THE STRUCTURE OF SCIENTIFIC COMMUNITY AND ITS RELEVANCE TO SCIENCE ETHICS

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

ECE ÖZGE ÖZDEMİR

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF ARTS

IN

THE DEPARTMENT OF PHILOSOPHY

APRIL 2006

Approval of the Graduate School of Social Science

_____

Prof. Dr. Sencer AYATA
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Arts.

_____

Prof. Dr. Ahmet İNAM
Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Arts.

_____

Assoc. Prof. Dr. Ayhan SOL
Supervisor

Examining Committee Members:

Assoc. Prof. Dr. Ayhan SOL (METU, PHIL) _____

Assoc. Prof. Dr. David GRÜNBERG (METU, PHIL) _____

Assoc. Prof. Dr. Erdal CENGİZ (ANKARA, PHIL) _____

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last Name: ECE ÖZGE ÖZDEMİR

Signature:

ABSTRACT

THE STRUCTURE OF SCIENTIFIC COMMUNITY AND ITS RELEVANCE TO SCIENCE ETHICS

ÖZDEMİR, Ece Özge

M. A., Department of Philosophy

Supervisor: Assoc. Prof. Dr. Ayhan SOL

April 2006, 44 pages

The goal of this thesis is to argue that science is not value free on the grounds of a community based account of ethics. It is the peculiar feature of this model that ethics is a limitation on individual's freedom of action, and moral norms of a community reflect the structure of the community. I endeavor to resolve the problem, on an assumption that science is an activity of scientific community, that science ethics can be derived from the internal structure of scientific community. Therefore, this thesis attempts to show the relationship between scientific community and science ethics.

Keywords: Science, Scientific Community, Scientific Freedom, Ethics, Altruism

ÖZ

BİLİM TOPLULUĞUNUN YAPISI VE BİLİM ETİĞİ İLE İLİNTİSİ

ÖZDEMİR, Ece Özge
Yüksek Lisans, Felsefe Bölümü
Tez Yöneticisi: Doç. Dr. Ayhan SOL
Nisan 2006, 44 sayfa

Bu tezin amacı etiğin toplum dayanaklı açıklamasından yola çıkarak bilimin değerler üstü bir yapıda olmadığını göstermektir. Bu modelin ayırt edici özelliği, etiğin bireylerin hareket özgürlüğü üzerindeki kısıtlamalar olması ve toplumun moral normlarının toplumun yapısını yansıtmasıdır. Bilimin bilim topluluğunun etkinliği olduğu varsayımından hareket ederek, bilim etiğinin bilim topluluğunun iç yapısından çıkartılabileceği problemini çözmeye çalıştım. Bundan dolayı, bu tez bilim topluluğu ve bilim etiği arasındaki ilişkiyi göstermeye çalışmaktadır.

Anahtar Kelimeler: Bilim, Bilim Topluluğu, Bilimsel Özgürlük, Etik, Özgecilik

To My Parents

ACKNOWLEDGMENTS

I would like to express my heartfelt thanks to my supervisor, Assoc. Prof. Dr. Ayhan Sol for his guidance, insight and valuable criticism throughout the research. I would also like to thank other jury members, Assoc. Prof. Dr. David Grünberg and Assoc. Prof. Dr. Erdal Cengiz for their helpful suggestions and comments.

Moreover, I am indebted to my parents for all their encouragement and great support.

TABLE OF CONTENTS

CHAPTER I

INTRODUCTION

This thesis has several goals some of which may seem to be too ambitious to be realized within the scope of a master's thesis. The motivation behind these goals, the ambitious as well as the modest ones, was this all too known question: Is science value free? The traditional answer that is probably held by the majority of scientists even today is affirmative. Those who believe that science is value free use it as a justification for an unlimited freedom of scientific research that is necessary for the progress of science. I argue that scientific freedom as well as science ethics in general should be examined in relation to scientific community. Hence I defend the idea that scientific freedom can and should be restricted so far as scientific progress is valued. In other words, the limitation of scientific freedom can be defended (surprisingly even to the satisfaction of those who value the unlimited freedom of science the most) for the sake of science and scientific progress, for the norms of science ethics guarantee the sustainability of science and scientific progress.

In order to understand what ethics is, I start in Chapter II with a Darwinian notion that ethics means limitation, a limitation on freedom in the struggle of existence. This core idea that I defend throughout this thesis was used by Aldo Leopold in his seminal theory of the Land Ethic (which has later been further developed by J. Baird Callicott). Leopold argued that the moral norms of a community reflect the structure of the community. In other words, ethics and community are correlative. From this it seems to follow that change in community results in change in moral of the community. Furthermore, from the Darwinian point of view, we have become social beings, thus moral beings as well, in the struggle for existence. In this sense, ethics seems to be a matter of social necessities.

In Chapter III, on the basis of this bio-ecological model, I argue, on a further assumption that science is an activity of scientific community, that science ethics can be derived from the internal structure of scientific community (that is, the interdependence relations among the members of scientific community). However, since I admit that scientific activity is possible by semi-isolated individuals I give a brief description of the historical development the scientific community. This brief history seems to suggest that internal limitations on scientists arised as an inevitable necessity (that was not possible when science was a semi-isolated activity) when the scientific communities, and eventually a universal scientific community, have formed.

I identify the internal structure and dynamics of scientific community with modes of competition, cooperation, interaction, competence, solidarity among individual scientists and integrity and stability of the scientific community. I argue that science ethics is the guarantee for the preservation of these features. The norms of science ethics that arise from the internal structure of the scientific community may be identified as willingness to criticism, to not fudge scientific data, to not mislead, plagiarise, hide the source of citations and willingness to give a complete, right and full report of references etc. I assert that without internal limitations on scientists, scientific community will degenerate, and in due course scientific activity will not continue and scientific progress will come to a halt.

I also argue that since scientists are members of other communities they are under external limitations as well as internal limitations. The external limitations also arise from the interdependence relations between scientific community and the other communities it intersects.

I further maintain that although internal limitations always have positive effect on scientific activities, external norms may limit scientific community in positive or negative ways. I also emphasize internal norms of science do not have priority over external norms, unless we value science more than anything else.

CHAPTER II

RELATIONSHIP BETWEEN COMMUNITY AND ETHICS

In this section, I analyze the conceptual and theoretical foundations of the community concept since it plays a crucial role in the understanding of ethics in this thesis.

In the history of Western ethics, reference to the connection between community and ethics goes as far back as Plato who argued that man must live in a community and the sustainability of a community requires morality. For instance in *Republic* Plato says, "a band of robbers and thieves, or any other gang of evildoers could [not] act at all if they injured one another" (p. 351c).

The concept of community is derived from the root "common" implying that certain things are shared. As for organisms, community might mean a group of organisms, which may or may not be genetically related, sharing an environment, such as a number of organisms existing in a geometrically or geographically defined surrounding. I think geometrical, geographical, or even causal-physical considerations have a secondary role in the notion of community for living beings, because organisms do not only exist in a common environment but are also more intimately related to their environment and to each other. They compete (and may also cooperate) with each other in order to survive and reproduce against background environmental conditions. (I should emphasize that organisms are also part of the environment against which they compete with each other.) Biologically speaking, a more common use relevant to the association of organisms is *population*. The notion of *community* is more of an ecological concept and may also be used in relation to both human and non-human populations on the condition that there are other stronger bonds that hold individuals in a population, such as integrity, stability, responsibility, common purpose, membership, and so on. It appears that, some of these notions, such as responsibility and common purpose, can only be used in relation to human communities. (However, I think the notion of common purpose defined as an evolutionary purpose *may* be attributed to non-

human communities.) These notions that can be used to distinguish the concept of human communities from non-human communities seem to require consciousness or even higher cognitive abilities, such as rationality. Accordingly, it seems plausible to argue that the members of a human community must willingly share general ends and especially values which they strongly appreciate as *common ends* and *values*. We would be mistaken if *common ends* are confused with *private ends*.

This description of community may be charged as anti-individualist because of the emphasis on common factors. I do not intend to underestimate the value of autonomy, and having different choices, approaches, beliefs etc. On the other hand, in this thesis, since the concept of ethics is a community-based notion, it does not overlap with the ethical view of individualism. According to some of the individualist view of ethics, every person has an intuitive basis for moral sense. In other words, individualist view of ethics claims that morals are rooted in our intuitions. I agree that there may be an "intuitive" basis for moral sense, but I think this intuition should be naturalized. Hence I argue throughout this thesis that this intuition should be replaced by "moral instinct" that has been formed by evolutionary process and is also the basis of our social nature. I will examine it later with references to Darwin's evolutionary ethics.

