Christina von Braun, Knowledge and the Body

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If it is true that the body is a cultural construct, then it represents one of the brashest scientific fictions of all time. As in the case of literature and the fine arts, theories of the body reflect the desires of their respective ages. However, in contrast to works of art, these theories masquerade as knowledge, even though the mutability of ideas about the body betray their fictive nature. One can see this most clearly in the theories and images of the gendered body, which are redefined from one period to the next and nonetheless presented as unalterable biology. Today, women make up about half of all university students and work as professors and researchers. However, examining the debate on the admittance of women to the university and institutes of higher education around 1900, one would have to conclude that the female body has undergone a radical mutation over the past one hundred years. The opponents of female enrollment formulated arguments based not on a cultural codification of femininity, but on the biological and supposedly unalterable nature of the female body. This group, which even warned of the dangers of hereditary damage,[1] included some of the most eminent scientists of the age and specialists from a wide range of disciplines—not only theologians and historians, but also physicists, doctors and biologists. As one can see in retrospect, their arguments, though powerful and persuasive to their contemporaries, were based on "imagined" certainties and thus a blurring of the boundaries between science and fiction. Even so, if some of the world's greatest scientists were blind to the cultural codification of the body a hundred years ago, why should we believe we are more enlightened today? Is the border between science and fiction really so clear?

The cultural codification of the body, which can be interpreted as reflecting the desires of each age, influences the behavior of the "real" body. This is one of the reasons that these desires are so difficult to recognize as such, and that science can claim that it only "reads from reality" in its research into the human body. However, if one compares images of the collective (or social) body with those of the gendered body, it becomes evident that both are subject to a similar mutability. The social body is indisputably an imaginary construct: a *corpus fictum* or *imaginatum*, as theologians once referred to the Church, or jurists to the state.[2] Through the analogy to the human body, the imaginary social body attempts to create an impression of indivisibility and corporality. The collective body makes use of the individual body as a reflection, and since images of the *corpus fictum* change from one era or culture to the next, so too do the associated medical, biological and legal concepts surrounding the organic body.[3] The concepts that shape the image of the human body matter greatly to the social body precisely because it is highly dependent on the analogy to the individual human body and bases its claim to represent reality on it. As a consequence, knowledge of the "the body" is determined by the concepts that the social body forms of itself.

The changeable images of the *corpus fictum* are for their part closely linked to the media technology of a given age, which in turn influences the nature and form of knowledge. This is shown by images used

to depict the function of the human brain. When electricity was first discovered, brain activity was likened to an electrical network with power surges; this explanatory model was then replaced by that of the telegraph network, only to be followed by the computer. Modern brain research currently favors an Internet analogy. By influencing collective memory and decisions about what is worth knowing, communication channels, transmission mechanisms, as well as storage and reproduction systems determine the manner in which the collective functions as a body. This is an interactive process: the fictive social body invents technologies that shape important aspects of the collective (e.g. consensus building) and knowledge. These aspects, for their part, inform the specific image of the *corpus imaginatum*. In addition, the human body, in which the collective body seeks to be reflected, is subject to the magic of the social body. This does not necessarily mean that the organic body is all smoke and mirrors—it is this too, perhaps—but rather, that its explanatory models create ever-changing, culturally coded images.

