

## **Uses and representations of science and ICT in courts – interactions, mediations and ambivalences**

I have to make clear that what I will give you in this presentation are still preliminary findings and interpretations, based on the project “new technologies and magistrates: interactions, mediations and ambivalences”, of which I am the principal researcher, that is still in course, being undertaken at the University of Minho and funded by the Foundation for Science and Technology.

The project aims to analyze the transformations at the level of the daily judiciary practices caused by what has become known as scientific proof (by focusing the particular case of DNA typing) and by the use of the new information and communication technology (ICT), such as the use of personal computers’ tools, hence at the magistrates dispose, such as word processor, e-mail and internet and changes on trial’s social interactions, namely by the use of video conferencing during trials. Another relevant aspect of the presence of the ICTs under study is the perceptions about the possible impacts on citizen’s rights raised by the creation of information systems containing personal data (namely genetic information) used for justice administration purposes.

This presentation will focus on two different but profoundly interrelated themes: uses and representation of the forensic technique of DNA profiling and DNA databases and uses and representation of ICT at courts. Not only is DNA profiling seen with growing interest by law operators, but there has also been increasing interest in the new information and communication technologies at the service of Justice. Although the scope of application of these technologies is obviously different, one can find something in common, which became a rather interesting topic for analysis (at least from my point of view), that are the ideologies which promote both the widespread use of forensic proof (namely DNA profiling) and recourse to IT tools converge in the emphasis which they place on ever-increasing opportunity to improve the speed, quality and efficiency of the administration of justice and at the same time - and in particular in the case of the new information and communication technologies – the possibility of bringing the justice system closer to the citizens.

In my view this particular forensic technology – DNA profiling – along with ICT that can be used at the courts constitute some of the supports to the idea of «technological justice» - being as something transnational since the dominant rhetoric asserts the joint of justice, science and the ICT as something you can share and carry out and is “obviously” positive whatever the local distinctive features are both the legal systems and the scientific production.

Actually, not only science but also technology – especially the new information and communication techniques – are turning into one of the most powerful means of promoting the cultural globalization, namely by the political power and national governments. The trans-nationalization is no doubt one of the processes that better specifies the activities related to science and technology, which turn the discourses about “technological justice”, locally produced, to be strongly homogenous and indifferent to the national legal distinctive features. We propose a critical questioning about the “universality” of science and technology, stressing its vulnerability to contingencies supported by particular and local items standing in the way they are used in the courts context.

Most recent social studies on science and technology have consistently and systematically pointed to the need to view science and technology as “social products”, the use and resulting effects of which must not be understood without considering the ways they are used in the actions and representations of social actors. Thus, based on a study of the discursive practices of magistrates, I’m trying to understand the meeting points between “the culture of science and technology” and “the culture of justice”, in the uses of forensic science and of new information technologies in the courts. The hypothesis being developed is that the technologisation of the courts will have legal and social implications which intend to adapt to the implications of information age and of globalization, transjurisdictionality, and networked justice processes but which are profoundly constrained by localisms.

One of my assumptions is that the uses and representations of science and ICT in courts are not only embedded in the particular legal context but also invoke a variety of cultural repertoires, narratives, interests and values that project social visions which seem to be rather similar to the assumptions and beliefs about science and technology constructed by the common citizens in other contexts.

One very illustrative example of the some widespread and popular assumptions about the uses of science and technology in the administration of justice is that image that I found on an Internet site, provided by the legal Education Network from University of Pittsburgh Law School. “The next generation of leaders”, shows a picture with two men wearing suit and a tie and a woman on their side wearing a blazer (female appropriation of male cloths) that seems to display two messages (somehow implicit): the leaders of the future will be male actors (and female too if they shape their feminine appearance accordingly within a mainly masculine world), with law related jobs and that can easily use the more recent ICT.

Contrary to the old justice closed over it, preserving the old ways of doing and saying, the new justice – the global justice – widens to science and new technologies, even assuming its functional dependence and also its future survival on a good combination with them. Moreover, the incorporation of science and ICT seems to be something “impossible to fight against”. The symbolic effect involving science, technology and productivity is well known by the politicians: it was not by chance that one of the most remarkable aims of the political programme of the recently winner of the general elections, the socialist party (in Portugal) and that was indeed one the favourite slogans during the campaign, precisely the idea of urging a “Technological Shock” in Portugal. The technological revolution is considered to be the solution for some of the failures Portugal eventually shows up: inefficiency and low productivity.