As stated by individualistic ethics, moral duties originate from neither society nor any other institution but from the individual. Moreover, the highest aim of moral action is the personal development. Let me give an example to scrutinize the validity of the individualistic approach. In Plato's example of "a band of robbers," robbing is an unethical activity and the principle "do not rob" is a moral duty. Nevertheless a criminal robs or kills innocent people without any regret, lacking in obedience to this moral principle. The common point of a gang of robbers is robbing *others* but *not* robbing or killing the members of their community. So when the same robber is obedient to such moral duties in a gang of robbers rather than any other communities there does not seem to arise any contradiction. However the principles, "do not rob" or "do not kill" are moral duties both as regards the public at large and in the gang of robbers. "[U]se of

moral principles is a matter of social practice irreducible to the conscious action of individuals" (Bhargava, 1988).

In this context, the individualist view of ethics would lead us to a conflict. The individualist ethicist would say that moral duties originate from the individual not from external limitations. But I assert that social interactions play a crucial role in building moral norms. Thus, individualist view of ethics is in conflict with the explanation for the use of ethics in this thesis. Let me now describe the theoretical foundations of my community-based ethical view.

I agree with Leopold (1970) that ethics is no more than a limitation on individuals' freedom of action which is an inevitable result of socializing and living in a community. So ethics is connected with our social "nature." (But I should emphasize that the conditions for behaving and thinking individualistically and behaving as a member of a community may be different from each other, in terms of the motives of the individual. The individual may be motivated to live in a community simply by her own self(ish) interests or genuine alturistic sentiments. But of course by its consequences we may not always be able to distinguish the former (the selfish behavior) from the latter (the altruistic behavior) if both behavior contribute to the sustainability of the community.) For example; as Allen Buchanan says; "in the activities that are the life of the community, individuals think of themselves first and foremost as members of the group" (Buchanan, 1998).

There is no mistake in justifying our inclination for socializing, and being a member of a community could arise either from deliberate and rational reasons or just from social instincts, i.e. the need for sociability. I assume that both community and ethics—that seem to have arisen from the necessities of social life—are instinctive institutions. Thus there is no contradiction about expressing "*partnership*" or associations as communities which are developed deliberately and rationally for the mutual benefit of its members.

While accepting the idea that ethics is a matter of social necessities and so a result of social instincts, in Western philosophy almost all philosophers accept that ethics is related with reason. So this claim may sound too eccentric or extreme. Leopold's notion of ethics and its relation with community, at least as developed

by J. Baird Callicott, is also a community-based ethics which is, however, proposed in relation to the environment as a whole. Callicott characterizes this fault (that is, starting morality with reason) as "*putting the cart before the horse,*" a reverse process of reasoning. (Callicott, 1989, p. 78) Callicott also attempted to explain the origin of reason in terms of evolution and socialization:

> Reason appears to be a delicate, variable, and recently emerged faculty. It cannot, under any circumstances, be supposed to have evolved in the absence of complex linguistic capabilities which depend, in turn, for their evolution upon a highly developed social matrix. But we cannot have become social beings unless we assumed limitations on freedom of action in the struggle for existence. Hence we must have become rational. (Callicott, 1989, pp. 78-9)

If we follow Callicott's thoughts in this paragraph, we can conclude that, ethics is a pre-rational activity, thus it has to be an instinctive behaviour. The same is true of Leopold's view. In his words: "Ethics are possibly a kind of community instinct in the-making" (Leopold, 1970, p.239). A similar view is also found in Darwin's reflections in the "The Descent of Man" where he argues that ethics is a kind of social instinct. (Darwin, 1998, p. 123)

There may arise an important question here. How did it happen that such a restriction (i.e. morality/altruism) on our freedom of action could have evolved and become inherited by every descendant while appearing as a "burden" in the struggle for existence? Indeed as explained by Nicholas Humphrey; the cost of self-denying, altruistic behaviour gets repaid to the altruist himself, both in the short and long term. (Humphrey, 1997, p.204)

Now I shall examine this principle in some depth with the help of an example. If a person makes a sacrifice for the well-being and survival of his/her family members, it is rather easy to argue that such ethical/altruistic behaviour evolutionally serves for the fitness of the person in question, since fitness is

measured by reproductive success. Since this behavior results in reproductive benefit of the individual, it is called biological altruism, as distinguished from vernacular altruism. Of course, I should mention that although this behavior increases the reproductive success of the one who makes the sacrifice and also appears to be selfish by its benefit to this sacrificing individual it is altruistic because it also benefits others, in our case her relatives, judged by its consequences. Some sociobiologists and philosophers name it "kin altruism." It is important to remember that biological or evolutionary altruism does not include intentional behaviour (except the behaviors of humans and other intentional animals). "[H]uman altruism [on the other hand] requires a psychological factor, an intention to do something for someone. Biological altruism does not" (Ruse, 1998, p. 446). Reproductive success is the direct benefit that the altruistic subject earns. And whatever the altruist gains from biologically altruistic behaviour further is subsidiary.

Let us evaluate the matter from the other side now: since friends do not carry the same genes what is the point of restricting or sacrificing oneself for the well-being of a friend? The main characteristic of human altruism is *sympathizing with "others" and aiming to do something voluntarily for others* that come from emotional factors. I suggest that human altruism is one of the key mechanisms that play a crucial role in social life. Human altruism serves mainly the sustainability of social life and ethics. While evolutionary altruism is directed to one's reproductive success, this is not necessary in psychological/ human altruism.

It appears that psychological altruism generally benefits both the *ethical subject* and the *other.* It is quite probable that without human altruism social unity would be broken. It seems like psychological altruism is caused by social instincts and social interaction, and it serves human's social side. Psychological altruism leads to stronger relations between individuals and in a community. It does not need to be selfishly motivated. As a result of sacrifying oneself and benefiting the *other,* one of the highest obstacle to social life, namely selfishness, is overcome. As I mentioned before a healthy human is born with these social instincts which motivate her to be sensible to the thoughts and emotions of "others." In other

words, these instincts “encourage” her to be empathic. Ownership and awareness of our membership and demand on being related to a community would also lead us to take the well-being others into account.

The altruism, which is directed to people who are not from our family, is named reciprocal altruism. Perhaps, this is a misleading notion, since on an extended view all our relations include reciprocity, either subsidiary or fundamentally. For example, in any ordinary family, the ethical sensitivity of the family members is reciprocal to each other. Therefore so far as reciprocal altruism provides the family with the survival of their genetic inheritance, this “reciprocity” strengthens the family relations, and thus increases the fitness of both the members and the family itself.

What if the “other” is not our friend? Even not a human being but “just” an animal? What would happen in such a circumstance? Even when our circle of acquaintances get shrink and come to an end in larger communities; unfamiliar persons still are worthy of our reciprocal altruism. In this probability, nothing would change. “The altruists will often get the return” (Humphrey, 1997, p.204). For instance, in the case of saving an unknown human’s life or even a dog’s life from drowning our sense of justice, enviromental sensitivity, empathy and mercy are fulfilled.

Surely, getting the return is not automatic and thus not guaranteed. But as a matter of fact, we generally get it. In the example given above, saving the life of an unknown individual will probably return as respect, love and gratitude of the community. These reactions will improve self-esteem, social bonds and make us feel proud of ourselves. However, all of these gains are subsidiary, and the subject does not act with an intention of maximizing her own ends before or after the event.

What we gain from reciprocal altruism in larger communities will be greater compared to smaller groups. Reciprocal altruism works like the insurance system in large communities. You pay your share with the expectation that if you ever need help it will return to you. The community is made up of selves with similar aims and beliefs, who are aware of such unity and agreeing about being related to

it. So this unity and membership requires an agreement about being supportive for each other, namely solidarity; and ideally, every member behaves in a sense of responsibility for each other. This responsibility is reciprocal and motivated by *other-regarding* emotions—empathy, sympathy, justice, mercy etc. as well as collective benefits. Because of that, human altruism is also named as motivated altruism. Thus the greater is the quantity of community members who possess *other-regarding* emotions, the bigger support and aid the individuals acquire. As Darwin stated in *The Descent of Man* (1874): "[F]or those communities, which include the greatest number of the most sympathetic members, will flourish best" (p.110). Moreover Darwin linked feeling of sympathy to expectation for reciprocity, claiming that it is strengthened by habit. "[F]or we are led by the hope of receiving good in return to perform acts of sympathetic kindness to others; and sympathy is much strengthened by habit" (p. 110).