One such coded image is the idea that the head rules the body—a concept first employed by St. Paul to illustrate the relationship between Christ and the religious community. “Because the loaf of bread is one, we, though many, are one body,”[4] he says. In another biblical passage, St. Paul describes pious individuals as “limbs” who form one indivisible body in Christ,[5] with Christ defined as the head of the community.[6] This imagery was adopted by the Crown’s jurists to describe the relationship between the sovereign and his kingdom. “It is evident that the doctrine of theology and canon law, teaching that the Church, and Christian society in general, was a ‘*corpus mysticum* the head of which is Christ,’ has been transferred by jurists from the theological sphere to that of the state the head of which is the king.”[7] Finally, this image was sexually coded in a manner that promoted its “biologization”: just as Christ was seen as the bridegroom of the religious community, so too was the bishop, at his ordination, made the *sponsus* of the Church. The ring he slipped on his finger sealed the marriage.[8] In the Late Middle Ages, this rite was made part of the king’s relationship to his kingdom. At his coronation, the king was named the husband of his kingdom, the *maritus rei publicae*.[9] Moreover, this corporeal imagery, which was directly adopted from the relations between the sexes, influenced the roles men and women assumed in matrimony. St. Paul writes that, just as Christ is the head of the Church, so too must the husband be the “head” in marriage, and the wife his body. St. Paul even demanded: “So ought men to love their wives as their own bodies. He that loveth his wife loveth himself.”[10] Incidentally, this image of the head that marries its own body is probably the most vivid illustration of the Christian belief in the indissolubilty of marriage as inviolable law, unique among the world’s religions. The educators of the Enlightenment also endorsed this matrimony model: in 1774 Theodor Gottfried von Hippel wrote of marriage: “The husband must rule over his wife as the soul over its body.”[11] The scientists and scholars who disapproved of female enrollment at universities equated masculinity with intellect and soul, and femininity with corporality. For them, an originally “symbolic” or cultural codification became “natural law,” and for this reason they focused not on the head, but on the lower abdomen of women in their arguments. Only in the early twentieth century did the physiologist Walter Bradford Cannon and a few other scientists draw attention to the erroneousness of this basic analogy. According to them, the organic body was not organized according to the principle of a head that gave orders to the body’s limbs and organs; it was based on what Cannon called “homeostasis.”

In this conservation model each organ is dependent on the function of the next, and all work together to promote circulation of the body's energies.[12] Cannon wanted to apply this principle to society—that is, to the social body—and offered a more modern analogy, this time comparing the physiological body to the body politic.

The Interaction of the Corpus Fictum and the Organic Body

The history of marriage imagery and its power to affect both marital relations and the behavior of the human body clearly demonstrate the interrelation between concepts of the collective body and scientific concepts of the organic body. This interrelation can be seen in other fields as well. In *The Leviathan*, published in 1651, Thomas Hobbes uses imagery of the social body that has clear Christian origins, focusing on a modern form of the *ecclesia*. This term, which stems from Greek, signifies something akin to a political community and was first employed by St. Paul to designate a religious community. It thus had a secular dimension from the very start. However, Hobbes's concept of the social body differs from that of the Church or the Crown in one central point: he foregoes any analogy to "head," to sovereign, or to the "the king's two bodies." This is no surprise, since Hobbes had the misfortune of experiencing the execution of the English king "in the name of the **king**" as a result of a civil war between king and parliament that was triggered by a conflict over control of tax revenues. Hobbes came to the conclusion that the collective should be ruled by a sovereign or an assembly that wielded sole authority, and that this system was only possible if the social body became a real body, i.e. if the *corpus fictum* became a *corpus verum* of organic flesh and blood. Such a transformation presupposed the total subjugation of the individual. Hobbes accorded the individual neither freedom of religion nor freedom of conscience, since he saw within **them** the seeds of disunity. As a result, in Hobbes's *Leviathan*, the idea takes shape that the collective only emerges when individuals fuse to form a single body—a concept that made the king's symbolic body and unifying representation superfluous. But what forces hold this body together? Hobbes lists a few, including money, which he, interestingly enough, compares to the circulation of blood. In doing so, he emphasizes the corporality of the collective. Money circulates "from man to man within the commonwealth," and in circulating "nourisheth" every part it touches:

". . . in so much as this concoction is, as it were, the sanguification of the Commonwealth: for natural blood is in like manner made of the fruits of the earth; and, circulating, nourisheth by the way every member of the body of man. . . . And in this also the artificial man maintains his resemblance with the natural, whose veins, receiving the blood from the several parts of the body, carry it to the heart, where, being made vital, the heart by the arteries sends it out again, to enliven and enable for motion all the members of the same."[13]

