our life hold mysteries that will remain beyond our capability to understand. Here it is appropriate to quote Albert Einstein (1879-1955):

*"The most beautiful experience we can have is the mysterious. It is the fundamental emotion which stands at the cradle of true art and true science. He to whom this emotion is stranger, who can no longer wonder and stand rapt in awe is as good as dead: his eyes are closed."*

Or in the words of Max Planck (1858-1947):

*"Science cannot solve the ultimate mystery of Nature. And it is because in the last analysis we ourselves are part of the mystery we are trying to solve".*

Indeed the more we think about it the more we realize that it is nothing less than a miracle that we can, in fact, "observe" and "describe" and "model" and hence "understand" certain aspects of our world with the help of some quite amazing tools we invented like telescopes and microscopes and particle accelerators and silicon chips, and computers and the language of mathematics. All this within a paradigm we call the scientific method, based on theories and models that yield "theoretical predictions" for future observations and measuring progress by invalidating our theories via experiments designed to test them. Therefore, we must be humble and grateful for what we can comprehend and achieve.

2. **UNDERSTAND THE FUNDAMENTAL LIMITATIONS, THE GOALS AND THE METHODS OF SCIENCE AND TECHNOLOGY**

Our aim is to unveil some of the secrets of nature ("the creation") and/or to use the known facts to innovate in technology and/or to develop better ways to describe and organize the acquired information. The process of acquiring knowledge about the workings of nature is a difficult and unending quest. In this process we should fully comprehend the established methods of investigation, the notion of truth in

science, the measures for progress in technology, the capabilities of our mathematical language and remain modest by understanding the fundamental limitations of our tools. The words of Moses Maimonides (1135-1204) written in 1190, wonderfully grasp the basic limitations under which we, as intelligent observers, work in the process of acquiring knowledge about the mysteries of an infinitely intricate universe:

*"There is a great difference between the knowledge which the producer of a thing possesses concerning it, and the knowledge which other persons possess concerning the same thing. Suppose a thing is produced in accordance with the knowledge of the producer, the producer was then guided by his knowledge in the act of producing the thing. Other people, however, who examine this work and acquire knowledge of the whole of it, depend for that knowledge on the work itself. E.g., an artisan makes a box in which weights move with the running of the water, and this indicate how many hours have passed of the day and of the night. The whole quantity of the water that is to run out, the different ways in which it runs, every thread that is drawn, and every little ball that descends – all this is fully perceived by him who makes the clock; and his knowledge is not the result of observing the movements as they are actually going on; but, on the contrary, the movements are produced in accordance with his knowledge. But another person who looks at that instrument will receive fresh knowledge at every movement he perceives; the longer he looks on, the more knowledge does he acquire; he will gradually increase his knowledge till he fully understands the machinery. If an infinite number of movements were assumed for this instrument, he would never be able to complete his knowledge"*

(M. Maimonides, The Guide for the Perplexed, Part III, chapter XXI, 1190).

Nature is infinitely intricate, hence we can never claim that our theories and models and devices are the "ultimate perfection", but rather continually subject them to critical, objective tests and judgments. The following paragraph, taken from a 1969 paper in Science by Mark Kac (1914-1984) nicely explains the role that models should have in our work:

*"Models are, for the most part, caricatures of reality, but if they are good, then, like good caricatures, they portray, though perhaps in distorted manner, some of the features of the real world. The main role of models is not so much to explain and to predict – though ultimately these are the main functions of science – as to polarize thinking and to pose sharp question. Above all, they are fun to invent and to play with, and they have a peculiar life of their own. The "survival of the fittest" applies to models even more than it does to living creatures. They should not, however, be allowed to multiply indiscriminately without real necessity or real purpose. Unless, of course, we all follow the dictum, attributed to Oswald Avery, that "you can blow all the bubbles you want to provided you are the one who pricks them.""*

(Mark Kac from "Some Mathematical Models in Science" Science, vol 166, no. 3906, Nov. 1969).