Some authors have pointed out that globalization – and particularly EC integration – is contributing both to the corefication of the semiperipheral states (political level) and to the peripheralization of their economies (namely one what refers to productivity and integration of technology at the working process), What impacts are then being created on the justice system - known by the sluggish speed at which it worked, combined with its inefficiency and the excess of bureaucracy.

The Portuguese case will be here discussed based on the main assumption that the uses of science and ICT in courts reveal what some authors have classified as the semiperipheral or intermediate position attained by Portugal in the world system of science and technology – as I see it, this semiperipheral condition strengthens the presence of ‘trading zones’ and ‘boundary’ areas where the different fields of knowledge and statutes, of roles and competences meet and negotiate in order to function in ‘hybrid zones’. In a sense, Portuguese justice system has been «corefied» as

a result of the integration of forensic science and ICT in courts. But on the other hand, it seems that the justice system continues to be as semiperipheral as ever, even if the specific terms of this position are being restructured.

In Portugal the introduction of new information and communication technologies in the justice sector became a reality in 2001, when the panorama of “technological justice” was presented by the government as the most effective weapon in the fight against the sluggish speed of the system. An analysis of the government speeches of the time leads us to conclude that these measures were seen as a sort of miraculous cure for the most serious problem facing the Portuguese legal system - the sluggish speed at which it worked, combined with its inefficiency and the excess of bureaucracy. A lot was made of the fact that Portugal had implemented this ICT system in record time in comparison to other European countries, and of the fact that this was the largest ICT system ever implemented in Portugal. The government presented itself as the main mentor of the “necessary revolution” in the area of justice, by way of new information and communication technologies, in this unprecedented fight against the main troubles of the Portuguese justice system.

Information technology has begun to be presented by the governments of a number of countries and by some law operators as a panacea to the main ills facing the justice system – slowness and inefficiency caused by the “excessive number” of cases, which has become worse in recent times – as it is seen as being able to vastly increase productivity and quality, at the same time as reducing costs and inefficiency. Tony Blair’s government’s UK Online Project formally launched in 2000 is one of the most emblematic cases of political optimism in relation to the potential of the new ICTs. Although one of its main focuses is to prepare the UK for “new challenges” caused by e-commerce, the British government aimed to put government services on the internet, especially the justice system. This is where “virtual courts” appeared – courts/instances able to work linked up to the Internet, with email, and the use of digital transmission of images so that people could follow their cases online.

A Portuguese High Court judge, a well-known cybernaut, stated online in 1997 that: *“A lot of money was spent when computerizing the courts and nothing relevant happened; there were only a few and generally not updated, the software turned to be old-fashioned and difficult to use (...) I’ve spent a fortune to buy computing ware which*

*cannot be deducted from our taxes because the State is supposed to supply everything a Judge needs, so I can't present such expenses (...) many judges use a computer to process their texts, to do some legal research, to network and telecommunications, and that means that there is a reasonable set of computers in courts and actually being used. This way we are not very different from our American or Canadian colleagues. We are however different on the way we misuse the digital information because we do not organize or work it out and that causes a huge lost of efforts."*

This same judge made it clear, however, that *"Technology is a powerful tool but it is nothing more than that and will be of no use without the full involvement of those in charge and the motivation of the users (...) Judges, lawyers, other members of the legal profession will have to lead the process of technological renovation of the courts; if the effort of other professions, legal or otherwise, is added to this effort, it is possible that within a short period of time court cases could be heard in Portugal using the support of advanced technology. (<http://www.cidadevirtual.pt/asjp/ctc5/ctc5/html>).*

The views expressed by this member of the legal profession concerning the use of new ICT in courts highlight the role of "human capital", and present it as a crucial factor in the success of the process of the technological modernization of the legal machine. This does, however, presuppose the vertical, "top down", nature of the process, insofar as it emphasizes the role of the elites in terms of commitment and motivation and calls for the agreement and joint effort of all those concerned. We cannot but reflect critically here on the way technology can become ideological weapons in the hands of institutional leaders. As the latter play a vital role in the social legitimization of new ICTs, it is necessary to look at the different modes of action of the most powerful judicial agents, bearing in mind that, on one hand, there is no such thing as neutral, unbiased, impartial behavior and on the other, that it is through its symbolic dimension that the imaginary is constructed concerning the changes specifically associated with ICT.

