

Biometrics, and the body as information:

normative issues of the socio-technical coding of the body¹

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Systems of registration, censuses, and the like – along with documents such as passports and identity cards that amount to mobile versions of the ‘files’ [in Max Weber’s sense] states use to store knowledge about their subjects – have been crucial in states’ efforts to embrace their citizens (Torpey, 1998: 245).²

In a world of identity politics and risk management, surveillance is turning decisively to the body as a document for identification, and as a source for prediction (Lyon 2001: 72)

1. Introduction

‘Information’ and the related concepts of informatization and digitization were the buzz words par excellence of the late twentieth century – a fact that did not change with the coming of the twenty-first century. These terms are usually taken to signal a movement away from the physical to the immaterial, a shift in

importance, e.g., from material production to a service economy and information trade; from congested freeways and polluting transportation systems to the lightness of glassfibre communication networks and the mobility of frictionless electronic data flow. And on the level of personal identity, from the gravity of a needy, overdetermined bodily existence to the weightless mode of multiple virtual personae.

Writing out these contrasts, however, and even if they ring so many familiar bells, makes them recognizable for what they are: the cliches and rhetoric of hype. Of course material production has not in any way become less important to human existence, nor are the provision of services and the economic centrality of information in any way independent from material production. Similarly, the ubiquitous use of mobile telecommunication and electronic data exchange has not in any way contributed to a reduction of physical transport and travel, or relieved the environment from its polluting effects. We are all very much made aware of this every day and thus able to recognize the ideology of our times for what it is.

Although contemporary developments in IT bring along changes and transformations of many kinds, these are not adequately described nor understood in the simple oppositional terms referred to above. Worse than that, these very dichotomous ways of understanding both facilitate and obscure some of the more subtle, but nonetheless farreaching changes that are taking place. In this paper I want to focus in particular on the pervasive dichotomization of information and

materiality. More specifically, I want to address one particular instance of this dichotomy that seems to me to be requiring some rethinking: the dichotomy between embodied identity or physical existence on the one hand, and information about (embodied) persons and their physical characteristics on the other. I want to question in particular the presupposition that there is a self-evident, unproblematic distinction to be made between *'the body itself'* and *information* about, or digital *representations* of that body, in the context of the fast extending practices of registration and processing of digital data on physically identified individuals.

Today, the socio-technical production of social categories and identities through IT-mediated surveillance relies increasingly on a gradually extending intertwining of individual physical characteristics with information systems (Van der Ploeg, 1999a). The impetus for this development stems in considerable extent from governments and government related authorities facing security problems relating to processes of globalization and increasing mobility of persons. The apt metaphor of states' 'embrace' of their citizens in the quote from Torpey's *History of the Passport* preceding this chapter becomes particularly striking when 'the files' of which he speaks show the tendency to include ever more data pertaining to bodily characteristics. But it is in various domains of society and spheres of activity, ranging from work, healthcare, and law enforcement, to consumption, travel and leisure, that the generation, collection, and processing of *'body data'* is increasing (Lyon, 2001).

I argue that in order to make sense of the normative and socio-political implications of this phenomenon, we may need to let go of the idea that this merely concerns the collection of yet another type of personal information. Instead of consisting of mere information *about* persons, a proactive understanding of this development may be better served by considering the ways in which this ‘informatization of the body’ may eventually affect embodiment and identity as such. We may need to consider how the translation of (aspects of) our physical existence into digital code and ‘information’, and the new uses of bodies this subsequently allows, amounts to a change on the level of ontology, instead of merely that of representation. As Katherine Hayles writes:

When changes in incorporating practices take place, they are often linked with new technologies that affect how people use their bodies and experience space and time. Formed by technology at the same time that it creates technology, embodiment mediates between technology and discourse by creating new experiential frameworks that serve as boundary markers for the creation of corresponding discursive systems. In the feedback loop between technological innovations and discursive practices, incorporation is a crucial link.