3. **DO NOT BE CYNICAL ABOUT RESEARCH AND BE AWARE OF "EXTERNAL FACTORS" THAT MIGHT INFLUENCE AND INTERFERE WITH YOUR JUDGEMENTS.**

Always be aware of the fact that "external" influences (like blind acceptance and belief in some theory or in somebody who has achieved the status of authority, or funding by a company with financial interests in the outcome of our work) can have a major effect on our work. Be sure to acknowledge the effect of such factors and take them into account when analyzing results and disclose them when reporting the findings. It is a good practice to always question authority, to reproduce and check the relevant work by others, and to use mathematical theorems only if you know how to prove them. It is said that while "unanswered questions" are the driving force of scientific and technological research, "unquestioned answers" are roadblocks to progress:

*"that splendid scientific cartoonist, Sidney Harris, has a lovely drawing showing the doorway of an unidentified research institute, and in front are two signs pointing opposite ways. One says "UNANSWERED QUESTIONS", the other,*

*"UNQUESTIONED ANSWERS". Sometimes, the most impressive advances come from questioning unquestioned answers."* (Robert W. Cahn).

Above all, never have a cynical attitude towards research. Research should be done with a clear scientific or technological goal in mind, not as a means for achieving "other things" like a degree, fame, money, impressing others etc.

*"One who studies widely and with set propose who questions earnestly, then thinks for himself about what he has heard, such a one will incidentally achieve Goodness"*

(Confucius (551-479 BC), The Analects, Book XIX,6)).

*"The Master said, in old days men studied for the sake of self-improvement; nowadays men study to impress other people"*

(Confucius, The Analects, Book XIV, 25).

The cynical attitude towards research is well manifested in the following popular joke:

*"Grad student 1 - What are you working on?*

*Grad student 2 – On a robot that will bring you a cup of tea.*

*Grad student 1 – Can your robot do that?*

*Grad student 2 – No!*

*Grad student 1 – What can it bring you, then?*

*Grad student 2 – A PhD degree."*

4. **PAUSE FROM TIME TO TIME TO QUESTION THE DIRECTION OF YOUR WORK, TO LOOK AT IT FROM DIFFERENT PERSPECTIVES AND TO LEARN ABOUT A DIFFERENT AREA OF RESEARCH.**

It is very important to realize that, in spite of the fact that we live in a time of overspecialization, some of the best results are obtained when we step back and look at our work from as many angles as our background knowledge and our tools allow us to do. Interdisciplinarity became such a fashionable buzzword nowadays precisely as a reaction to the trend of overspecialization. The ideal, renaissance

scholar who knows everything cannot exist today, but it always is beneficial to raise our head from time to time and see our work as it fits into the bigger picture. In the words of Santiago Ramon y Cajal (1852-1934):

*"If a supreme intelligence knew all the mysterious explanations linking all phenomena in the universe, there would be one single science instead of many different sciences. The frontiers that appear to separate fields of learning, the formal scaffolding of our classification scheme, the artificial division of things to please our intellects – which can only view reality in stages and by facets – would disappear completely in the eyes of such an individual. Total science would appear as a giant tree, whose branches represent the individual sciences and whose trunk represents the principle or principles upon which they are founded. The specialist works like a caterpillar perched on a leaf, cherishing the illusion that his little world flutters isolated in space. Endowed with a philosophic sense, the generalist sees – however imperfectly – the stem that is common to many branches. But only the genius alluded to above would enjoy the good fortune and power to see the entire tree, science, unitary despite its many specializations.*

***The need for specialization***

*It is wise, however, not to emphasize the unifying principle just discussed. It is too easy to run aground on the shoal of encyclopedic learning, where minds incapable of orderliness – who are restless, undisciplined, and unable to concentrate attention on a single idea for any length of time – tend to stop. Rotating inclinations, as a highly original physician-writer has called them, may create great writers, delightful conversationalists, and illustrious orators, but rarely scientific discoveries. The well-known proverb, "Knowledge does not occupy space," is a grave mistake. Fortunately, this is of little practical consequence because even those who believe it must confess that learning many things at the very least takes time. Only an excessively flattering estimate of one's talents can explain the encyclopedic mania. The intent to master a number of sciences is a chimerical aspiration. Just consider the indefatigable men of real genius who resign themselves to a profound knowledge of one branch of knowledge – and*

*often to one concrete theme within a given science – only to harvest a small number of facts.*

*In short, do not get carried away by illusions. If a lifetime is needed to learn something about all of the human arts, it is barely sufficient to master completely, down to the last detail any one or two of them.*

*Modern encyclopedists such as Herbert Spence, Mack, and Wundt are actually specialists in the philosophy of the sciences and arts, as were Leibnitz and Descartes in their own time. However, the latter were able to dominate larger territory, and make discoveries in two or three sciences because less was known during their lifetime.*