Those among legal professionals and politicians who advocate a "more technological justice" point out as potential advantages of a wider use of advanced technologies in the areas of law of and justice the increased opportunity to improve the speed, quality and efficiency of the administration of justice and at the same time- and in particular in the case of new information technologies applied to justice – the possibility of bringing the justice system closer to the people. This is an "optimistic"

view of the effects on society of technological progress, counterbalancing the idea that information technology would lead to the elimination of excessive work and to the development of a genuinely participative democracy with the claim that these technologies could function as ideological weapons of the political and economic elite, becoming tools for increased social power and control over those most disadvantaged in society (Lopes, 2000). This view could also be said to suggest a type of “technological determinism” – as if the spread of technology happened alone (for example, creating the effect of increase of productivity and opening up new ways means of communication between citizens and the justice system) without it being necessary to ponder the different facets of the complex interrelation between technology, the people and the local and global constraints. This “internalist” way of seeing the effects of technology on society presupposes its own logic for technological evolution, independent of choice and social representation. The interactions between the social worlds of science and justice produce areas of interface and boundaries from which will emerge different knowledge and practices, which in themselves lead to a reconfiguration of hierarchies, roles and competencies which allow the social actors involved to function in these new hybrid spaces.

New ICTs are perceived as being able to change traditional court procedures insofar as, for example, they could increase the dependence of magistrates on computer operators, which would transform the balance of power ; or similarly, the use of technology such as video conferencing in trials would alter the traditional ways of interacting, which are strongly hierarchical and asymmetric, in other words, the preponderance of power of the presiding judge to establish the “rules of conduct” of the actors present, namely to the imposition of particular types of physical posture (such as being seated, bareheaded, and behaving properly). Even those magistrates, who are enthusiastic about the ICT at courts, are confronted with impediments to its usage, some of them grotesque, as one can verify in this description of a trial with videoconferencing:

*It is now the moment to inquire the witness... but I only could see her forehead because the screen of the computer was too low. The session is suspended in order to put three big books beneath the computer. The session starts again. On the other side the judge doesn't come up – he had give up waiting for us and was at another court session. I start using the microphone. “So, are you the only one who has the privilege to*

*hear the witness?!” – My colleague asks. We only had a pair of headphones! “Counsellors, can you see the witness?” – I ask. What a dummy question – we only have one screen which is turned to me! “Does the Public Prosecutor want to make any question?” “Yes, your honour, but how?” We only had one microphone – the one I was using. Everybody had to use «my» microphone which was a very hard exercise for the neck because the wire was too short...”*

There are only a few courts that have a homepage on the Net, and those which have one aren't updated. Besides, only forensic professionals can understand the language and even the online research of the legal materials is difficult. Sometimes, there are really unexpected situations such as when I researched for the court of law of Braga city and I promptly got a beautiful picture that I only thought I could find on a tourism site.

Among those who work in the judicial system there has arisen the idea that the use by the courts of technological innovations such as the Internet and e mail improves speed and efficiency of communication, and easier access to stored information, on the part of those both within and outside the legal system. However, critical reflection concerning access to “virtual justice” is imperative. Is it really true that the quality of citizenship will be improved (as the promise of more accessible, speedier and more efficient justice would suggest?) Will the democratisation of these effects be guaranteed? How will the technologically illiterate have access to “virtual courts” when it is a well-known fact that these are the very people who have the least access to justice in its more traditional forms? It may be taken for granted that the incorporation of ICT in Portuguese courts will be problematic and anything but straightforward. It is already known that organisational structures and procedures and the norms, beliefs and values in force in the institutional context play an important role in the use of technology, insofar as they mould people's perceptions of them – and their understanding of what these new information and communication technologies entail and their potential uses (Fountain, 2001).