As I mentioned earlier in the example of "saving a drowning unknown man," motivated altruism via members of the community are always encouraged by other members. Moreover, reverse behaviours are despised. Darwin gives an example about the punishment given by the community for egoist behaviour—unconcerned with the welfare of others regardless of their being rational or not. Darwin said,

> Prudence, on the other hand, which does not concern the welfare of others, though a very useful virtue, has never been highly esteemed. As no man can practice the virtues necessary for the welfare of his tribe without self-sacrifice, self-command, and the power of endurance, these qualities have never been all times highly and most justly valued. (p.122)

As Darwin remarked, moral sense is linked to social instincts. He did not, however, regard animals as moral beings, though we see its traces in social animals. To empower his arguments for explaining his theory and transferring the ethical sentiments/instincts from one generation to another Darwin gave examples from animal kingdom, especially from birds, baboons and dogs (pp. 105-106). He

also provided examples about the ethical structure of tribal societies and modern ones in order to show that norms of morality serve the welfare of the community rather than the general happiness.

We come across similar views with other philosophers or sociobiologists as well. Some even attempted to show the roots of evil and good in primates. Although sociobiologists and experts today on animal psychology, with few exceptions, claim that all behaviour stands solely on one principle, "egoism, selfishness." Darwin connected the origin and aim of ethics completely to the social welfare. He says,

> We have now seen that actions are regarded by savages, and were probably so regarded by primeval man, as good or bad, solely as they obviously affect the welfare of the tribe—not that of the species, nor that of the individual member of the tribe. This conclusion agrees well with the belief that the so-called moral sense is aboriginally derived from social instincts, for both relate at first exclusively to the community. (Darwin, 1998, p. 123).

In contrast to the widely accepted *egocentric* view about evolutionary ethics and ethics in general; recent discoveries of primatologists (for instance, Frans de Waal 1996), approve that Darwin's assumption about evolutionary ethics is highly probably right. De Waals' discoveries on primates and observations about big mammals gave big excitement to the scientific community. Since his findings which are stated in his book, *The Origins of Right and Wrong in Humans and Other Animals*, show the remarkable roots of sympathy, caring and other sentiments in primates and big mammals egocentric view seems to go under a big crash. De Waal criticizes anthropodenial and behaviorist views and says that:

> There are, for example, the behaviorists, who follow psychologist B. F. Skinner in viewing the actions of animals as responses shaped by rewards and punishments rather than the result of internal

> decision making, emotions, or intentions…Behaviorists are not the only scientists who have avoided thinking about the inner life of animals. Some sociobiologists-researchers who look for the roots of behaviour in evolution-depict animals as "survival machines" and preprogrammed robots" put on earth to serve their "selfish" genes. There is certain metaphorical value to these concepts, but it has been negated by the misunderstanding they've created. Such language can give the impression that only genes are entitled to an inner life…As soon as we admit that animals are far more like our relatives than like machines, then anthropodenial becomes impossible and anthropomorphism becomes inevitable-and scientifically acceptable. (pp. 50-52)

Charles T. Snowdon (1997), in his review of de Waal's book, says;

> Three conditions lead to the evolution of morality; an individual's dependence on a social group to find food or defend against enemies or predators; mechanisms for cooperation and reciprocal exchanges within a group; and individuals having disparate interests that must be resolved in order to preserve the benefits of living in a social group. Conflicts of interest between individuals over access to resources arise constantly, but organisms must develop mechanisms for resolving conflict to maintain social stability. The drawbacks to competition can be bodily harm, disruption of a social relationship, or harm to group unity. The defense of community or group occurs when each individual or its kin will benefit from the maintenance of the group. Thus, de Waal argues, social animals have evolved to inhibit actions that disrupt group harmony and to balance private interests with peaceful coexistence." (p. 1088)

Indeed the classical egocentric view of ethics has always been a weak argument since its beginnings. Its weakness comes from its radical individualist structure and its undervaluation of the social side of human beings. According to Callicott, with their explanation of ethics, which takes sentiments as the greatest possibility for the origins of ethics, and never ignoring the value of social affairs in ethics, Adam Smith and David Hume appear to be the friendliest thinkers who are much closer to the view presented in this thesis. As Callicott says, "[s]ince in the animal kingdom feelings or sentiments are arguably far more common or widespread than reason, they would be a far more likely starting point for an evolutionary account of the origin and growth of ethics" (p. 79).

Since ethics arises from the necessities of living together in a community, the dynamics of ethics are related to the dynamics of community. It means that, when the community changes then its ethics will also inevitably change, and vice versa. As its members, communities may keep and become more fit and stronger by their systems of ethics. Without ethics, a community would loose its power and then, would not survive any longer.

A brief look at the history of morality, we can see the parallel between the social changes accompanied by changes in moral norms. Today, all the societies in the world are going under a process of unification that will probably affect our ethics as well. The ideal of human rights that comes after civil rights is the next theoretical step. As Darwin says:

> As man advances in civilization, and small tribes are united into larger communities, the simplest reason would tell each individual that he ought to extend his social instincts and sympathies to all the members of the same nation, though personally unknown to him. This point being once reached, there is only an artificial barrier to prevent his sympathies extending to the men of all nations and races. If, indeed, such men are separated from him by great differences in appearances or habits, experience unfortunately shows us how long it is, before we look

> at them as our fellow creatures. Sympathy beyond the confines of man, that is, humanity to the lower animals, seems to be one of the latest moral acquisitions. It is apparently unfelt by savages, except towards their pets. How little the old Romans knew of it is shown by their abhorrent gladiatorial exhibitions. The very idea of humanity, as far as I could observe, was new to most of the Gauchos of the Pampas. This virtue, one of the noblest with which man is endowed, seems to arise incidentally from our sympathies becoming more tender and more widely diffused, until they are extended to all sentient beings. As soon as this virtue is honored and practiced by some few men, it spreads through instruction and example to the young, and eventually becomes incorporated in public opinion. (pp. 126-127.).

But then we may have to face an important question; what if any conflict arises between our local ethical systems and the so-called universal one? This is called the ethical challenge of modernity. The question is as to how can social beings change into universal beings. Since domestic and foreign affairs are fastly, deeply and unchangeably intermeshed in today's world, nations cannot be described as self-sufficient for the essential needs of their citizens anymore. So that, citizens belong to various nations all over the world integrates increasingly into a single human community. Global ecological problems, organized crime, problems of inequality, injustice and interdependencies on economical relations lead nations to engage in the union of human community. Thus, people from different cultures around the world become citizens of a human community under the denumerator of an intermeshed culture. So ethical borders together with cultural, economical and other kinds of borders between communities are being wiped out in a process. Therefore the very idea of unification of ethical norms can be justified under the theory of community-based ethics.

Scientific community has all the characteristics that I described above which belong to a community; scientific community cannot survive without its ethics and

I will argue with the help of some examples that scientific community has a geniune ethics, problems, rules and solutions arisen from the internal structure of itself. Furthermore, since science ethics and general public ethics are not more valuable and preferable than each other, and since any ethical structure could only be judged under the internal dynamics of its society's own (these dynamics are community's traditions, culture etc.), but not under another system, science ethics could only be judged by the rules of its own ethical system, and only could be understood from the aspect of its conditions. In the upcoming chapter, I will analyze the internal structure of scientific community and scientific freedom. Since ethics means limitations on freedom in a positive way, I will display that scientists cannot be free from any kinds of limitation. Because of that, without internal limitations, scientific progress will be interrupted and scientific community will degenerate. I will also show relations between internal and external limitations and the constraints and norms arising from these relations-interdependence relations.

CHAPTER III

SCIENTIFIC COMMUNITY AND ITS ETHICS

In the previous chapter, I repeated Leopold's claim that ethics which is connected with our social side is no more than limitations on individuals' freedom of action which is an inevitable result of socializing and living in a community. In other words, "[e]thics are possibly a kind of community instinct in the-making" (Leopold, 1970, p.239). On the basis of this insight, I introduced the idea that science is an activity of scientific community, and also that ethics is an undeniable requirement for the sustainability of scientific community as well as any other community. Furthermore I argued that as the internal structure, dynamics and needs of every social community are different, so are their ethical norms.

In this chapter, I argue that scientists form a community that has a unique internal structure as any other community. Then I argue for the strong connection between scientific community and science ethics that is the ethics of this unique community. Finally, I examine the relationship between scientific community and other communities. I argue the ethics of other communities are "external" to scientific community (that is, they are not the norms of scientific community). When there arise conflicts between the internal norms of scientific community and the norms of other communities (in virtue of the fact that scientists are also members of other communities and the scientific community intersects with other communities) the internal norms of science do not have priority over norms of other communities to which scientists also belong. Depending upon the value that is given to science in large communities, scientists and non-scientists may decide in favor of or against the internal norms of science.