*Multifaceted investigators have disappeared, perhaps forever. It is important to realize that today, in physics as in mathematics, in chemistry as in biology discoveries are made under the astute direction of specialists. However, they do not focus exclusively on a narrow topic; instead, they follow attentively the latest developments in related sciences, without losing sight of their specialty".*

(Santiago Ramon y Cajal, Advice for a Young Investigator, Chapter 4, pp 55-57, MIT Press, 1989)

*We make no apologies for making these excursions into other fields, because the separation of fields, as we have emphasized, is merely a human convenience, and an unnatural thing. Nature is not interested in our separations, and many of the interesting phenomena bridge the gap between fields.*

(Feynman's Lectures on Physics, Volume 1, Chapter 35)

Also, do not take yourself too seriously. As you pause and look at your work from different perspectives, you may even try to do something that seems nonsense, following the advice of the great physicist J.C.Maxwell (1831-1879), in the poem below:

*"At quite uncertain times and places,*
*The atoms left their heavenly path,*
*And by fortuitous embraces,*
*Engendered all that being hath.*
*And though they seem to cling together,*
*And form "associations" here,*
*Yet, soon or late, they burst their tether,*
*And through the depths of space career.*

*So we who sat, oppressed with science,*
*As British asses, wise and grave,*
*Are now transformed to wild Red Lions,*
*As round our prey we ramp and rave.*
*Thus, by a swift metamorphosis,*
*Wisdom turns wit, and science joke,*
*Nonsense is incense to our noses,*
*For when Red Lions speak, they smoke.*

*Hail, Nonsense! dry nurse of Red Lions,*
*From thee the wise their wisdom learn,*
*From thee they cull those truths of science,*
*Which into thee again they turn.*
*What combinations of ideas,*
*Nonsense alone can wisely form!*
*What sage has half the power that she has,*
*To take the towers of Truth by storm?*

*Yield, then, ye rules of rigid reason!*
*Dissolve, thou too, too solid sense!*
*Melt into nonsense for a season,*
*Then in some nobler form condense.*
*Soon, all too soon, the chilly morning,*
*This flow of soul will crystallize,*
*Then those who Nonsense now are scorning,*
*May learn, too late, where wisdom lies".*

(James Clerk Maxwell, Molecular Evolution, 1874)

5. **RESPECT THOSE WHO PRECEDED YOU, LEARN THEIR WORK THOROGHLY BUT ALWAYS EVALUATE IT CRITICALLY**

In our research we necessarily build on the achievements of our forerunners and our teachers. However, *"a good teacher protects his pupils from his own influence",* (as Bruce Lee said). Richard Feynman (1918-1988) points out in an essay entitled "What is science" that:

*"it is necessary to teach both to accept and to reject the past with a kind of balance that takes considerable skill. Science alone of all the subjects contains within itself the lesson of the danger of belief in the infallibility of the greatest teachers of the preceding generation"*

(R. P. Feynman on What is Science, in "The Pleasure of Finding Things Out", Penguin Books, 2001).

6. **ASSUME FULL RESPONSIBILITY FOR THE EFFECTS AND CONSEQUENCES OF YOUR WORK**

Keeping in mind the fact that our work may have bad consequences in addition to the good ones intended is part of our permanent responsibilities as researchers. The development of atomic energy, of the internet and the more recent amazing progress in biotechnology, in cloning and screening for the possible presence of disease-genes raise very difficult ethical questions pertaining to the issue of responsibility. A big question that will probably remain forever unanswered is: should a scientist or an engineer refrain from working on a topic, if he/she can foresee some "bad" application of his work?

In any case, it is a permanent responsibility to warn society about the possible bad consequences their scientific and technological work may have. In fact, since scientists and engineers work on the mysteries and wonders of nature, they should be more sensitive than others to the harm that mankind can bring upon our environment and to life on earth. Leonardo DaVinci (1452-1519) put it as follows:

*"and you, O Man, who will discern in this work of mine the wonderful works of Nature, if you think it would be a criminal thing to destroy it, reflect how much more criminal it is to take the life of a man; and if this, his external form, appears to thee marvelously constructed, remember that it is nothing compared to the soul that dwells in that structure; for that indeed, be it what it may, is a thing divine. Leave it then to dwell in His work at His good will and pleasure, and let not your rage or malice destroy a life – for indeed, he who does not value it, does not himself deserve it"*

(from The Notebooks of Leornardo DaVinci, Philosophical MAXIMS, 1140, Dover edition, vol II, 1970).