There can be little doubt that William Harvey's discovery of the circulatory system just a few **decades** earlier (1628) played an important role in this analogy. Its influence alone reveals the interrelation between the *corpus imaginatum* of the social collective and knowledge of the organic body. At the same time, though, the passage clearly integrates Christian imagery of the community-building function of blood (the jointly consumed blood of the Savior at holy communion, which establishes a community of the pious before God). Based on this imagery, Hobbes is able to conclude that the state

is but "*one* person" and it "ought also to exhibit to God but *one* worship."[14] The host—with its **miraculous** capacity to transform symbol into flesh and flesh into symbol—can be viewed as a stand-in for the coins (i.e. money in circulation) that transform goods into signs and demonstrate the proximity of *credo* to credit.[15] Hobbes was undoubtedly more of a skeptic than a believer, and his declared belief in one God probably owed more to convention than conviction.[16] Yet in many places he avails himself of Christian imagery, transferring it to the sphere of the state so that he can speak of a natural kingdom of God. This is also the case in the chapter "Of Miracles and Their Use," in which he compares the power of the sovereign to the unconditional belief in the miracle of transsubstantiation:[17] "For example, if a man pretend that after certain words spoken over a piece of bread, that presently God hath made it not bread, but a god, or a man, or both, and nevertheless it looketh still as like bread as ever it did, there is no reason for any man to think it really done, nor consequently to fear him till he enquire of God by his vicar or lieutenant whether it be done or not . . . . If he say it is done, then he is not to contradict it."[18]

The authority by which the host is declared to be a real body corresponds to the power by which the ruler sets the value of a coin. This means that money—as a medium and sign system—is overlaid with imagery from physiological research and is thus lent the illusion of corporality, which in turn has repercussions for the way the individual body or its illnesses are conceived. The idea of a social circulatory system was especially powerful in this regard, producing the modern secular images of the "popular body" and blood community that arose with such virulence in the anti-Semitism of the nineteenth and twentieth centuries. The concept of the blood community corresponded to illnesses involving "poisonous" or "bad" blood that were thought to cause infection, not only in the social body, but in the individual body as well. One example is the concept of miscegenation (*Rassenschande*) found in publications such as Artur Dinter's *Sünde wider das Blut.*[19] Naturally these were pseudo-scientific works, but this did not diminish their effect. People believed in the power of "poisonous" Jewish blood, and such ideas pervaded the myths revolving around syphilis, a very real illness for which no cure was found until after 1900 (salvarsan and penicillin). Even though syphilis was known to be transmitted sexually, it was nonetheless charged with mythic ideas of "bad blood" that had their roots in Christian traditions on the one hand and ideas of "bad" or counterfeit money on the other.[20] "Bad blood" imagery was also used to characterize social conditions: Richard von Krafft-Ebing coined the term "syphilisation"—later a favorite among anti-Semites, including Hitler, who applied it to the much-despised Jewish and Anglo-American culture as compared to that of Germany.[21]

The Collective Body as a "Nervous System" and the Organic Body

An additional collective body concept caught on in the 19th century, one that was primarily based on media communication:[22] that of society as a nervous system. Today this has become the predominant metaphor for the social body, whether on a national or international level. On the international level, the nervous system imagery is used most frequently in conjunction with the Internet or the stock market, which is played around the world; or in connection with the term "globalization," whose

invisible links create the impression of a vast communication network spanning the diverse regions of the globe. After the sarin attack in Tokyo in 1995, the German public broadcaster ARD aired a special news show whose introductory film illustrates the concept of the collective body as a nervous system: "Tokyo's subways are safe and fast, ticket inspectors are unnecessary, hooligans and graffiti artists are unknown. Eight million commuters travel back and forth from the suburbs on a daily basis. Twelve subway lines, the nerve fibers of a highly specialized system . . . . The sites of the attacks, encircling the city center and the royal palace, reveal the systematic nature of the crime. The attack . . . targeted one of the most secure cities in the world. . . . Tokyo with its lack of space can only survive through social consensus. Even the daily chaos on the streets appears ordered and is borne collectively . . . . There are hardly any ideological conflicts and generally people exhibit a strong sense of responsibility. This is the reason Japan has previously been able to do without rigorous security measures in public spaces; video surveillance sufficed. According to Shintoism, anyone who violates social taboos or commits a crime flings dirt upon his parents' faces. This religious doctrine is probably more effective than civil law. Today's subway attacks have torn Japan's security net, woven of tradition and pragmatism. Tokyo has become even more unreal. Emotionally, the Japanese were able to come to grips with a natural disaster—the devastating earthquake in Kobe—in a surprisingly short time. However, the high-tech society has proved to be nearly helpless when dealing with such perfidious attacks."[23]