(Hayles, 1992: 163)

Instead of the standard dual picture of the body as an ahistorical, natural entity, the representations of which change over time (due to scientific and technological innovations), we may need to consider how all three terms are caught in a process of coevolution: with technological and discursive practices converging towards an ontology of 'information', it is unlikely that their mediating link, embodiment - even while acknowledging its constraining and limiting power - will remain unaffected. And because embodiment concerns our most basic experience of the body and of being in the world, these developments carry profound normative and moral implications we ought to attempt to uncover.

Starting with biometric identification and verification systems, the next section describes a few examples of the variety of social identities being constructed and reinforced by digital registration and processing of individual physical characteristics. The third section describes several further examples of the informatization or digitization of the body taken from the contexts of medicine and forensics. In the fourth section it is argued that these technology-mediated practices, in which various aspects of bodily existence become integrated in information systems, taken together, signal the emergence of a new body ontology. Fifth, I discuss the significance of this phenomenon in relation to the normative concepts of 'privacy' and 'bodily integrity', and argue that these two notions are based on a body ontology that does not entirely match the currently evolving one. The final section tries to flesh out this abstract claim by providing

some concrete illustrations of this growing discrepancy taken from the legal discourse on bodily searches and DNA-banking.

2 Biometric identification technologies and social categorization

While primitive forms of biometric registration, mainly for administrative purposes, are known to have existed centuries ago, in modern times, the taking of fingerprints for identification of suspected criminals is by far the most well-known example of biometric identification. Today, the millions of fingerprints collected over the years in the USA, Europe and elsewhere for forensic identification purposes are being digitalized to form huge, increasingly interconnected databases allowing quick, on-line searches (Cole, 1998; 2001). The current capacity to identify a given fingerprint by comparison with hundreds of thousands, even millions of stored fingerprints is unprecedented in scope and speed. Thus forensic fingerprinting is rapidly moving beyond its classic function of connecting a suspect to a crime scene by matching a 'latent' fingerprint, i.e. a fingerprint found at a crime scene, to a suspect; with the help of the quick searches and comparisons of the fingerprints stored in central databases, the retrieval of a fingerprint may now actually *generate* a suspect.

Even though in public imagination fingerprinting is still firmly connected to criminality and forensics, this exclusive association is rapidly becoming obsolete. Worries about the 'stigmatizing effect' of fingerprinting have been laid to rest after the identities produced by the 'stigma' of the fingerprint diversified rapidly. From being a sign of criminality, fingerprinting is rapidly growing in importance as a tool in the perfecting of far wider range of social categorizations, including, for instance, welfare recipients, refugees and migrants. Fingerprinting has become one of the central technological aids to immigration and naturalization services, both in the USA and the European Union, in their efforts to control illegal immigration and deal with ever growing numbers of applications for political asylum. The INS in the United States has a system in operation called IDENT into which the fingerprints of every illegal migrant and asylum seeker are being fed. This system is hoped to be made compatible with that of the FBI, the largest fingerprint database in the country, as well as that of Customs.

Through a growing number of voluntary systems, fingerprinting is now becoming involved in the construction of the more positive, privileged identities of the law abiding citizen, the respectable client, cardholder, or club member as well. "Low risk" frequent travelers into the USA for example, can apply for inclusion into one of the systems designed to facilitate legal border traffic (INSPASS at airports, SENTRI or DCL at geographical borders). They then have to go through a background check that includes the routine taking of fingerprints, used for comparison with the FBI database, and stored in the INS system as well. The

programs themselves use hand geometry and facial photographs to identify the legitimate user of the accelerated processing on entering the country (Van der Ploeg, 2000).