On the other hand, our field research also identified a group of people who openly and critically distance themselves from the new technologies. This elitist attitude manifests itself as disdain for information technology, which is seen as something which, if used to excess, could undermine the nobler aims of the administration of justice or adversely affect the very specific ways in which courts are

run. This is an elitist, pessimistic view, of people who recoil when faced with the idea of technological tools which would make virtual courts possible. This distancing with regard to new ICTs stresses the specific nature of the work of magistrates, based on traditional ways of doing and saying, which do combine well with some of the limits imposed by the use of new ICTs. Among the most frequently mentioned examples are the various problems posed by to the workings of the judicial system by the use of electronic mail for communication during cases, and the various threats to justice caused by the indiscriminate use of technological tools, namely the intensive use of computer programmes to aid judges in reaching decisions

When it comes to the relationship of magistrates to these new technologies, a “generational” difference could be mentioned, based on the idea that the younger generations of magistrates would be more technically qualified and more inclined to accept this “new juridical culture” brought about by the information and communication revolution. However, some basic aspects of the relationship that the Portuguese in general have with science and technology should be considered. If on one hand, there is an attitude of respect and submission with regard to expert proof arising from revered areas of science, such as forensic biology, it is important to note that, to a large extent, underlying this credulity is a lack of information and ignorance on the part of judges, who admit that they do not have enough scientific knowledge to question opinion of forensic experts (Costa *et al.*, 2002). The distrust and scorn for the new information and communication technologies also reveals a lack of experience of the new technological tools and also strong resistance to changes in the traditional workings of the courts.

In our view, another important features if the transformations of justice system through science and technology relates to the so-called scientific and technological culture of the involved social actors, namely the magistrates.

The way that the public see science and new technologies and their real or potential uses would seem to depend largely on their social context in which they live and work. The first studies on the public’s scientific and technological culture was based on a what could be called a linear model of analysis, deriving from the clear assumption that there was a positive correlation between the level of exposition and technological and scientific literacy and the level of confidence and when faced with these technologies. More recent studies, in particular social studies of science, criticize this model, highlighting the fact that there is also – and sometimes paradoxically – a



positive relationship between the level of scientific and technological knowledge and critical awareness of the risks and potential problems that they may involve. The relationship that the more literate members of the public have with technology is not chaotic and unpredictable, but rather, a complex and heterogeneous group of practices and representations which follow individual interests, knowledge, and competences, which give rise to different ways of appropriating and using the concepts and tools provided by science and technology. Here “scientific and technological” overlap with “not scientific” and “not technological” (Nunes, 2000) In this way, both the perception and practice of science and technology can be permanently negotiated and reconstructed, and dynamically adapted to the knowledge and experience of a variety of social actors (Galison, 1996).

Focusing on the particular case of the use in judicial circles of a technology which nowadays enjoys greater scientific credibility – identification by DNA profiling - some studies point to the existence of an attitude of reverence and even of uncritical respect towards science and scientists on the part of Portuguese magistrates. This appears to be mainly based on lack of information and ignorance of the judicial decisions makers, who also admit they do not have enough knowledge to contest the opinions of experts in forensic biology. The relationship of magistrates with new information and communication technologies would, however, appear to be different. There are clearly two distinct positions. On one hand, there does indeed appear to exist, as has already been pointed out, a group of magistrates who claim to be comfortable with the growing use of IT in the courts - who could be described as the forerunners - who feel that, nowadays, it is becoming a vital element in the modernisation of Portuguese courts. They take it for granted that IT is a crucial for a true modernization of Portuguese courts.

One of the advantages of virtual justice that is most commonly stressed is the democratization of the relationship between justice and citizens, creating new forms of dialogue and interaction, thus preparing more demanding citizens with the legal system and making the professional transparency and responsibility more accurate. However we seem to have several forms of exclusion on the access to e-citizenship: on one hand the right of equal access to legal information, to the courts and to legal institutions in the context of ICT can exclude those who don't know or aren't able to explore all the resources required. On the other hand, we are aware of the exclusion of the judges

themselves, for instance, when observing the design of the software used by courts; non-available equipment or other necessary conditions, together with scarce periods of training available; some withstanding of legal culture that stands very much on the rituals of performances and on stability of knowledge.

At the same time that new scientific fields emerged or saw their development constrained in order to respond to the needs of the courts, new legal issues have raised as well as a growing body of law emphasizing the importance of scientific evidence within the legal process. It also transformed the way legal actors understand science, and raised some crucial issues regarding conceptions of rights and their reformulation in the areas of genetics and information. In the academic field, especially since the mid nineties, the social studies of science began to focus on the presence of genetics at courts, namely by developing a constructivist critical analysis which questioned the cultural authority of both law and science, henceforward seen as historically situated social activities. The social and academic debate on those topics, however, limited to the so-called adversarial judicial systems. However, it is necessary to broaden the discussion on other legal frameworks and juridical cultures – as is the case of the Portuguese legal system.