It is perhaps no coincidence that sarin is a poison **that** attacks the central nervous system, and that the physiological symptoms it causes reinforce the idea of the social body as a nervous system.

Generally speaking, the concept of the collective body as a nervous system found its mirror-image in the individual body, i.e. in a new type of illness. This is demonstrated by the preoccupation with nervous ailments that first cropped up in the late eighteenth century and dominated medical discourse in the late nineteenth century. The Scottish neuropathologist William Cullen neologized the term "neurosis" in the late nineteenth century to describe nervous illness, which he defined as all unnatural occurrences of sensation and movement and an unnatural make-up of the nervous system.[24] His theory of neurosis has little in common with current usage, but the concept of society as a nervous system is mirrored in it—a society through which the newly discovered lifeblood of galvanic electricity circulated. Cullen viewed all of life as a function of nervous energies, and sickness as a nervous disorder—an interpretation that survived until the end of the nineteenth century and even found expression in the early theories of psychoanalysis, which were initially marked by a physiological orientation. In *Studies on Hysteria*, for example, Joseph Breuer sought to explain the symptoms of hysteria by comparing it to an electric system: "We must imagine the cerebral pathway not as a telephone wire that is only stimulated electrically when it is supposed to function, i.e. when it is supposed to transmit a signal; but rather as one of those telephone lines through which a galvanic current constantly flows, and which cannot be stimulated when it disappears. Or, perhaps better put, let us imagine a many-branched electrical system for lighting and motor transmission which must establish a simple contact to brighten each lamp or start each machine. To make this possible and ensure the system is in a constant state of readiness, a current must flow through the entire network

even during periods of functional rest, and the dynamo electric machine must use a certain amount of energy too. Similarly, a certain degree of stimulation exists in the pathways of a resting, alert brain, one that is prepared to work." [25]

Initially, though, the causes of nervous illnesses were not sought in electrical currents, but in onanism, which in the late 18th century took the blame for all pathological manifestations of the nervous system. The old Christian sin paradigm of the "wasted seed" is discernible in this topos, as well as the idea of a sexual drive that has broken free of biological conditions and is spurred by the powers of the imagination. "Moderate intercourse is useful if nature has provided the drive. However, if a person is stimulated by imagination, he will only weaken the powers of the soul," wrote the Lausanne doctor Samuel Auguste Tissot in 1758 in his influential treatise on the dangers of masturbation.[26] Advances in microscope technology laid the groundwork for a more accurate understanding of the union of sperm and egg cell nucleus around 1875, and as it became possible to separate reproduction and sexuality, the idea that the sexual drive was controlled by "imagination " became the principal message of psychology. It contributed to the emergence of sexual studies, which emphasized the cultural codification of the sexual drive. Eugenics developed as a counterpart to this cultural inscription of the body: whereas one branch of science proclaimed sexuality's liberation from the constraints of reproduction, the other celebrated reproduction's liberation from the unpredictability of sexuality. Sexual studies contributed to the acceptability of the "nervous type" and laid the foundation for today's mainstream discourse on gender, now read as a function of language and cultural determination.