## 7. COLLABORATE FAIRLY

The progress of science and technology is a result of either explicit or implicit team work. Even the "lone scientists" who make important discoveries in their attic in fact participate in a community effort, they *"stands on the shoulders"* of their predecessors and their work will eventually be critically scrutinized by others. In this collaborative process, it is important for us to understand the importance of sharing information fully and accurately, and to encourage others to join our efforts. This can be done only in an atmosphere of mutual trust and openness. Hence one must always allocate credit fairly to all members of the group and the community at large.

- Never maliciously discredit or misrepresent other people's work, report their work accurately and fairly (one is, of course, free to openly criticize other work with well founded argumentation).
- Never use your position and/or seniority to exploit those whose careers depend on you.
- Never take credit for other people's work. Do not sign a paper unless you truly contributed to it and are ready to take full responsibility for all its content.

- Respect the young, encourage their enthusiasm and pay careful attention to their contributions.

*"The Master said, Respect the young. How do you know that they will not one day be all that you are now? But if a man reached forty or fifty and nothing has been heard of him, then I grant that there is no need to respect him".*

(Confucius – The Analects – Book IX, 22)

## 8. NEVER PLAGIARIZE

Plagiarism is the ugliest form of stealing, especially since it involves theft of ideas and words not some replaceable "material property". Professor H.C. Martin of Harvard defines plagiarism as follows:

*"The academic counterpart of the bank embezzler and of the manufacturer who mislabels his product is the plagiarist, the student or scholar who leads his reader to believe that what he is reading is the original work of the writer when it is not. If it could be assumed that the distinction between plagiarism and honest use of sources is perfectly clear in everyone's mind, there would be no need of the explanation which follows; merely the warning with which this definition concludes would be enough. But it is apparent that sometimes men of good will draw the suspicion of guilt upon themselves (and, indeed, are guilty simply because they are not aware of the illegitimacy of certain kinds of "borrowing" and of the procedures for correct identification of materials other than those gained through independent research and reflection).*

*The spectrum is a wide one. At one end there is word-for-word copying of another's writing without enclosing the copied passage in quotation marks and identifying it in a footnote, both of which are if necessary (This includes, of course, the copying of all or any part of another student's paper). It hardly seems possible that anyone of college age or more could do that without clear intent to deceive. At the other end there is the almost casual slipping in of a particularly apt term which one has come across in reading and which so admirably expresses one's opinion that one is tempted to make it personal property. Between these poles there are degrees and degrees, but they may be roughly placed in two groups. Close to outright and blatant deceit – but*

*more the result, perhaps, of laziness than of bad intent – is the parching together of random jottings made in the course of reading, generally without careful identification of their source, and then woven into the text, so that the result is a mosaic of other people's ideas and words, the writer's sole contribution being the cement to hold the pieces together. Indicative of more effort and, for that reason, somewhat closer to honestly, though still dishonest, is the paraphrase, an abbreviated (and often skillfully prepared) restatement of someone else's analysis or conclusion without acknowledgment that another person's text has been the basis for the recapitulation".*

(From *The Logic and Rhetoric of Exposition*, by Harold C. Martin. Holt, Rinehart and Winston Inc ., 1958).

In the age of the internet, plagiarizing is made easy for those of bad intent. It is a trivial matter to lift a phrase, a paragraph, a graph or an image from a web-page and "paste" it into your report, presentation or paper. We must always remember to respect the materials published on the Internet, their status being exactly like work that was published elsewhere. When we quote someone we have to use quotation marks and clearly give credit to the source. Our sages were fully aware of the importance of proper credit to the originators of an idea or a well formulated phrase:

"האומר דבר בשם אומרו מביא גאולה לעולם..." [מסכת אבות, ו',ו']

*("Quoting a concept in the name of its author brings redemption to the world"*. Or: *Whoever reports a saying in the name of the one who said it redeems the world"*.)