3.1. A Historical Perspective

Knut Erik Tranöy (1996) says;

> Scientific research, whether old or new, is a highly deliberate and purposive human activity. It is this activity, and no other, which produces what we call scientific knowledge. Scientific research is the systematic and *socially organized* :
> (a) Search for,
> (b) Acquisition, and
> (c) Use or application of knowledge and insight brought forth by acts and activities involved in (a) and (b). (pp. 185-186)

I think it is plausible to assume that science is a *socially organized and professional activity* of scientists. Today, science has already become one of the most prestigious professions which occupies an important place in society and has a strong influence on every part of life. As a result, science is rapidly evolving into a leading figure that influences even the lives of simple people. Indeed, this new perception of the role of science has developed in a long time and passed through various stages. Science has advanced as a *socially organized and professional activity* since 17th century although the history of science goes as far back as the ancient periods. Before the 17th century, there were no scientific societies and journals or uniform scientific methodology, thus no scientific community. Ancient Greeks and Islamic scholars in the middle ages contributed to science great deal. Greek and Islamic scholars made significant developments especially in mathematics, astronomy, medicine and optics. It needs to be reminded that science was, more or less, an individual activity before 17th century. In other words, scholars made these important scientific works on their own with the motives of curiosity and desire for attaining knowledge.

Developments in science have accelerated with the foundation of scientific societies in 17th century. Scientific societies constituted a unity of scientific community. Scientific activities not only accelerated but were also organized especially by a scientific methodology that was established by the works of Francis Bacon and Descartes in this century. As a result, scientific activities and scientists became unified as scientific community.

> [S]cientific correspondence continued to be of great importance during the latter part of the century (17th century) and the letters of men as important as Newton and Leibniz contain ideas which cannot be found in their more formal works.
>
> During the second half of the seventeenth century, however, other methods of spreading scientific knowledge besides books and correspondence came to the fore with the creation of scientific societies and journals. The new societies were specifically designed to advance knowledge by promoting co-operative scientific work among their members. The most notable were the Royal Society of London and the Académie Royale des Sciences of Paris, both founded in the 1660's. (Smith, 1972, p.82)

After developing into a scientific community, scientific activities and control mechanisms started to develop. The community employed cooperation and controlling mechanisms, such as journals and scientific societies which contributed to the advance of science. In addition, well equipped scientific laboratories were set up in the early 1650's that became centers of scientific discussions and experiments. Gradually, scientific activity changed into an organized, critical, selective, systematic and methodological study, namely a professional activity. Before the foundation of scientific societies, scientific correspondence was almost the only way for scientists to interact at the beginning of the 17th century. After that, scientists began to come together regularly at informal meetings in 1640's. Indeed, both of "English Royal Society (and) Académie Royale des Sciences...arose from these informal meetings of scientists" (Smith, 1972, p.84). Meetings became more formal as they proceeded. Scientists were "[d]iscuss(ing) scientific problems and suggest(ing) fresh researches" (Smith, 1972, p.84). So that these meetings can be described as the former types of modern scientific conferences, panels and symposia. Modes of co-

operation created solidarity among scientists, and science was no longer an activity of semi-isolated individuals. Eventually, scientists integrated into a single scientific community. Before scientific community formed, scientists were controlling reliability of their researches only by self-correction, through the reasoning and observation processes. After being integrated into a single community, they had to possess a professional responsibility and undergo peer review processes. This control mechanism obliged scientists to conduct objective and reliable research.

After becoming a member of scientific community, together with curiosity and desire for acquisition of knowledge that were still main imperatives for scientific activity, scientists became responsible for being objective even when it harmed their career. The 17th century scientists realized that prejudices, such as that all Aristotle's claims about scientific issues are true, would prevent scientists from reaching clear and distinct knowledge of the structure and behaviour of nature, life, substances, reality, facts etc. And it lead the scientists to conduct in accordance with this norm, namely objectivity of science, despite the fact that church and institutions of religious orders, who were supporting Aristotelian doctrine, were influential and powerful figures. On the other hand, some of the scientific societies were backed by the government.

> Although The Parisian Academy was very closely tied to the State, which appointed the Academians and paid their salaries, whereas the Royal Society was completely independent of government and its Fellows elected their own colleagues, who rapidly grew in numbers to well over a hundred, far more than the handful of French Academians. (Smith, 1972, p.84)

Although scientific societies were initially directed to practical use of science, mainly because of the constraints by governments, it didn't last for too long.

> In their early years both institutions laid some stress on the practical value of scientific researches. The Royal Society set up a committee for the history of trades, which concerned itself with industrial technology. The Académie Royale des Sciences started a collection of tools and machines and examined new inventions which were submitted to it for approval.
>
> This Baconian concern for the practical uses of science did not last very long as far as the Royal Society was concerned, and if it did persist longer, in theory at least, in the work of the Académie des Sciences, this was largely because the latter was under firm government control. The Marquis de Louvois, the war minister…thought that scientific inquiries should be made to serve useful ends, by which meant research 'that relates to the service of the king and the state'. (Smith, 1972, p.85)

When scientists recognized that concerned solely about practical ends could restrict scientific activities and scientific improvement, they started to put more effort on theoretical science.

> These efforts to harness science to practical ends produced little of significance in either Paris or London, and the theoretical work of both societies in such fields as biology, physics and astronomy was more important. (Smith, 1972, p.85)

As a conclusion, at the beginning of the formation of scientific community, norms of science ethics started to appear gradually and become influential on the activities of scientists. Scientists recognized the inescapable fact that putting internal limitations on scientific freedom was a vital necessity to conduct scientific researches and to preserve the unity of scientific community.

The creation of scientific community contributed a great deal to the development of science. Its internal dynamics such as especially the modes of co-operation, interaction, competence, solidarity, responsibility etc. served to improvement of science.

> The specific contributions which the Royal Society and the Académie des Sciences made to scientific knowledge in the latter part of the seventeenth century were useful, but more important perhaps was the idea which they enshrined of science as a co-operative venture, an idea which only really took root in that century and which was to be of the very greatest importance in the years ahead. This idea of co-operation among scientists was also aided by the establishment of scientific journals. (Smith, 1972, p.85)

Scientific journals had become not only the means of critical analysis, communication or criteria for standardization of scientific studies but also a bond between scientists and educated lay public. Furthermore, as formal meetings of scientists, scientific journals became centers for evaluating whether scientific studies are fitting the norms of science ethics.

> [O]ne of them the Journal des Sçavans…came to be an organ of communication not only among scientists themselves but also between scientists and an educated lay public, both in France and elsewhere in Europe, who were increasingly interested in scientific affairs. It published not only detailed results of experiments but also matters of general scientific interest and became the model for all subsequent scientific publications designed to appeal to wide reading public. (Smith, 1972, p.88)

Latter journals served for a more specialized readership. Journals steadily developed into more standardized publications. Accordingly, latter journals became instruments for evaluation and communication of scientific studies and researches. Through the critical analysis of communal process along centuries objectivity, reliability, rationality, impartiality became foremost qualities of scientific activity.

3.2. Scientific Freedom and Responsibility

3.2.1. Scientific Freedom

Michael Dummett (1981) claims that the problem of scientific freedom should be examined as two (relatively independent) problems: "The freedom of scientific *enquiry* and the freedom to *communicate* scientific results" (p.281). According to Dummet, the freedom of scientific inquiry comprises of the freedom of choosing and conducting scientific research. The freedom of communicating the results of inquiries should also be considered as two independent problems: the freedom of communication among scientists themselves and the freedom of "the communication of scientific results and conclusions to the public at large" (p. 283). He argues that the freedoms of scientific inquiry and sharing scientific data with colleagues are the basic, undeniable freedoms of science. Nevertheless, Dummet does not think that distribution of scientific results to the public at large is part of scientific freedom, though it is part of the general freedom of speech. The reason is that as scientific matters are distributed to the public it ceases to be a scientific matter anymore. It becomes part of political and social affairs that do not have the kind of self-correction system as science has. On the other hand, the freedoms of inquiry and sharing results with other scientists are necessary for the progress of science. Therefore since scientists need these freedoms that are the preconditions of scientific progress they have positive duties to remove all the obstacles that disturb freedoms of scientific inquiry and internal communication. I think these responsibilities should also include willingness to criticism, to not fudge scientific data, to not mislead, plagiarise, hide the source of citations and should be willing to

give a complete, right and full report of references, for otherwise the internal communication will be distorted.