In the late nineteenth century the concept of the nervous type became detached from the paradigm of onanism (though not from the charge of being influenced by imagination) and was generally applied to people whose appearance and behavior appeared to elude any clear categorization, including the traditional biologically defined categories of "male" and "female." The nervousness concept was applied not only to homosexuals but also to women who fought for their right to vote or study. Behind this image of sexual ambiguity was the idea of the fake or the dissembler, which for its part was closely linked to newly emergent media simulation technology. Nervousness was increasingly seen in conjunction with living conditions in the modern city, with its restlessness, quickly changing rhythms, and confusing web of relations, created by communication media. The innovations of modernity, the city and its "strange characters" (dandies, gays, and women in drag who peopled cafes and all-night bars) were made responsible for nervous illnesses and neurasthenia. American civilization was seen as exemplifying the correlation between media technology and nervousness. The American physiologist George Beard, who coined the term "neurasthenia," defined nervousness as "nervelessness" and a "lack of nerve force."[27] In the foreword to his book *American Nervousness*, he wrote that the main cause of the rapid spread of nervousness lay in "modern civilization," which was distinguished from "**former** civilization" by five characteristics: "steam power, the periodical press, the telegraph, the sciences, and the mental activity of women." Under the conditions of modern civilization, it was thus inevitable that nervousness in its many variations should unfold.[28] Others viewed modern sexuality as the product of "immensely increased automobile traffic," the "global telegraph and telephone networks" and the "haste and excitement" of the cities, which had become "increasingly

slick and restless." "Our weary nerves seek to recuperate in increased stimuli, partaking of strongly spiced enjoyments, only to become even more exhausted."[29] Hence the nervous type became a mirror-image of a society which on the one hand believed its common denominator rested on cultural factors, and on the other had itself become the causative agent of a new syndrome.

The Collective Body and the "Jewish Body"

The fact that the same debates were conducted on the "Jewish body" as on gendered bodies indicates that the paradigm of the nervous type encompassed not only individual images of the sexes but also of the social body, and that this discourse was a highly explosive one for society. Equating nervousness with "civilization" and "American illness" was itself a guarantee of such explosiveness.[30] Jews had been barred from many occupations and property ownership for centuries, and after emancipation they primarily entered professions that owed their existence to the modernization processes of the industrial age. They were, indeed, the vanguard of modernism and symbolic figures of the collective as a nervous system. In Germany more than anywhere else, debates on the Jewish body were no less polarized than debates on women's suffrage and the admission of women to the university. Yet the discussion revolved explicitly around the question: is Jewish identity biologically or culturally determined? This question was at the center of the anti-Semitic discourse and the debates on the admission of Jews to the university, to public offices and academic careers.
The anti-Semites represented two positions that themselves mirrored the dual concepts of the collective body—the social body as a blood community or as a nervous system. The theoreticians whose arguments were biologically based availed themselves of the image of the blood community, the others of the image of a cultural community as a nervous system. However, both factions came to similar conclusions: for the first, Jews were defined by immutable race, for the second by immutable spirit. The Jewish spirit was viewed as constitutive of a specific unalterable nature. Artur Dinter explained: "The spirit is not . . . a product of race; on the contrary, race, the body, the earthly appearance of a person is a product of his spirit."[31] And it was precisely Jews who embodied "spirits of highly developed intelligence." This was the source of "their devilish malignancy and danger to the Aryan races."[32]

Such ideas about the dangers of the Jewish body played an important role in assimilation. It was not the orthodox but the assimilated Jews **which** were seen as a menace—the foreigners whose foreignness was no longer clearly visible, who had given up their caftans, beards, and earlocks, who had merged with their "host." They were now assigned new bodily and physiological features such as the "Jewish nose." This attempt to give visual form to Jewish "invisibility" was colored by ideas of sexual ambiguity. Anti-Semitic fears of a "non-recognizable Jew" blended with images of the sexually ambiguous new men and women who subverted the traditional biological definition of gender. Thus "racial scientist" Otto Hauser, whose work *Geschichte des Judentums* was cited by the National Socialists,[33] wrote of Jews: "In no other people does one find as many womanly men and manly women. This is the reason so many Jewish women are seeking to enter male professions, studying every conceivable subject, from law to medicine to theology; or becoming group leaders or

representatives. If one observes the secondary sexual characteristics of Jewish women, they are blurred in about a third of all cases. There are frequently distinct signs of a beard; breasts, on the other hand, are not pronounced; and their hair remains short." [34]