Similar systems are in use in several European airports, while last year a central database containing the fingerprints of every person applying for political asylum in one of the European Union's member states - and those of every other person of 'irregular presence' caught on European territory as well - became a reality (Van der Ploeg, 1999b). The IND (the Dutch INS) at Rotterdam international harbor recently added to this an identification system of iris scanning of asylum seekers. "Regular citizens" will increasingly have biometric features used for identification purposes as well. During the development of a new Dutch passport the inclusion of a fingerprint as an additional security feature has been quite seriously considered, but was only in the end dismissed. Other public services and authorities increasingly look towards biometric technologies for identification of citizens as well. Obligatory fingerprinting of every person eligible for public aid programs has been introduced in Illinois, Texas, Arizona, and many of the other states are following suit. In The Netherlands, a similar experiment with welfare recipients started last year. In the same country, political negotiations are taking place about plans to redesign the infrastructure of all currently decentralized 'municipal basis administrations' (population databases) to render them accessible for a variety of central governmental agencies like the police, the internal revenue service and so on. Part of this plan is the idea to add a biometric identifier to

every personal file in these databases. In health care, the wide trend towards digitalization of patient records has yielded various systems that include a patient-held biometrically secured smartcard.

Next to these public service and administration applications of biometrics there is a broad trend in the worlds of commerce and work where improved methods of identification, authentication, tracking and logging are being sought after. The growing electronic mediation in these domains calls forth a feverish search for new ways to secure transactions of all kinds, be it telebanking, ATM cash dispensing, e-commerce, or the logistic management of goods, people, and data in offices, businesses and on the road.

The last example to be mentioned here is the extension of increasingly ubiquitous CCTV systems for crime prevention and surveillance of public spaces with facial recognition systems. The coupling of real-time video images to facial recognition systems and 'lookout' databases enables the automatic signalling of the presence of suspect individuals as they move through crowds and streets (Norris and Armstrong, 1999).

3 Other forms of digitization of the body

If our daily lives are going to show an increasing mediation of our identities (as workers, suspects, consumers, citizens, migrants, refugees, club members, welfare recipients etc.) through the interconnection of our bodies with information systems, we can add to this picture a couple of other forms of digitization of bodies. Two large domains that traditionally are concerned with the legitimate enrollment of individual bodies in the process of generating, storing and processing of (identifying, physical) information are medicine and law enforcement. In both areas, IT has been introduced with revolutionizing and fundamentally transforming effects.

In recent years, the computerization of medical records (EPRs, or electronic patient records) has become an area where the digital registration of information about individuals' physical existence has created an abundance of highly accessible (compared to the locally kept, often hand written, paper files to be replaced), sensitive, 'identifying' information. Health care systems throughout the Western countries are moving towards on-line accessible EPR's into which all data on medical history, medication, test results from a broad variety of diagnostic (often already computer based) techniques, and therapies belonging to a particular individual's medical biography are accumulated, and can be accessed by relevant care givers. Negotiations over design specifications are focussing on how broad the category of 'relevant care givers' to be given access can be defined, and to what extent administrative goals of billing, insurance reimbursements, hospital

management, and scientific research can be served by such records, without compromising what used to be known as ‘patient confidentiality’ and privacy too much. Such records, by virtue of the personal and unique nature of the information about an individual body contained in them, are in themselves extended forms of ‘unique identifiers’: obviously, every item added increases the unicity of the record. The connection of a record to particular individual can be established, besides through ‘classical’ personal identifiers like name, age, insurance number, etc, by biometric identifiers as well. Today several experimental designs of EPRs include biometric data as a means of connecting the record to the right person, thus simultaneously securing disclosure and limiting access to the sensitive, private information contained in them. ‘Genetic counseling’ and (pre- and post natal) testing for the presence of an ever growing set of genetic predispositions - the results of which to be stored on the EPR - adds to the amount of information about bodies ‘on file’ that is both ‘identifying’ and deeply personal. It provides the material for the generation of more information – about individuals, families and populations, about their histories as well as their possible futures, thus facilitating profiling and categorization into various risk categories.