Tranöy (1996), on the other hand, examines scientific freedom from a different, though related, perspective. Science as as an activity of a search for truth comprises of two related processes:

> [S]earch in the science policy sense, and the design-of-projects kind of search. The distinction between these two kinds of search for knowledge is important from an ethical point of view. For the latter kind of search ... can only be organized and implemented by qualified researchers. The policy kind of search presupposes a (far from "value free") political decision-making capacity and responsibility in the first place, in addition to participation from professional researchers.
>
> Clearly, search in the design-of-projects sense can be (very nearly) value neutral in relation to social and political values; my main point right now is that nobody except the scientists themselves can be responsible for this kind of search for knowledge. (p. 186)

The process of "the search in the science policy sense" does not leave much room for scientific freedom since it is a value-laden process that would be interfered by non-scientific concerns of both policy makers and scientists. In other words, scientists are not free to choose and pursue any kinds of research on strictly scientific grounds. They have to choose only within the limits of general science policies. However, they have freedom during "the design of projects" because this process is value free that allows scientists to design their projects only on the basis of scientific concerns.

Tranöy also argues that " 'Macro' science policy is mostly a matter of political responsibility and initiative while 'micro' science policy is largely an 'internal' scientific community kind of search. Ideally, and to a great extent in fact

as well, this kind of search is in the hands of the researchers themselves" (pp. 188.-9). It seems that the intersection of Dummet's and Tranöy's views might give the limits of scientific freedom: Dummet's freedom of inquiry should correspond with Tranöy's design of projects that, on the other hand, should include freedom of communication of results among scientists themselves. Although this might be illuminating I argue in the following sections that scientific activity should be seen as a community affair that more or less determines both the freedom and responsibility of the scientist quo scientist. Nevertheless, Tranöy's notion of "internal scientific community kind of search" seems to be similar to my "internal structure and ethics of scientific community." Of course, I do not deny that scientists can also be and, in fact, are members of other social groups (that may determine macro policies of science in Tranöy's sense). It is obvious that since the dynamics and inner structure of each community are different, each group would have its own norms that may, however, lead to moral dilemmas for scientists when they are in conflict. These communities can be interdependent (such as religious communities) providing a financial support for scientific institutions. Ethical norms do not only arise from the inter-dependence relations inside of a community, but also from the reciprocal relations of the communities.

For a long time now, public and science policies have become united with the justification of public benefit. Thus, it shows that within the boundaries of macro policy, there is no freedom for science. Macro policies are determined by non-scientists (or even scientists) with extra-scientific, namely non scientific concerns. But how can science be free of limitations within micro policies if it is not within macropolicies? Scientists have to face any constraint or restraint on their conscience in scientific society e.g. too; in addition, they can be forced to obey any imperative opposite to their conscience inside or outside of the scientific community.

Ideally scientific community should have full control about scientific issues. The preservation and restoration of trust between scientists is only possible with a high awareness and responsible attitude of scientists towards scientific issues. Sustainability of solidarity, hence co-operation among scientists is only possible to

the degree that trust is maintained. For example if any unethical behaviour is made by scientists in their scientific activities and studies, scientific community would interfere and do whatever is needed. So this is clearly a limitation on the freedom of conscience.

But if a scientist obeys the State's oppression, he would be guilty for risking the values of scientific community and science as a professional activity. There are examples of scientists who have stood against such oppressions. For instance, Oppenheimer protested against government's nuclear policy. This behaviour is the basic provision of the responsibility of being a scientist. Nevertheless, scientists are not free from any kinds of limitation in acquiring scientific knowledge for its own sake. As Deborah Johnson (1996) says: "a society such as a nation or state might be justified in granting scientists a high degree of self-regulation, but never in granting freedom of inquiry in an unqualified sense" (p. 197).

3.2.2. Scientific Responsibility

If any harm occurs indirectly because of scientific activities then is it fair to blame science and scientists? Scientists may not be able to foresee the all the possible results of a theory in the far future. But we can blame scientists when especially there is no serious risk analysis. For it points to a deliberate negligence, untidy, messy and inattentive behaviour against science. Although scientists should not be held responsible for all possible consequences of their research, predictable harmful consequences of research or distribution of scientific knowledge to the public at large that may predictably lead to harmful effects on public is not ethically so unproblematic. For instance, if a scientific research can be tested only by a nuclear explosion in the atmosphere the scientists who are conducting this experiment cannot argue that they cannot forsee the possible harm of such a test. Thus, scientists are responsible for considering and weighing the results of their activities very carefully. So it seems that the value of knowledge to be attained as a result of such dangerous experiments should be determined by its place in the scale of values. That is, how valuable is such knowledge that can be

attained as a result of a dangerous experiment? Although there may be too many values on this scale we might like to put the basic human values on the top of our list for good reason. Considering, for instance, that the right to live is the first and the most fundamental right of all creatures this value judgment seems to be quite reasonable.

Let's consider the following example: Assume that volunteers are needed for a scientific research about developing a medicine for cancer. There are results which could be foreseen by scientists as well as those which couldn't. So it becomes hard to analyze risks. According to Singer (1996), even an experiment with the least uncertainty is unethical, regardless of the willingness of volunteers. No matter how much the subject is informed about all the probabilities as well as the existence of unforseen results such an experiment is unethical because of uncertain factors. In Singer's (1996) words; "the protection of fundamental human rights … takes precedence over the freedom of science and over the benefits that promising scientific research projects may bring" (p. 219). "Deliberate behaviour" may also be a reasonable criterion in evaluating behaviour. Any harm which is not caused deliberately during scientific research may not necessarily cause any negative opinion about the freedom of science. Let me give an example: assume that there were a serious danger about the health of millions of people due to a virus, and scientists had to develop a vaccine in a very short term. Under normal circumstances, such a vaccine had to pass through many experiments and a long trial period. Suppose this vaccine worked and virus did not kill anyone who had been given the vaccine by the decision of political authorities together with scientists. However, several years later a kind of brain damage was observed in these people who had been vaccinated. Nevertheless investigations did not point to any clear relation between the vaccine and the brain damage. I think scientists are not responsible for the damage since there is neither harm caused deliberately nor negligence in scientists' attitude.

Asking whether or not science may have harmful effects means questioning whether scientific actions (that is collecting and gaining knowledge, publishing the results of investigations and experiments etc.) may have harm on humans, animals,

plants or nature. The core of the argument is the intention of the action. If the harmful effects and results of the scientific action are foreseen, and scientists did not attempt to prevent by whatever means they had in hand, then they would be guilty of these consequences. They are guilty of acting intentionally, willingly, or carelessly with such a negligence and lack of providence.

3.3. The Structure of Scientific Community and its Relevance to Science Ethics

Despite the fact that there are various definitions of ethics, in general, ethics can be understood as ideas, beliefs and behaviours influenced or motivated by *other-regarding* emotions—empathy, sympathy, justice, mercy, enviromental sensitivity etc. about what is morally right or wrong.

In this thesis, I endeavor to analyze science ethics in order to describe its origin. I argue that norms of ethics are social products, thus can be understood only in relation to social contexts. So, social reality must be taken as a ground for the understanding of descriptive ethics. The distinguishing characteristic which shapes norms of some ethics is not a person's opinions, but the social reality, namely being member of a community.

As I said in the first section modern science arose in the 17^{th} century with the foundation of scientific communities. I think although there can be science without community there cannot be science ethics without scientific community because, as I said in the first section, ethics is a limitation on freedom of action of individuals in a community. The scientist's scientific acts might be limited by the public, or his conscience can prevent him from conducting a particular scientific research. But I do not include either of these limitations in science ethics because in these cases the scientist's conscience simply mirrors the public's ethical norms. I consider such limitation emposed upon by society as external to science.

As I discussed in Chapter II, if ethics arises from the community itself, then science ethics should be a product of the structure of scientific community. Being a member of scientific community means "being a scientist in scientific community" given that its members' common denumerator is "science." In

addition, science can not be qualified as a variable discipline which changes in different cultures. As it was stated above, science has its unique culture and history shared by all scientists.

3.3.1. The internal structure of scientific community

I said in Chapter II that moral rules reflect the internal structure of a community. Then the norms of science ethics should also reflect the internal structure of scientific community itself. For instance, honesty and openness (in the sense of openness to criticism and of making scientific data available for every one) are two of the most important norms of science, as they are of most of the other communities. These norms are related to basic human sentiments such as rivalry, the need for approval, solidarity and collaboration. It must be remembered that scientific community is not just a professional community but also a social group which could not be isolated from the psychological and social motives of its members. Social dynamics and the need for socializing are the most important reasons for sustaining a scientific community. Thus science ethics arise from social needs and could not exist without the unity of community, and unity of community is not possible without ethics.