Tom Lehrer, (1928- ) a mathematician-musician wrote a very funny song describing the bad habit of plagiarizing (in mathematics). Some words from this song:

*"The secret of success in mathematics:*
*Plagiarize:*
*Plagiarize,*
*Let not one else's work evade your eyes.*

*Remember why the good Lord made your eyes.*
*So don't shade your eyes,*
*But plagiarize, plagiarize, plagiarize –*
*Only be sure always to call it please 'research".*

(Tom Lehrer, Lobachevsky, from "Too Many Songs by Tom Lehrer with Not Enough Drawings by Ronald Searle", Pantheon Books, New York, 1981)

## 9. BE HONEST IN PRESENTING YOUR AND OTHER PEOPLE'S RESEARCH WORK

Report your results fully and strive to make yourself as clear and understandable as possible in your talks, papers and reports, so that your peers will be able to reproduce your experiments understand your notations, assumptions, claims and follow your line of reasoning with no difficulty. Always follow Einstein's advice and try to *"make things as simple as possible, but not simpler"*.

Never ever falsify data, fabricate experimental results, select data to fit your theories or hide a flaw you are aware of in your argumentation. In short, never misrepresent your work and results. Also never discredit or misrepresent other people's work. Make sure you understand fully their results and contributions. Report others' results and achievements honestly, as you would like to see them reporting your own work. Be fair and honest when criticizing other people's work. Be generous:

*"The Master said the gentleman calls attention to the good points in others; he does not call attention to their defects. The small man does just the reverse of this"*

(Confucius, The Analects, Book XII, 16).

10. **REJOICE IN THE SUCCESS OF YOUR COLLEAGUES. DO NOT COVET GLORY, PRIZES AND SUCCESSES.**

Do not expect honor and recognition and prizes and fame for you work in research. Let always the work itself, your steady and genuine interest in it be its own reward. The best recognition a scientist or an engineer can have is the respect of the peers and the credit that they give his/her work. Envy often leads to plagiarism and dishonest behaviors as described by Maimonides:

*"For when we like a certain perfection, find pleasure in it, and wish to possess it, we sometimes desire to make others believe that we possess that virtue, although we are fully aware that we do not possess it. Thus people, e.g., adorn themselves with the poems of others, and publish them as their own productions. It also occurs in the works of wise men on the various branches of Science, that an ambitious, lazy person sees an opinion expressed by another person, appropriates it, and boasts that he himself originated it.*"

(M. Maimonides, The Guide for the Perplexed, 1956 Part II Chapter XL).

However, one may positively channel the "good envy", in the sense of admiration for someone's work, by using it as a catalizer and a driving force for one's own work:

"קנאת סופרים תרבה חכמה" (**בבא בתרא כא ע"א**).

Do not work for prizes and recognition. Be aware that often recognition comes a long time after the author of a work ceased to exist. Also be aware that praise and prizes for your work can corrupt you:

*"The only way to escape the personal corruption of praise is to go on working. One is tempted to stop and listen to it. The only thing to do is to turn away and to go on working. Work. There is nothing else!"*

(Einstein, 1879-1955).

And here is what Feynman said about his Nobel Prize:

*"I don't' see that it makes any point that someone in the Swedish Academy decides that this work is noble enough to receive a prize. I've already got the prize. The prize is the pleasure of finding things out, the kick of discovery, the observation that other people use my work – those are the real things, the honors are unreal to me"*

(Feynman," The Pleasure of Finding Things Out", Penguin Book, NY 2001).

*"The Master said, the good man does not grieve that other people do not recognize his merits. His only anxiety is lest he should fail to recognize theirs"*

(Confucius, The Analects, 2001,Book I, 16).

**CONCLUSION**

To conclude, we are bringing the Code of Ethics of the Israeli National Council [INC] of Research written by a professional team led by Prof. Asa Kasher, The Hebrew translation of this Code appears in the Technion catalogue for undergraduate and graduate students.

# Statement and Code of Ethics of Israel's National Council for Research and Development

## The Ethics of Scientific Research: Values and Principles

**January 1998**

### Introduction

The National Council for Research and Development is appointed by the government and operates through its plenum and committees, one of which is the Committee for Ethics in Science and Intellectual Property.

The Committee for Ethics in Science and Intellectual Property has decided to take a number of steps in order to raise the awareness of members of the scientific research community - both researchers and students - regarding questions of ethics in scientific research. The intention of the Committee is to bring the level of awareness as to the importance of engaging in research ethics, and the level of professionalism in doing so, to international standards prevalent in the United States and a number of European countries. The Committee decided, at the first stage, to disseminate throughout the scientific research community, a document manifesting the values and principles of scientific research. A draft was prepared and distributed, commented on and improved. The revised version is now being distributed to all institutions engaged in scientific research and higher education in Israel.