Secondly, there is the set of technologies for which grand futures are being predicted deriving from genetics. Here the domains of forensic biometric identification and medical information come together: ‘genetic fingerprinting’ or ‘DNA-typing’ is rapidly equalling, even surpassing traditional fingerprinting in

providing ‘absolute certainty’ about identity in the legal context. Moreover, the enormous potential for improving law enforcement by collecting, keeping, and rendering accessible this type of data for future use has not escaped notice, and many countries are now creating databases with genetic identifying information about every convicted criminal subjected to providing DNA-samples in the course of a criminal investigation. The threshold for inclusion in these databases is lowered time and again, as for example in The Netherlands, where recently the criterion for mandatory giving up of DNA has been changed from suspects of crimes with 8-year sentences to those with 4 years. News media regularly cover stories about politicians proposing to sample the entire population whenever there is some spectacular crime shocking the public, or about medical institutions that, for years, turn out to have been routinely sampling DNA from every newborn baby coming in for their vaccinations, without even the parents knowing about it. Here, as elsewhere, technology is developing quickly, and beyond mere matching of DNA ‘fingerprints’, it is now becoming feasible to generate from the DNA sample the beginning of an actual profile (gender, ethnicity) of the person from whom the sample originates.

Although not commonly discussed in relation to biometrics – with the exception of DNA ‘fingerprinting’ – these practices do have in common with biometrics that they constitute digital representations of our physical or bodily characteristics as individuals in one sense or another. Moreover, precisely in that capacity, they all are functional in the construction and performance of our identities. The

transformation of various aspects of physical existence into digital code, field values, images, graphs and scores, imply endless possibilities for categorization. Stored, retrievable, and keyword searchable from many different locations, simultaneously or over extended periods of time, these ‘body data’ can become part of information processing practices in ways that were not possible before, or generate new practices altogether. The extensive potential for new forms of knowledge production, policy making and implementation, targeting, and the development of ‘prevention strategies’, is widely welcomed but will also give rise to new forms of surveillance that may not all be just benign. And, finally, there are many cross connections possible between the various domains in which these data are produced and used. Some of these connections are already realized, others are still mere technical possibilities; some are only phantasized about by over-zealous law enforcers, others may already be written down as future policy goals; some will be existing only in the fearful imaginations of Big-Brother-watchers; others may become reality faster than most of us think desirable.

4 The body as information

What all the above mentioned practices have in common is that in each one, (parts or aspects of) human bodies are represented in digital code, enabling new ways of

performing identities and embodiment. Through these partly connecting and overlapping technological practices, then, a new body ontology is emerging, that redefines bodies in terms of, or even as *information*.

The notion of body ontologies enables us to describe the way the human body is implicated in a process of co-evolution with technology - information technologies, but also surgical, chemical and genetic and visualization techniques, and combinations of these. Over the past century, various developments, mainly in medical science, have resulted in a set of body ontologies that are not based on the familiar anatomical-physiological ontology of the modern body, but quite explicitly construe the body in terms of flows of information and communication patterns. The endocrinological body, originating in the early twentieth century, for instance, knows the body as a biochemical entity, with an ontology of chemical substances that are characterized in terms of messages, signals, and feedback loops. Later, immunology – with a strong impetus during the 1980s from the AIDS crisis – construed a body that differed significantly from the anatomical body in its construction of body boundaries – the boundary between self and other - as the result of a fight going on *beneath* the skin. A discourse in many respects quite similar to that of strategic defense and warfare developed, based on a body ontology consisting of networks of communicative patterns between e.g. ‘T cells’, B cells, macrophages, and various mediating molecules such as lymphokines and antibodies (Haraway, 1991; Martin, 1992). The sciences and practices of genetics, finally, as already hinted at above, have generated a body ontology that takes the

building blocks of the body to *be* ‘information’: the human genome and DNA itself are codes to be broken in order to enable us to ‘read’ the *blueprints* of life’. The ‘stuff’ of genetics *is* information – no matter how this stuff can be described in biochemical terms of proteins, its ‘essence’ lies in its coding function.³

Thus, according to Haraway,

An account of the biomedical-biotechnical body must start from the multiple molecular interfacings of genetic, nervous, endocrine, and immune systems. Biology is about recognition and misrecognition, coding errors, the body’s reading practices (for example frameshift mutations), and billion-dollar projects to sequence the human genome to be published and stored in a national genetic ‘library’. [...] The biomedical-biotechnical body is a semiotic system, a complex meaning producing field [...].