In countries such as the United Kingdom or the USA, the litigation process is almost entirely governed, in principle, by “adversarial” procedures – that is, each part has the opportunity to presented to the court the material on which it relies in support of its case, in form of evidence and argument and to test as thoroughly as it can the evidence and arguments presented by the other part. Forensic scientists, legal scholars and social scientists have pointed out that common law systems often give raise to an artificial polarization of the scientific issues in disputes, encouraging expert witnesses to ‘take sides’ (Oddie, 1991). But the adversarial proceedings have also contributed to construct and reinforce the scientific credibility of various emerging technologies. As Sheila Jasanoff argued, in the case of DNA typing, the adversarial process was both crucial and successful in exposing the unacknowledged and untested assumptions related to this technology, but also crucial to the process of assessing its scientific and judicial credibility (Jasanoff, 1997).

In Portugal, as in most “European continental judicial systems”, the rules of admissibility of scientific evidence and of expert witnesses are related to a distinctive

framework associated to some particularities of the inquisitorial legal systems. In fact, the judge has a rather active power in trial settings – he has a central predominant role in the examination process and in imposing the rules of evidence and of court procedures. The parts can make suggestions or even present their own experts reports, but it is the judge who decides which evidence will be admissible in court and who appoints the expert witnesses. The judge is considered to be the “expert of the experts”.

We also have to consider some specific traits being raised by the presence of genetic technologies in the Portuguese courts. In fact, the specificity of the judge’s role in the so-called inquisitorial judicial systems outstands how genetic expert reports are perceived by the magistrates as a type of evidence that is indeed on the track of absolute truth, or at least, as constituting all that is worth knowing in trial. In fact, unlike the adversarial legal systems, that relies on the clash of opposing viewpoints before a relatively passive tribunal that then adjudicates, the Portuguese magistrates actively inquire the parties in to the “factual truth”. Some authors stand that the latter judicial systems are more dependent on expert reports, perceived as the ‘rational way of going about things’, whereas the former seems to have little to commend it (Oddie, 1991) Still, as we have pointed that, the effective application of genetic evidence both in criminal as in civil cases, is strictly and criteriously controlled by the magistrates, according to their own subjective system of values that will define which are the cases that are worthy or not to accede to that kind of evidence.

The magistrates’ perceptions of science – in this case, of genetic technologies – might have a crucial impact on the configuration of the impacts created by this type of evidence on the administration of justice. By focusing on the on legal practitioners’ discourses, I aim to examine some of the issues raised by the incorporation of these scientific resources in judicial activity, as a social phenomenon located at the intersection of law, science, politics and public policy, regarding the landscape of legal systems of the inquisitorial type. Indeed, I believe that the magistrate’s discourses and perceptions of the potential uses of scientific resources to assist in court services can be quite different according to the framing legal culture.

How are the possible threats to constitutional rights arising from the use of scientific procedures - such as blood tests or genetic profiling, or the use of information

from genetic data bases - recognized and dealt with by legal actors? What other rights or duties are created or transformed in relation to the use of these scientific resources - such as the recognition of the right to refuse undergoing testing versus the duty of submission in the interest of justice or of third parties? In how far are basic notions associated with rights in the liberal tradition – like the notions of identity, personality, individuality, paternity, maternity, affiliation, and family – being transformed by the use of techniques of identification through DNA testing?

Are the interests and rights of the different actors involved adequately protected and the duties of the parties engaged in legal action properly defined? Have appropriate procedures for the resolution of conflicts that may emerge between researchers, society and State been created?

I've also tried to understand how legal and constitutional rights could be constrained, threatened, and modified, enhanced or even extended as a result of the growing uses of scientific evidence in legal settings. In order to explore this process of (re) configuration of citizenship associated with changes in legal practice influenced by the presence of scientific reports as pieces of evidence in lawsuits, I also asked the interviewees to discuss some of the issues related to how individual rights could be affected by the use of forensic medical testing - such as physical integrity or the protection of the individual's private life. The performance of forensic testing on a given individual, however, may be associated in a positive way with the rights of another individual - as is the case of blood testing or DNA profiling in paternity investigations. This may be regarded, on the one hand, as a threat to the physical integrity of the alleged father, but, on the other hand, as upholding the right of a child to his or her personal identity. In fact, some uses of science in legal settings have become a contested ground for different and potentially conflicting notions of individual rights.