The question then is as to what kinds of relation are these norms supposed to sustain between community members? I think these norms point to two important kinds of community relations: science is both a competitive and cooperative activity. Scientists try to get the recognition of the community as the discoverer of a particular hypothesis or patent. In other words, scientists compete to be the first to make a discovery or get a patent. This competition is the "fuel" of scientific activity. However, in order to sustain this competition the all parties should be honest and open in their conduct, otherwise people would refrain from competition. Science is also a cooperative activity in the sense that everyone works on the results of others. They develop an already-existing idea or a new one on the basis of old ideas. So they have to be honest in representing their results and allow others to access their data. Scientists should not hide their works and their results

from scientific community. The principle of transparency is one of the basic principles of science. Thus uncertainty about the consequences of a test or research seems to violate this basic principle of science. It is unethical and contrary to norms of science ethics. The aim of exchanging opinions and results is both for benefiting from them and also for peer review processes that allow other scientists to check the results, and to approve or dissapprove them. There are criteria for the preparation, evaluation, presentation and furthermore criticism of observations, experiments and theories, which are determined by ethical rules. Accepting these conditions is a prerequisite for being a member of scientific community.

The norms of science ethics surely arise from the structure and dynamics (that is interdependence relations) of scientific community; as other kinds of moral rules. A scientist who performs his investigations in isolation from the scientific community would not need to develop any ethical rules for her science. When science becomes an activity of the scientific community scientists have to obey such limitations, as any member of any community must obey the limitations of a community in order to remain part of this community. Thus, scientific freedom in the sense of being free from any kind of limitations is not a precondition of science anymore.

These and similar relations should be sustained in order to continue science as it is. The norms that help sustain these relations are limitations on the freedom of action of individual scientists. Although these are limitations on the freedom of scientists they limit scientists in a positive way. For these limitations on individual conduct support the sustainability of scientific community that is necessary for scientific activity. So limitation supports scientific progress by supporting the sustainability of scientific community and by supporting the fundamental community relations (competition and cooperation). Thus limitations of science ethics are necessary for the progress of science as a community affair. But external limitations (that is, limitations imposed upon the scientific community from other communities) may have negative effects on scientific progress because they are not necessary conditions for the existence and sustainability of the scientific community.

In considering the internal structure of scientific community, we should also discuss as to whether scientific community has any shared goals. I said in the second chapter, under the description of community that the concept of community is derived from the root "common" implying that certain things are shared. And the foremost of these common factors shared by the members of a human community is common purpose. As any kind of community, scientific community cannot exist without any goals either. There seems to be at least two common goals of scientific community: the first is seeking knowledge for the benefit of the public at large and the second is seeking knowledge for its own sake. The former is the result of the fact that scientists are also members of other communities. Since scientists as members of other communities destined to live in these communities they might feel to contribute to the well-being of these communities. I think the latter, however, is more truly the purpose of scientific community. Whatever may be their contribution to other communities such a contribution is not a necessary part of the goals of scientific community. It is in principle possible that a scientific community exists and is sustainable without any contribution to other communities. Hence the first and foremost aim of scientific community is to attain true knowledge or, if not possible, at least to obtain knowledge that is closest to this ideal, namely theories. This ideal that distinguishes scientific activity from other kinds of human activities (thus scientific community from other communities) is the source of the requirements of science ethics for only on the condition of science as a truth seeking activity would require honesty and openness that would sustain this activity.

A final issue that I like to discuss is power relations that may arise among scientists within scientific community and between scientific community and other communities. Power relations within scientific community might distort competition and cooperation of scientists and might be detrimental to science. On the other hand, scientists need funds and other sources in order to conduct scientific research. So scientists seem to be dependent on extra-scientific sources that may be controlled by centers of powers that are external to science. As long as these do not distort the internal mechanisms of science it should be welcome by scientists as

scientists. Of course, as I discuss in the final section of this chapter, it does not follow that external restrictions are, in principle, undesirable, for it depends how much scientists as members of other communities would want the benefit obtainable from a particular research. As I said earlier, it is a matter of the value that we attach to a particular research. If it ranks lower than other values than we may decide to stop this research.

3.4. Science Ethics

In Chapter II in agreement with Darwin, I argued that norms of morality serve the welfare of the community rather than general happiness. I also claimed that moral norms arise from the necessities of living together in a community. The examples that I quoted from Darwin suggest that the dynamics of the moral norms in a community are related with the dynamics (interdependence relations) of the community: when the interdependence relations (the internal structure) of the community should ever change, its ethics (the moral norms) will inevitably respond to it, and vice versa. In some examples, the change in the community seems to be followed by the ethics of the community suggesting a strong correlation between the community and its ethics. Moreover, I argued that as individuals, communities may also sustain their fitness or become fitter by their system of ethics. Hence, without ethics, a community cannot support itself, and cannot survive. Ethics is a kind of *guarantee* for the preservation of the community's unity and the continuity of social relations in peace.

Since the subject of ethics is human conduct, the subject of science ethics should be scientific activities that include controlling, critisizing, organizing, evaluating, publishing, etc. of knowledge that can be evaluated under the concepts of right and wrong. I argue that the norms for the evaluation of right and wrong arise from the internal structure of scientific community. Since the norms of science ethics arise from the internal structure of scientific community, science ethics is specifically the ethics *of* scientific community, as ethics, in general, is the ethics of a particular community. Furthermore science ethics is a precondition of

scientific progress in the sense that divergence from science ethics can put an end to science as an activity of a professional community. (I should remind my earlier contention that semi-isolated individuals can, in principle, pursue scientific activity.)

Following on my last remark, if science were still an activity of semi-isolated individuals a scientist who is convinced of a particular scientific hypothesis that was the end-product of a process of reasoning, observations and experiments, and was evaluated (and perhaps improved) by self-criticism would not need to seek acknowledgment by others. On the other hand, the scientist who is a member of a scientific community has to go through peer-review processes for recognition, affirmation, or even for refutation. For by the formation of scientific communities, science became a competitive and cooperative community affair. As I asserted in the first section of this chapter, competition and cooperation became the specific modes of interdependence relations of modern scientific community. Accordingly, the norms of science ethics started to develop primarily for the conservation of a fair competition and widespread cooperation among scientists.

Now I should specify some particular moral norms of science ethics that are, as I argue, supposed to sustain the (universal) modern scientific community. It is better to start with some possible types of misconduct over which the norms of science ethics range. There are various forms of misconduct in scientific activity. Plagiarism, fabrication and falsification are some of them. Plagiarism is "the misappropriation of another's work or ideas" which is both a theft and deception. (http://onlineethics.org/essays/research/cw2.html) On the other hand, the plagiarist does not deceive others by false conclusions about scientific issues; but make them "believe a false attribution of authorship or invention." (Ibid.) The plagiarist deceives others by lying and trying to make them believe another's words or ideas are one's own. (Ibid.)

Falsification is "manipulating or misrepresenting data, experiments or other significant matters, such as credentials of an investigator in a research proposal." (http://onlineethics.org/glossary.html) Manipulation of data can be made in two stages of scientific activity. For example, a scientist can manipulate raw data in

order to derive confirming results in favor of a claim or idea about scientific issues, or manipulation could also be made on the results of experiment again in favor of supporting an idea of one's own. Fabrication is to invent facts and experimental data in order to deceive others. In many ways, falsification and fabrication are similar misconducts. Both of them are a kind of deception by false conclusions and are generalized under the concept of fraud, deceiving others intentionally by "false respresentations or reckless disregard whether representations of data are true or not." (Ibid.) These rather "objective" kinds of misconduct are basically some of the most important wrongdoings that are prohibited by the norms of science ethics for the sake of the sustainability of scientific community. However, there are other kinds of misconduct the source of which can be traced back in the personal histories of individuals and that, nevertheless, have important influence on the structure (i.e. the interdependence relations of individuals) of scientific community. Below, I briefly describe some of these more individualist types of misconduct and their relationship with scientific activity.

As I mentioned in the first section, scientists had already explored at the beginning of the 17th century that prejudices about scientific issues would prevent them from attaining clear and distinct knowledge of scientific facts. For instance, the Aristotelians in the 17th century stubbornly opposed to the scientifically confirmed facts in a conservative manner. It seems that prejudices are based on feelings, misbeliefs, dislikes etc. but are not completely unavoidable. Thus prejudice becomes a deliberate act in some respect. As far as codes of science ethics are concerned, being stubbornly insistent on prejudices against scientific facts implies behaving in an irresponsible way. A prejudiced scientist at a university may mislead young and inexperienced researchers; or a prejudiced scientist as a referee may influence the publication of an article for a scientific journal. For example, although a male scientist's prejudice against women cannot be considered as blameworthy in the context of science ethics, unless it leads the scientist to make deliberate and unjust treatment of a woman researcher. For this reason, prejudices may go so far as to hinder the flow of data and violate the harmony of relationships (trust and solidarity) between scientists.