(Haraway, 1991: 211)

Perhaps it seems somewhat counterintuitive to speak of new body ontologies, rather than mere changes in ways of representing and knowing the body: mere ways to talk *about* something that in itself is extra-discursive and remains unaffected. However, the fleshy structure bounded by skin, with an inside made up of organs, muscles, tissues, bones, and various fluids that appears to be the most likely candidate for such an extradiscursive referent, turns out, as the work of various historians of the body has shown, to be a particular historical invention

itself (e.g. Jordanova, 1989; Lacqueur, 1990; Duden, 1991; Schiebinger, 1993). This body ontology, in which anatomy, and somewhat later, physiology, provide the building blocks, has been quite precisely dated, and thus recognized as a contingent historical construction. The anatomical body as we know (and experience) it today, emerged in the late eighteenth century, when the practice of anatomy, that had been existing for centuries already, became coupled with the then emerging epistemology of experimental science, and a variety of new technologies of preservation and representation. A new body ontology came into being, that is commonly referred to as 'the modern body' (Foucault, 1975, 1979 ; Gallagher and Lacqueur, 1987). This body, laid down in the imagery of the anatomical atlas, became the ultimate reference for what gradually came to be experienced and acted upon as the very nature of our bodies (Hirschauer, 1991; Duden, 1991). This new body was subsequently performed through and in the fast proliferating practices, discourses, technologies and architectures of medicine, law, education, public policy etc., thus gradually altering the experience of being embodied in a fundamental way.

The interesting thing is, that even if there is a certain obviousness, or common sense logic, to equating 'the body itself' with the anatomical body constructed along the lines described above, the way this notion runs into difficulties in certain contexts shows that it is not the unproblematic, natural prediscursive referent it is often supposed to be, but a particular construction, a specific body ontology, ultimately sustained by pragmatic and operational definitions. The co-evolution of

various information technologies and bodies observable from the examples discussed above generates confusions, casts doubts, and generates needs for explicitation of issues previously considered self-evident.

This comes to the surface in particular when normative implications of contemporary technological developments are considered. The growth in generation and processing of 'body data' regularly generates public controversy, for the recognition of the enormous potential for 'misuse' of these types of information is widely shared. In trying to draw lines, and separating legitimate use from misuse, concepts and values are invoked and applied in contexts and discursive spaces they were not invented for. The ensuing discursive exercises sometimes reveal how the ontologies implied in these concepts and values do not entirely match with the informatization and digitization processes currently evolving.

5 Normative concerns: 'privacy' and 'bodily integrity'

Predominantly, normative concerns are couched in terms of potential violations of 'privacy' - a fundamental, albeit not in all countries constitutional, legal and moral right. Data protection regimes such as laid down in the European Directive

on Data Protection (European Parliament and Council, 1995) are morally and legally underpinned by reference to rights to privacy. The object of protection then is ‘personal data’, that is, data pertaining to an individual in such a way that they are ‘identifying’.⁴ The kind of privacy involved, then, is *informational privacy*, which is defined in the ethical and legal literature as having control over one’s data.

Speaking about the (sometimes forced) integration between bodies and information systems, however, the more fundamental concept of bodily integrity appears relevant as well, and occasionally this possibility is considered. Yet, in relation to the generation and storage of digital representations of individual bodily features, its relevance is considered, if at all, in a very restricted way. It is generally perceived to be at stake only in the context of the *generation* of body data as ‘input’ for the IT systems.

For example, in the context of biometric identification schemes, bodily integrity is discussed only with regard to the material contact between fingertips, hands, eyes and the various sensing devices used to generate a biometric– and subsequently quickly dismissed (e.g. Kralingen et al., 1997). In the contexts of law enforcement and forensic identification, however, with their longstanding traditions of ‘frisking’, fingerprinting, and today, DNA typing, and various other forms of bodily searches, it is considered quite clear that bodily integrity is indeed at stake.