This means that in the discourse on the body, the idea of a neutralization of biological sexual difference permeates the political image of German-Jewish assimilation: the blurring of borders between the male and the female body was equated with the blurring of borders between Jews and Germans. Furthermore, assimilation itself was compared with the sex act—in both political and literary texts.[35] Since the fictions of sexual ambiguity (which found expression in the defamation of the "nervous type") merged with the fictions of the assimilated Jew, who was lent the same physical ambiguity, the same illnesses played a part. Hysteria, neurasthenia and nervousness were not only the typical illnesses of emancipated women, but also the typical illnesses ascribed to Jews. Whereas mental activity led to nervous illness in the female body, the Jewish predisposition to this disease was put down to an alleged "overtaxing and exhaustion of the brain."[36]

Metaphysics and the Organic Body

Thus, the social body, as a *corpus fictum*, creates its own self- and counter-images, reveals its normal and pathological manifestations, and imprints its mirror-image on the individual body. From the viewpoint of genetic science, one might also say: the social body and the human body clone each other, and the original is indistinguishable from the reproduction. This process is overseen by a branch of science that has been produced by media technologies which themselves are the result of scientific achievement. The study of the body shows more clearly than any other undertaking just how closely science and fiction are linked, indeed, just how indistinguishable they have become. If we now substitute metaphysics for the concept of fiction, it quickly becomes evident that past Christian history is of decisive importance for this relationship between science and fiction as a phenomenon that has evolved throughout history. And incidentally, it is conceivable that modern science's reluctance to address or contemplate metaphysics can be explained by its desire to conceal the paradigms which form the basis of its own research, and thus to camouflage the historical dimensions of its development. At the very least, it is noteworthy that this reluctance to address metaphysics goes hand in glove with a marked willingness to use religious imagery to typify scientific achievement: in *A Brief History of Time*, for example, Stephen Hawking writes that the scientist unveils "the mind of God,[37] while the physicist George Smoot compares the big bang theory to the "driving force behind the universe," asking: "And isn't that what God is?"[38] Also, Leon Ledermann, the Nobel laureate for physics, once called the subatomic unit the "God particle,"[39] believing it to be a determinant force in the universe. What historical process is concealed by this unwillingness to discuss metaphysics, which is coupled with references to the divine?

Up until the seventeenth and eighteenth centuries, departments of theology were the most important, if not the only, faculties at European universities. Theology produced the principles upon which

science was based and with which it was fitted out to achieve progress. Following the Enlightenment, this task was increasingly assigned to philosophy and history, two large fields that studied meaning and meaning formation in national communities. National communities, for their part, were rooted in a consolidation process via media technologies, as Benedict Anderson has shown so persuasively in his book *Imagined Communities*. Today the natural sciences, e.g. biology or medicine, are viewed as seminal to knowledge production since they are "hard sciences" with the benefit of predictability: proceeding empirically, they produce verifiable results. Whereas the humanities and liberal arts are characterized by unpredictability, ambiguity, and findings that cannot be clearly proved, hard science argues with numbers, statistics, and clearly defined values that cannot be fictionalized. Paradoxically, the old obsession with immortality is reestablishing itself precisely in these disciplines—due not only to the fantasies of lay people, but to those of scientists as well.