Negligence and recklessness are other examples of wrongdoing in scientific activities. Indeed, recklessness differs from negligence in the amount of care and attention. In the context of scientific activity, negligence means not giving sufficient care and attention to some scientific issue in which the scientist is in a "morally responsible position to exercise care." (Ibid.) Recklessness is a "more serious misconduct than negligence", and named as gross negligence. Recklessness is doing something dangerous and not caring about what might happen. (http://onlineethics.org/essays/research/cw2.html) Recklessness and negligence can be considered as misconduct insofar as they interrupt scientific activity. Let me give an example again: if a pharmacologist who is occupied in a drug research is negligent in the duty of noting experimental data correctly, it will lead scientists to endanger people's lives by application of misleading knowledge without intent to hurt anyone. Furthermore, such a negligent behaviour will endanger the integrity of research. Since scientific knowledge is accumulated in a process, data derived from an ill-informed research report will affect this process negatively. If negligent behaviour is done with such a disregard, then it includes an intention to deceive. It is important to distinguish between negligence and carelessness. Carelessness which is not ethically blameworthy is a kind of honest mistake. Even a careful and meticulous scientist may behave carelessly. Recklessness, on the other hand, implies a clear irresponsibility which is a deliberate wrongdoing. It is totally opposite to professional responsibilities. For example in a laboratory, a scientist is not allowed to conduct research in an imprudent way.

Conflicts of interest may also lead to misconducts. A person has a conflict of interest when she has a mutually conflicting wishes or interests, and cannot satisfy all of them. Conflict of interest is dangerous on the grounds that it may lead scientists to satisfy one's own profits disregarding the harmony of co-operation and trust relationship among scientists. Let's assume that a scientist wants to make a lot of money, who occupies a position in a government-funded research and is required by law to not share the results of the research with private firms before they had been declared to public. In such an instance, if scientist shares the data

with any private company or for-profit company, it will lead to an unfair competition. Therefore it will affect the dynamics of scientific activity negatively as well. Since competition is one of the foremost motives for scientific activity, an ethical abuse like unfair competition may ruin scientific activity.

Trustworthyness and trust relationship have a great significance for the sustainability of scientific community. As I explained in terms of science ethics above, interaction between scientists is mainly founded on mutual trust. Scientific studies are reliable insofar as scientists are honest. This trust relationship is reciprocal. Scientist who trusts other is trusted in some way. So with a full awareness and care, every scientist should fulfil the responsibility of not allowing others to erode trust relationship among scientists. Scientists must give attention to this awareness as well as to their research practices.

Now, I can start to examine the significance of science ethics for the sustainability of scientific community and the progress of science. In this examination, I consider scientific community and scientists in isolation from other communities, thus from the norms of these communities. In the next section, I examine the relationship between internal and external ethics (that is, whether there may arise any conflicts between the norms of scientific community and those of other communities and, if ever to arise, how these conflicts can and should be resolved).

At the beginning of this section, I briefly described some of the possible kinds of misconduct that may arise within the scientific community. These kinds of misconduct are those behaviors that the norms of scientific community should be expected to prohibit in order to sustain the community and guarantee scientific progress. These norms that prohibit certain kinds of behavior obviously limit scientific freedom. In other words, it is these norms that define restrictions on scientific freedom that scientists ought to obey for the sake of *conducting* scientific research. In this sense, these norms are differentiated from the external norms (that is, the norms of other communities) that are *not* required for scientific activities. This claim comprise also of an answer both to Dummet who argues in favor of “the freedom of scientists to pursue whatever lines of investigation they see fit” (p. 281)

and Tranöy who argues that "search in the design-of-projects sense can be (very nearly) value neutral in relation to social and political values" (p. 186). Considering that both philosophers are rather conservative regarding the freedom of science (that is, they agree that scientists should not have absolute freedom), this claim to be defended in this section is important to show that the freedom of science can and should be limited even in their restricted sense, and this restriction is for the sake of science and scientific progress. Of course, I should emphasize that the restriction for which I argue comes from *within* the scientific community. Thus in this sense I agree with Tranöy that the norms of science ethics do not derive from "social and political values" (of other communities). The norms of which I speak determine, in a way, the minimum limitations imposed upon scientists for the sake of science. To emphasize, I claim that there are those internal norms of science deriving from the internal structure of the scientific community that restrict the freedom of science only for sustaining the scientific community, thus contributing to the progress of science.

By arguing that there are some internal norms of science, I do not commit myself to a stronger claim that these norms are favorable in all cases. In other words, I am not arguing that these norms are to be preferred by scientists regardless of what other norms of other communities of which scientists are members are. My claim is simply that the internal norms are necessary for the sustainability of science and scientific progress and are to be valued so far as science and scientific progress are valued. That is, these norms are not more valuable than other norms regardless of how much we value the sustainability of science and scientific progress. It is quite possible that scientists give up science and scientific progress if they greater values that are in conflict with the norms of internal ethics. Since my understanding of ethics is defined relative to a community the norms of science important in so far as scientific community is concerned. Of course, this is only an abstraction because scientists can be and usually are members of many communities at one time. I do not suggest that a resolution can always be achieved by favoring the norms of science a priori.

3.5. Relationship between Internal and External Ethics

The most important difference between internal and external ethics is not their relative significance but the vitality of internal norms for the sustainability of scientific community and scientific progress in contrast to the arbitrariness of the external norms regarding the sustainability of scientific community and scientific progress. It does not mean that scientist would or should respect only internal norms just because these are the norms of scientific community: neither is superior to the other in an absolute sense. The interdependence relations of the members of communities make the difference. So that scientists may decide to give up their research if they believe that that research conflicts with other values that they respect more, as in the Oppenheimer example.

As I said earlier, scientists are not members only of scientific community. They are part of many other communities, such as local or global communities of cities, nations, federations, etc. Furthermore scientific community itself may be part of other communities in the sense of intersecting or overlapping with them. Every community has an internal structure that corresponds to the interdependence relations among its members. Some of these communities may even have similar internal structures. Since scientists are citizens and members of other communities as well as scientific community, they would consider facts according to the terms of moral norms that arise from their cultural relations, religious beliefs etc. Scientists' beliefs and values are rooted in their cultural inheritance and may influence their reactions to ethical issues. As any one can be confronted by conflicts of values as a result of being member of different communities the values of scientists deriving from scientific community and other communities may also come into conflict. There may be different types of conflicts that may arise. I examine two of them: (i) conflicts between external and internal norms, and (ii) the restriction of scientific freedom as a result of external norms.

As for (i), it is obvious that scientists may have responsibilities both to scientific community and other communities of which they are member, because scientists are not only researchers but also citizens and civil servants who are paid

by the government or private companies. Scientific research is usually sponsored by external funds (external to the scientific community), such as public funds, corporations, individuals, and so on. While using funds, a scientist would have responsibilities to an institution, government or the public at large that provide the funds. Because of this economic dependence on other communities, scientific activities cannot be isolated from the public, government institutions, or sponsoring corporations. As a result of these interdependence relations, it is possible that responsibilities to scientific community (the norms of the scientific community) may come into conflict with responsibilities to these communities (the norms arising from the membership relations with these communities). For instance, one of the fundamental internal norms states that the data obtained as a result of scientific research ought to be accessible to all members of scientific community (the norm of the accessibility of scientific data). However, a scientist working for or sponsored by a private company may be asked (or even forced) by the company to not release her data. Furthermore, scientists may also be forced to not share the results of their research because of national security, and for other reasons. These are violation of transparency, criticism, cooperation principles of science ethics. And in these examples it can be easily seen that scientists cannot simultaneously fulfill their responsibilities to the company, government and scientific community. So these cases show possible sources of conflict between the responsibilities of scientists belonging to different communities.

As for (ii), the restriction of scientific freedom as a result of external norms, it is possible that certain norms of communities other than scientific community may morally oblige scientists to do or not to do certain things that restrict their freedom but do not come into conflict with internal norms of science. A striking example would be the use of human beings and animal in painful or even fatal experiments. For example, Edgar Moniz was given the Nobel Prize for his invention of the lobotomy method ("a surgical operation on a part of the brain to treat pain or an emotional disorder" (www.indianpsychiatry.com/Glossary.htm) that he used on many people. But later, when people realized that this method changes people into a kind of zombie, the use of this method on human subjects was given up. As for

the use of animals, Pavlov's psychological experiments on dogs are a "classic." Although his experiments with dogs that were severely injured made important contributions to experimental psychology today such use of animals is considered inhumane by many ethic committees. According to my view, this use of human and subjects is not prohibited by the internal norms of the scientific community because the internal norms are indifferent to such cases for the obvious reason that the use of human and animal subjects has nothing to do with the sustainability of the scientific community in the strict sense and even favorable for the scientific progress. (Of course, I should point out that such uses may become part of the internal norms in the future as the internal structure of scientific community changes. This would not constitute a counter-example for my model because this model which is a dynamic model can admit of this and similar revisions in the internal norms.) Although this may sound to be an outrageous consequence of my model I should make it clear that I do not suggest human and animal subjects ought to be used in experiments. If we value animals and human beings more than we value such scientific research that may use animals and human beings as test subjects then we ought not to use them. However, it is true that the norms of science as envisioned by my model do not prohibit the use of animals and human beings as test subjects.