Most countries have quite circumscribed laws and rules pertaining to ‘bodily searches’ in order to protect the rights of individuals against the powers of the state and its law enforcement branches. These rules specify under what conditions (strength of suspicion, severity of the suspected crime) a person can be required to provide fingerprints, bodily tissue (blood, hair, saliva) or cooperate in the procedure of procuring such materials. If consent is required, rules are in place what exactly a given consent covers; if forced searches are allowed, specifications are usually given about who may perform the search (medical training, gender).

Similarly, the concept of bodily integrity is a normative notion quite central to normative underpinnings of medical practice and science. The contours of the discussion of bodily integrity in the medical context of generation and storage of information about bodies, however, parallel the set of patient rights as laid down in ‘informed consent’ requirements pertaining to medical interventions. That is to say, bodily integrity is protected as far as the performance of tests, the procurement of ‘test materials’, or the conducting of experiments, require physical intervention. The results of these medical proceedings – today often in the form of computer generated, processed and stored data - are considered as ‘personal information’ deserving protection for privacy (patient confidentiality) reasons.

Thus, everything beyond the actual touching and procurement of materials to produce digital representations - be it biometric templates, EPRs, CT-scans, genetic profiles, or digital images of fingerprints - is thought of in terms of

(sensitive, personal) *information*, a concept that rather equalizes and flattens further distinctions. There is ethical or legal difference between these types of information and classic forms of *personal data*, like, for example, proper name-address-age-gender, religious background, video rental records, or income tax files. The only distinction used is that between personal or identifying data and non-personal or anonymous data, a distinction that in itself is not an intrinsic characteristic of the data themselves, but, arguably, a function of its relation to other data (Panel on Confidentiality and Data Access, 1993).

Thus a specific ‘division of tasks’ exists that reflects a particular ontological dichotomy: bodily integrity applies to ‘the thing itself’, whereas informational privacy is presumed to cover all (digital) ‘representations’ of it. The normative relevance of this difference is clear: in our current moral and legal cosmologies, far less stringent criteria apply for what counts as a legitimate violation of privacy, compared to what is needed to justify a breach of bodily integrity.⁵ So, if the underlying ontology is gradually changing through processes of informatization, digitization, and the various new forms of constructing, performing and manipulating the body these transformations allow, and if because of that the presumed demarcation of where ‘the body itself’ stops and begins being ‘information’ will subtly shift, the moral and legal vocabularies available will not suffice any more.

6 Bodily searches: Body boundaries, information, and integrity.

Our current concept of bodily integrity, even though it can be a basically felt and psychologically experienced moral value, functions predominantly in the discourses of law and rights. But even there, it is mostly used as an unquestioned and unquestionable value to which in last instance can be referred, rather than being the object of explicit deliberation and definitional exercises itself. There are a few contexts, however, in which the suggestion of self-evidence regarding the question what constitutes the body and its boundaries whose integrity must be protected is lost, and debates and definitional exercises ensue. In these instances it becomes clear which body ontology underlies the right to bodily integrity, and significantly, how it runs into trouble.

For our current purposes, legal debates over ‘bodily searches’ (the rekindling of which today is largely due to the development of DNA-profiling and banking) is highly relevant and instructive. Even though national differences abound here, in many, specifically West-European countries, upholding a distinction between searches *on* the body (“frisking”, searching of clothes, skin, fingertips, face) and searches *in* the body is deemed crucial, suggesting that there is a self-evident body boundary that determines the normative and legal weight of a particular search (Ippel, 1996; Tak 1990).

‘Integrity’ becomes an issue when insides are involved, and boundaries compromised. Pricking through the skin with a needle to draw blood, for example, though not severe, and often routinely justified, as for example in traffic alcohol tests, is in principle a violation of the body’s integrity. However, this seemingly clear-cut boundary, appears far less evident when a more detailed explication is called for. To begin with, natural openings and orifices form an obviously problematic grey zone acquiring much attention and thought. Generally, searches of ‘the natural body openings’ fall within the category of searches *on* the body, although in Dutch law a further distinction is recently introduced between body openings of the upper and those of the lower body half, because of the ‘burdensome nature’ of searches of the lower body half, both to the searcher and the searched – an example of the way the criterion based on a presumed natural body boundary needs to be supplemented time and again by wholly different types of criteria; here, one that refers to a subjective experience of embodiment.