A rather illustrative example of how tensions are produced between the science system which intends to be global and the judicial and legal frameworks that remain local, are the current trends for the the 'Europeanization' of DNA databasing in the form of an EU wide register. Some organizations, such as the European DNA Profiling Group (EDNAP),; the Standardization of DNA Profiling in the European Union (STADNAP) and also the European Network of Forensic Science Institutes (ENFSI)

have asserted the ‘need for harmonization of [the] technical and legal issues at the European level in spite of considerable heterogeneities of the cultural, political and legal conditions among the European countries, which are based on historical developments and a different national heritage in each country’. This drive for technological harmonization is fuelled by widespread police concern with ‘trans-national crime’, and the increased ease of population movement both across the EU and into the more ‘permeable’ states of the EU from the wider world.

As Paul Johnson and Robin Williams from University of Durham state in their report on the project *Forensic DNA Databasing: A European Perspective* funded by the Wellcome Trust (June 2004 to May 2007)”

However, there remain dramatic variations in forensic DNA databasing practice across the member states of the EU. There are differences in technical capacity, in state legislative support for the use of DNA in criminal investigations, in the frameworks for the conduct of these investigations, and in the prominence of wider ethical discussions of these practices (which include privacy rights, the nature of consent in relation to crime investigation, the confidentiality of genetic information, and the proper form of database governance)”.

The ambition of implementing a minimal universal standard of profiling so that individual profiles can be more easily be loaded and searched on a ‘global’ database is far from realized because local differences in profiling are extensive. Discrepancies between national legislation also produce difficulties for data-sharing given that the criteria for obtaining and retaining DNA profile, and thus making it available for submission to an international DNA database, will differ substantially between nation states. Finally, there are important ethical issues by the exchange of data across national boundaries. These issues relate to the ways in which, under existing arrangements for the exchange of intelligence material, tensions are created by both domestic and EU legislation designed to ensure data protection and personal privacy. In fact, the process of exchanging DNA profiles across national borders, means, inevitably, information deemed personal leaves the jurisdiction in which it was obtained. Concerns have expressed that when DNA profiles are submitted to police forces abroad there is little data protection legislation to prevent their unauthorized storage and use.

To conciliate rules and procedures in all European areas can produce tension between the presumed universality of the scientific culture, legal and ruling cultures of a national basis and the local conditions to proceed with the scientific and investigation practice. That conciliation of techniques and procedures has been damaged by the dividing line between scientific and legal cultures, which just stand next their boundaries, a science that tends to globalize and standardize and legal systems that keep their national and historical features. In order that the right to citizenship cannot be affected by the social use of science and technology, it's rather urgent to build up strategies of cooperation en both knowledge ranges and also sharing with the public the possibility of outlining strategies for regulating and introducing in the whole process the "profane" and local knowledge of those who are directly exposed to the consequences of the uses of the sciences and technologies.

An important feature concerning the presence of genetic reports in courts refers to the fact that some building blocks of rights as we know them in the liberal tradition, such as concepts of personhood, identity, privacy, physical integrity and parenthood, seem to have been affected by the presence of forensic science in the courtroom, at the same time that new rights emerged. Perhaps the most publicly contentious idea is the use of DNA on ID cards to prevent fraud and verify identity. But it is an unlikely scenario, at least in short time.

In 2003 the UK parliamentary Joint Committee on Human Rights argued that there is a 'risk that the databases might lawfully be put at the disposal of foreign investigators and intelligence agencies conducting speculative "fishing expeditions" in circumstances where the law governing the work of the foreign agencies requesting information offers little or no protection for privacy-related rights in relation to personal data held by public authorities. There seems to be also a lack of clarity in the allocation of legal responsibility for securing compliance with Convention rights.

Although in some core countries these issues have been at the heart of public debate, in Portugal, controversies concerning the performance of genetic testing and profiling on people and the possible risks associated with the uses of the information based on it seems to have been circumscribed to the worlds of law and science, and its resonance in the fields of regulation and policymaking has been rather limited.