Finally, in case such conflictions arise, what ought scientists to do? The existence of certain norms of communities does not imply absolute moral obligation on individuals because these norms only indicate that they are necessary for the sustainability of the community from the structure of which these norms arise. The individual as a moral agent is obliged by these norms so far as she values the sustainability of these communities more than other values that she might have. In other words, the individual as a moral agent is free to choose those acts that she thinks right. The norms of a community are, in a way, objective norms that indicate how a particular community can be sustained and progress. An individual can be seen as a rational agent who develops her system of values independently of any communities. By definition, a moral agent is a subject who can choose among alternatives or even can refuse all alternatives. Of course a

moral agent will have to deal with the consequences of her decisions. In other words, my view of community ethics does not have to favor one particular ethical theory over other, or one particular set of norms of a community over others. My account of community ethics is *descriptive* not normative. I have endeavored to describe how ethical norms arise from community structure, the connection between these norms and the sustainability and progress of communities. To emphasize, arguing that there are norms of communities that are necessary for their sustainability does not commit me to favor one set of norms over others. Furthermore my account is dynamic in the sense that it admits of changes both in the interdependence relations among a community and its norms. Change in one may lead to change in the other. As H. J. Groenewold (1970) say,

> Moral rules may contribute to changes in the social environment. On the other hand, when changes occur in the environment, the condition for preservation of the group may require changes in the moral rules. …
>
> Under certain conditions moral rules may have a stabilizing effect, in case they counteract social changes, which are unfavourable for the group. A critical situation arises when the moral rules come into conflict with the preservation of the group. … [T]he social changes become so large and rapid that the moral rules lag so far behind that they are no longer adapted to the condition of preservation of the group. (p. 360)

CHAPTER 4

CONCLUSION

I have analyzed the conceptual and theoretical foundations of the community. I have also attempted to determine the basic characteristics of a human community. I argued that community members share certain features in common. I have put these features as having common purpose, common ends, and values, as well as responsibility, integrity, membership and so on.

By the inspirations of Leopold's understanding of ethics that, "Ethics are possibly a kind of community instinct in the-making" (Leopold, 1970, p.239) and Darwin's reflections in the "The Descent of Man" where he argues that ethics is a kind of social instinct (Darwin, 1998, p. 123), I have tried to identify a relationship between community and ethics. I examined the idea that ethics is a matter of social necessities and thus a result of social instincts and moreover, an inevitable result of socializing and living in a community. I attempted to justify it with the fact that living in a community requires limitations on freedom of its members.

Furthermore I scrutinized the claim that restriction (i.e. morality/altruism) on our freedom of action could have evolved and become inherited by every descendant by one of the key characteristics that play a crucial role in social life namely, human altruism. As a reason I suggested that whatever reasons a person might have for membership, selfish or altruistic, these reasons contribute to the sustainability of the social life and ethics.

Similar goals and beliefs, which require awareness of a unity and agreeing about being related to community, suggest an agreement about being supportive for each other, namely solidarity; and ideally a sense of responsibility which is reciprocal among members of a community. I endeavoured to display that this responsibility is motivated by *other-regarding* emotions—empathy, sympathy, justice, mercy etc. as well as collective benefits.

Darwin and Frans de Waal argued that roots of sympathy, caring and other sentiments exist in primates and big mammals and also that sentiments are the greatest evolutionary possibility for the origins of ethics. Darwin seems to claim the greater is the quantity of community members who possess *other-regarding* emotions, the bigger is the support and aid the individuals acquire. I also provided some examples from Darwin to show the parallel between the social changes and changes in moral norms in the history of morality.

I argued that scientific community seems to have all the characteristics of any other human community. Then I provided a historical perspective on the formation of scientific community in support of the claim that science evolved into a *socially organized and professional activity* of scientists since 17th century. This evolution has ended up with a unification of a single community, namely scientific community, with the scientific societies, journals and uniform scientific methodology. However, science that was, more or less, an activity of semi-isolated individuals before the 17th century developed modes of co-operation that created solidarity among scientists.

I discriminated competition, cooperation, interaction, competence, solidarity among individual scientists and integrity and stability of the scientific community as features of scientific community's internal structure. Furthermore, I examined whether the scientific community has a geniune ethics, problems, rules and solutions arising from its internal structure. I concluded that science ethics is inevitable, since it is a guarantee for the sustainibility of these internal features. So I distinguished some norms of science ethics (the internal norms) as willingness to criticism, to not fudge scientific data, to not mislead, plagiarise, to hide the source of citations and willingness to give a complete, right and full report of references that, I argued, prevent scientific community from dissolution to chaos and guarantee the sustainability of scientific community, thus science and scientific progress.

Furthermore I argued that there are also external norms (the norms of communities other than scientific community), which are not the norms of scientific community, may limit scientists and norms of science ethics. So that

scientists are not free of any constraint on their conscience inside or outside of the scientific community. I alleged that external limitations arise from the interdependence relations between scientific community and other communities that scientific community may intersect. I attempted to determine the relations between internal and external limitations and the constraints or norms arising from these interdependence relations. I tried to justify the claim that the norms of external ethics may limit scientific community in positive or negative sense. I contended that external limitations may have negative effects on scientific progress because they are not necessary conditions for the existence and sustainability of the scientific community. Internal limitations, on the other hand, always support scientific progress by backing the sustainability of scientific community and by supporting the fundamental community relations (competition, cooperation, and so on). In other words, scientific avtivity should be seen as a community affair that more or less determines both the freedom and responsibility of the scientist quo scientist

Moreover I pointed out that neither external nor internal ethics should have higher value a priori. I also emphasized the need for discriminating between scientific and public conscience. In the case of conflicts between internal norms of scientific community and the external norms of other communities (in virtue of the fact that scientists are also members of other communities and the scientific community intersects with other communities) the internal norms of science do not have priority over norms of other communities to which scientists also belong. An individual should be seen as a rational agent who can develop her system of values independently of any communities. For by definition, a moral agent is a subject who can choose among alternatives. As a conclusion, my account is dynamic in the sense that it admits of changes both in the interdependence relations among a community and its norms. Change in one may lead to change in the other.

REFERENCES CITED

Bhargava, R., 1998. Holism and individualism in history and social science. In *Routledge Encylopedia of Philosophy v.1.0.* London and New York: Routledge.

Buchanan, A., 1998. Community and Communitarianism, In *Routledge Encylopedia of Philosophy v.1.0.* London and New York: Routledge.

Callicott, Baird,. 1989. *In Defense of the Land Ethic*. New York: State University of New York Press.

Darwin, C. (1874), with an introduction by H. James Birx.— [2.nd ed.] 1998. *The Descent of Man*. New York: Prometheus Books.

De Waal, F., 1997. Are We In Anthropodenial? *Discover.* 18 (7), 50-53.

Dummett, M., 1981. Ought Research to be Unrestricted?, in R. Haller (ed.) *Science and Ethics.* Amsterdam: Editions Rodopi B.V.

Groenewold, H. J. 1970. Modern Science and Social Responsibility, in P. Weingartner and G. Zecha (eds.) *Induction, Physics, and Ethics*. Dordrecht-Holland: D. Reidel Publishing Company.

Humphrey, N., 1997. Varieties of Altruism and the Common Ground between Them. *SocialResearch.* 64(2), 199-209.

Johnson, D. G., 1996. Forbidden Knowledge and Science as Professional Activity. *The Monist.* 79(2), 197-217.

Leopold, Aldo,. 1970. *A Sand County Almanac*. New York: Ballantine Books.

Platon. 2004. *Republic*. (Translated by Benjamin Jowett, with and introduction and notes by E. W. Scharffenberger.) New York, NY: Barnes & Nobles Classics.

Ruse, Michael and Hull, David (eds.), 1998. *The Philosophy of Biology*. New York: Oxford University Press Inc.

Singer, P., 1996. Ethics and the Limits of Scientific Freedom. *The Monist.* 79(2), 218-229.

Smith, A. G. R., 1972. *Science and Society in the Sixteenth and Seventeenth Centuries*. New York: Science History Publications.

Snowdon, C., 1997. Nonhuman Kindness. *Science*. New Series, 276 (5315), 1088.

Tranöy, K. E., 1996. Ethical Problems of Scientific Research: An Action-Theoretic Approach. *The Monist*. 79(2), 183-196.