To our purposes here, however, another additional criterion is even more interesting. X-ray photographs, for instance, are quite hard to categorize in terms of an inside and outside of the body, for there is no actual touching of the body involved. They score high on the legal scale of relative invasiveness of forced searches, but it is quite unclear whether this is on account of the X-rays being sent through the body, and the health risks this involves, or because of the fact that the resulting picture constitutes a representation of the inside of the body. There is

also a general consensus among legal experts that the taking of a DNA sample is to be considered a most serious breach of integrity of the body, even though there are several ways of obtaining a DNA sample that are hardly noticeable to the person involved, and, certainly compared to many traditional kinds of searches, do not in the least appear 'burdensome'. According to Van Have & Welie (1998), the reason for this is that such searches do not have as their goal finding traces or objects related to a crime, but *generating information* about the identity of the person. It is this difference in *purpose* that renders the taking of a saliva swab from the inner lining of the mouth a far more serious breach of integrity than, for example, a search of the lower body openings to find some smuggled drugs. Clearly, in clarifying the legal and normative status of such searches, a simple reference to a boundary between the inside and the outside of the body has been given up, to allow space for the criteria of purpose and subsequent use of the body data.

The inability to distinguish between 'the body itself' and 'body information' also explains to considerable extent why the efforts to deal with the issues of DNA sampling and banking of genetic information run into so much trouble and controversy. There are several ways of procuring DNA samples that by all traditional standards would hardly count as a breach of physical integrity. Here it is clear that it is not the actual touching of the body, or crossing of the anatomical-physical boundary necessary for generating the data that accounts for all the fuss. Its meaning as a breach of integrity does not lie there, but, obviously in

subsequent use of the information thus acquired. Focussing on the act of generating the data, in this case, obscures its significance. Much of the discussions surrounding these databases center around the questions what exactly should be filed and stored, be made accessible to whom, and for what uses. If, for example, the DNA samples themselves are also kept, it will be possible to subject these samples to further analysis in the future, thus adding to the mere 'fingerprint' whatever medical-genetic information may be derived from whatever (future) technique will become available. There are immense differences in potential to generate information from DNA samples, or DNA records, and within the latter, between STR profiles or complete genetic profiles, between (what are today believed to be) medically non-coding polymorphisms, and (what are today known as) 'health-related loci' (Kaye and Imwinkelried, 2000) And, as can be inferred from the remarks between the parentheses, these qualifications may not refer to static characteristics. They are relative to the state of knowledge and technology at a particular moment in time – the enormous effort that today is being invested in the further development of analytic techniques and the 'decoding' of the human genome may change such premises in years to come.

The relationship between bodily matter and bodily information, on which the demarcation between the rights to bodily integrity and informational privacy is based, when it comes to genetics and DNA, cannot be adequately understood as a boundary between the thing itself and representations of it. There is no clear point where bodily matter first *becomes* information. The 'essence' of the stuff of DNA,

both the reason of its scientific isolation in the first place, and, in watered down version, its forensic significance, is precisely that it *is* ‘information’.

There are, of course, many forms of searches where the act of generating the information, and the concomitant violation of anatomical-physical body boundaries is indeed what *should* count. Similarly, many body data generated in the medical context *are* the result of elaborate, invasive procedures and diagnostic techniques; here the encounter between bodies and information generating technologies is more often than not quite painful, risky or otherwise costly to the person. And if one considers the difference between, for instance, surgically opening the body to gather information about the condition of some organ and gathering the same information by a CT-scan, it is obvious that this difference is extremely significant; moreover, to express this difference, the notion of bodily integrity is indispensable and must not be deconstructed lightly.