At the second stage, the Committee intends to provide these bodies with teaching aids, to include both general and modular elements, suitable to the various fields of research. At the third stage the Committee will offer general guidelines for the establishment and maintenance of professional bodies within each of the institutions engaged in scientific research or education, both to foster ethics and to investigate allegations of ethical misconduct. In this, Israel lags significantly behind the United States, and in the Committee's opinion, steps should be taken to narrow this gap, in a prudent and gradual fashion.

The pursuit of ethics in scientific research and other professional fields, fundamentally entails fostering understanding of ethical values and principles, both for their own sake, and in order to increase their practical application. The investigation of misconduct is unavoidable, but should never be considered the foremost concern in the field of professional ethics.

The Committee for Ethics in Science and Intellectual Property will also welcome any comments on "The Ethics of Scientific Research: Values and Principles", as well as inquiries regarding all aspects of its work. The Committee will bring all comments to discussion, and will endeavour to take them into consideration.

(Address: The Committee for Ethics in Science and Intellectual Property, c/o Professor Asa Kasher, The Laura Schwarz-Kipp Chair in Professional Ethics and Philosophy of Practice, Tel-Aviv University, Ramat Aviv, Tel-Aviv 69978.)

## The Ethics of Scientific Research: Values and Principles

### 1. Truth

1.1 The scientist is concerned with the expansion of human knowledge of the world, the deepening of human understanding of its aspects, and the enhancement of human ability to exploit this knowledge for the achievement of goals vital to humanity, or having social merit.

1.2 The scientist serves these goals, in every branch of science, by acting in accordance with the methods of scientific research in each branch, and the rules of conduct in the scientific community in general.

### 2. Freedom

2.1 The scientist serves the goals of scientific research, based on the principle of scientific research freedom, which is one of the most prominent expressions of the democratic system.

2.2 The scientist undertakes the obligation to comply with practical restrictions imposed upon freedom of scientific research by the principles of the democratic system, for the adequate safeguarding of human life, welfare, dignity and liberty.

2.3 The scientist in willing to undertake the obligation to comply with practical restrictions in the areas of development and application, to the extent that these are required by social or economic considerations, in keeping with the principles of the democratic system.

### 3. Responsibility

3.1 The scientist bears full responsibility for every scientific research or experiment he or she conducts, particularly with regard to its direct effect on human lives and on human physical and mental health, welfare, dignity and liberty.

3.2 The scientist bears special responsibility for such direct effects upon those participating as patients or subjects, in scientific research or experimentation. The principles of the Helsinki Declaration regarding clinical experiments upon humans determine the scientist's threshold of responsibility, and it was in the spirit of these principles that the threshold of responsibility in non-clinical human experimentation was established.

3.3 The scientist pays real heed to considerations regarding the very need to use animals in planned or conducted research and experimentation, and to considerations regarding the lives and welfare of the animals being used, particularly with regard to minimising the suffering that may be inflicted upon them during the course of the experiment or thereafter.

3.4 The scientist acts out of a sense of responsibility, on grounds of which they constantly take into account in the knowledge that the results of his or her research may be used to attain goals within a wide range, from the beneficial to humanity to the criminal and abhorrent.

**4. Integrity**

4.1 The scientist performs every scientific act in accordance with all of the requirements of the scientific method within the framework of which he or she works, and at the highest standards

4.2 The scientist analyses data and generalizations, experiments and theories, whether his or her own or another's, equitably, and with the requisite scope, depth and precision.

4.3 The scientist presents his or her data in full, precisely, frankly and fairly.

**5. Collaboration**

5.1 The scientist acts within a universal framework of scientific collaboration, based on the shared scientific goals.

5.2 The scientist fosters scientific collaboration by maintaining an atmosphere of openness, mutual assistance and trust among scientists, their assistants and students.

5.3 The scientist merits individual, collective and institutional credit and may possess pursuant rights to intellectual property for scientific achievements to which he or she has made a unique or significant contribution,

**6. Professionalism**

6.1 The scientist engages in his or her scientific pursuits in a wholly professional manner, making judicious and continual use of the special knowledge, particular to his or her area of expertise.

6.2 The scientist strives to keep abreast of developments in his or her area of expertise and in every area of knowledge pertinent to his or her work.

6.3 The scientist draws practical conclusions in the field of ethics of scientific research from the values and principles of scientific research.

6.4 The scientist imparts the values and principles of scientific research to all those conducting research or experimentation under his or her supervision, particularly to students in every course of study serving to prepare them for professional activity within the scientific research community.