The use of science in the public sphere – in the case at hand the courts of law -, namely the identification through DNA profiling in criminal investigations and in

paternity or maternity claims, has led to intense legal debate on the issue of citizens' rights concerning the performance of scientific testing on human beings. Several questions have triggered the debate in some countries. In Portugal, the public debate has been circumscribed (Costa, 2000), basically limiting itself to the legal field and, in part, to the scientific field. Some discussion is being promoted of general ethic and legal problems associated with the obligation to comply and to the refusal to submit to testing or profiling. These questions are being turned into fundamental issues for the construction of the future of citizenship, of the State and society's acceptance of responsibility for the paths taken by the scientific research in areas that can endanger the fundamental rights of the citizens.

One of the issues most discussed by legal scholars concerning the use of scientific testing on people in legal investigations has to do with the legal construction of the human body and the division established between "strictly personal" parts and products of the body – like blood – and "non-strictly personal" parts of the body – hair, fingernails and saliva (Oliveira, 1999).

Portuguese jurisprudence has been divided in the discussion about the legitimacy of imposing compulsory blood tests on investigations of paternity. One party defends that the refusal to submit to a blood test is legitimate, as it can be seen as an action that offends the fundamental right to physical integrity and to the protection of private life. The other party – the dominant one – considers this refusal illegitimate, though forceful submission to the examination is illegal. To impose the examinations by means of physical coercion would be a direct violation of physical integrity.

While the presumed fathers' refusal to undergo blood tests for DNA identification is benevolently accepted by the magistrates we interviewed (*"He has that right, you know? He may have an absolute terror of needles or for religious reasons he may oppose the taking of blood samples"*), the same does not happen where criminal investigations are concerned. In a crime situation, the interviewee's state that although the constitutional principle being discussed can still be raised, they know of no suspects that refused to undergo the medical examination. Apparently, the refusal to collaborate in an investigation of paternity is "less serious" than in that of a crime, despite the fact that the defence of rights other than those of the defendant guaranteed by the constitution is at stake in both cases: in an investigation of paternity, the right to the child's personal identity and to its own genetic information; in a crime, the victims' rights.

Besides the usual problems caused by the judicial imposition of exams on people, the study of DNA profiles raises other worries that have been underlined by legal doctrine, be it Portuguese or international, and that are related to the risk that these exams could be used to supply personal characteristics of genetic expression, which could be used institutionally or otherwise, beyond the identification of the examinee – information that is already provided by the traditional fingerprint databases (Oliveira, 1999). If databases with genetic information become easily available to official entities it would be tempting indeed to begin to systematically collect the DNA of every citizen or group of citizens predefined in some way (age, ethnic group, sex) with the objective – either explicit or not – of intentionally broadening the research beyond the investigation needs established by the law. The magistrates were questioned on the advantages and disadvantages of the use of a genetic database for criminal investigations. A significant percentage of them did not know of the possibility of using genetic profiles for the identification of criminals and none of them knew of any case in which this technique was used to identify crime suspects. The majority of the interviewees pointed out the danger of using this kind of information otherwise than in a criminal investigation and, in general, were suspicious of and unreceptive to this technique. This leads to the conclusion that the legal system is extremely conservative and that only after a certain scientific technique begins being used in several courtrooms is it accepted without reservations.

The ideological enfoldment of the courts uses of genetic information emphasizes the practical utility and large public benefits. However, the perception of the possible risks associated to this kind of systematic hoarding of genetic data triggered a legal debate on the danger of violation of the fundamental values of democracy, the safety of citizens and the respect for freedom and the exercise of fundamental rights constitutionally guaranteed. The problem is that this discussion - at least in Portugal - was not brought to the public in a dynamic, visible way, as it was done in other countries.

All in all, we are facing a scientific information deficit panorama as far as the actors of the judicial system are concerned (the majority of the interviewees never had any training in the sciences, not any information other than that received during their university years and in the training courses for magistrates). Besides, any dialogue between scientists, magistrates and citizens is quite limited. Bearing all this in mind, it



is foreseeable that there will be many obstacles in Portugal to a wide public discussion on the molecular genetic techniques and their uses, on how to regulate them and on the potential threats their unregulated use may bring to the citizens.