But how should we conceptualize a police search or a medical examination of the body-as-information, a virtual body? The concepts of ‘privacy’ and ‘data protection’ are too much in collusion with the very informatization processes they are supposed to set limits to. To say that the use of body data merely involves the data or the information, and not the body, or the embodied person themselves, denies the constitutive and enduring relation between the data and my identity as embodied person. If the bits and pieces of stored information about my life and behavior as citizen, consumer, worker, my ‘digital persona’ (Clarke, 1994), are in

a sense constitutive of, and inseparable from me as a person, then the inclusion of body data to this digital biography is similarly inseparable from my embodied identity. Acknowledging this relation by proclaiming body data ‘private’ or ‘worthy of protection’, just like any other ‘personal data’, goes some of the way, but does not exactly do justice to the fact that embodiment is central to individuality and identity in a way that my social security number, or my car rental records are not. It may quite reasonably be expected that these changing practices of dealing with bodies will have some profound transforming effects on the level of embodiment, just like the late-eighteenth century emergence of the modern, anatomical-physical body did during the century that followed it.

If it is already recognized that the severity of breaches of bodily integrity in the context of police searches may lie not just in the physical invasion of body boundaries, but also in the purpose of information gathering about a person’s identity, then it is highly relevant that the tremendous impact of today’s technological developments on law enforcement capabilities relates precisely to this purpose. The capacity of certain technologies to change the boundary, not just between what is public and private information, but on top of that, between what is inside and outside the human body, appears to leave our normative concepts wanting. The new, intensive forms of monitoring, categorizing, scrutinizing and, ultimately, controlling and manipulating of persons through their bodies and embodied identities that become possible in this new ontology suggest that some form of integrity of the person may be at stake. Maybe not exactly ‘bodily’

integrity in the traditional sense associated with anatomical-physical body boundaries, but a form of integrity yet to be defined. Especially since the gathering of body data, including even DNA samples, becomes ever more easy, inconspicuous, inescapable, and ubiquitous, it seems a bit like ‘ostrich-policy’ to remain focussed too much on body boundaries belonging to the ontology of anatomical-physical bodies, rather than redefining some concept of integrity adequate to the ontology of informatized bodies.

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² Thanks to Elia Zureik for pointing me to this extract.

³ It may be important to stress here that these phenomena are not mere metaphors used in popularizations of science, while the 'real body' to which such descriptions refer remains unequivocally anatomical or physiological. Whereas it is indeed the case that metaphors are involved here, they can be found in the most 'serious' scientific descriptions as well. Such metaphors do not refer to other more literal concepts, but are the very stuff of scientific

imagination itself. What may start out as metaphorical - meaning carried over from another context of use - after a while becomes the literal. (Rorty, 1989; Locke, 1992).

⁴ "personal data" shall mean any information relating to an identified or identifiable natural person ("data subject"); an identifiable person is one who can be identified, directly or indirectly, in particular by reference to an identification number or to one or more factors specific to his physical, physiological, mental, economic, cultural, or social identity." (European Council, 1995, p.10)

⁵ Although bodily integrity in many legal systems is conceptually subordinated to a more general concept of 'privacy' or 'private life', that is, it is often defined as a special subcategory of a general notion of privacy, it is also generally acknowledged as morally and legally constituting privacy's most basic instance. The contrast between the two ethical/legal regimes I'm drawing out here is therefore not that between bodily integrity and privacy as such, which is a very broad and loosely defined encompassing concept, but that between 'bodily integrity' and 'informational privacy'. I argue that our concept of bodily integrity is too narrow to deal with the broad technology-mediated transformative processes in which our bodies are currently caught, and that it is too readily assumed that mere 'information' or 'data' is at stake, however strongly the 'personal' or 'sensitive' nature of this information is stressed, and however stringent data-protection regulations may be defined. Both with respect to the necessity and the justification of protective measures, there is a morally highly relevant difference between the definition of the object of protection as 'identifying data (about the body)' and our personal bodily existence as such.