"If you want me to believe in God, I must be able touch him,"[40] said the theology student Denis Diderot in the late eighteenth century before devoting himself to philosophy and becoming the great champion of the French Enlightenment. Diderot's career was no accident. As numerous examples from his *Encyclopédie* show (images of the gendered body are highly revealing here [41]), the high value attached to transparency and predictability in modern science not only won the day against theology (and the liberal arts); it emerged from this very field. One hundred years before Diderot, Descartes compared the healthy body to a well-functioning machine,[42] thus making out of God, whose creative power he never denied, a highly qualified mechanic. However, Descartes also proclaimed: "Philosophy is like a tree. The roots are metaphysics, the trunk is physics, and its branches the other sciences."[43] Here he paints a picture of science as a branch of knowledge that regards the visible world as a product of the transcendental. A belief in predictability has accompanied Christianity since Scholasticism, and it has created a paradox that can be observed throughout the history of Christian thought since the Late Middle Ages: hardly any other world religion has so adamantly opposed innovation in the fields of science and technology, even persecuting the innovators, while at same time producing so many technical and scientific innovations.[44] One cannot say that the innovators were heretics. Many came from monasteries or were deeply religious individuals like Leibniz, who believed that the number system was a proof of God's existence. There is another way of understanding this contradiction: it resulted form a Christian pattern of thought that has pressed for the materialization of the Christian message—a message of salvation that is inherent in God's becoming flesh. With the onset of modernity, this pattern of thought slowly freed itself from the context of the Church and triggered the historical dynamic described by Cornelius Castoriadis, who argues that the great explosion of knowledge in modern times does not represent a technological achievement, but rather precedes it: "The successive upheavals that can be observed in the 'rational knowledge' of all known societies presuppose a fundamental transformation of the entire imaginary conception of the world (and of the ideas about the nature and goal of knowledge itself). The last of these upheavals, which took place several centuries ago in the West, produced the curious idea that everything that exists is rational (and mathematizable), that it is our right to fully exploit any possible knowledge, and that the goal of knowledge is the domination and appropriation of nature."[45]

However, if it is true that a change in the imaginary conception of the world preceded the modern age, then this can only be the product of Christianity—or a specific form of "Christian" writing society. Brian Stock has eloquently described how Europe developed from an orally determined society to one that lived by the law of the written word between the late tenth century and the period around 1300. This happened long before book printing and general literacy were realities. On the contrary, the invention of the printing press appears to have been a necessary *consequence* of this evolution. The person who lives by the "written word" also lives by science, clarity, and standardization—and thus makes use of the criteria of hard science. The Christian restructuring of the world based on the laws of writing went hand in glove with an increased synchronization of religious and secular power. This applies both to the codex regulating community life and to the representation and symbols of the social body. All told, it should come as no surprise that the idea of immortality, adopted from Christianity, should increasingly manifest itself in the branches of science that reflect the materialization of Christianity.

Genetic science, which can be interpreted as the corporeal metaphor of modernity, most clearly demonstrates the close relationship between science and metaphysics in Christian and post-Christian societies. Media technology, writing, the alphabet and the binary code[46] are combined in genetic science with knowledge and religious paradigms, which are reflected in the biological and social concepts of the body.

A more comprehensive version of this essay is available in German on the Internet at www.scienceandfiction.de.

Notes:

1 One example is Professor Wilhelm Erb, in Arthur Kirchhoff, ed., *Die Akademische Frau: Gutachten hervorragender Universitätsprofessoren, Frauenlehrer und Schriftsteller über die Befähigung der Frau zum wissenschaftlichen Studium und Berufe* (Berlin: Hugo Steinitz Verlag, 1897), 128.

2 Ernst H. Kantorowicz, *Die zwei Körper des Königs: Eine Studie zur politischen Theologie des Mittelalters*, transl. Walter Theimer and Brigitte Hellmann (Munich: dtv, 1990), 206.

3 Cf. Mary Douglas, *Die zwei Körper*. ***Ritual, Tabu und Körpersymbolik,* Sozialanthropologische Studien in Industrie- und Stammesgesellschaft, Frankfurt/M 1993.**

4 I Corinthians 10:17.

5 Romans 12:5; see also I Corinthians 12:27.

6 Ephesians 5:23 and 28.

7 Kantorowicz, *Die zwei Körper*, 39. (English translation from Kantorowicz, *The King's Two Bodies: A Study in Mediaeval Political Theory* [Princeton: Princeton University Press, 1957], 15-16.)

8 Kantorowicz, *Die zwei Körper,* 222.

9 Ibid, 225.

10 Ephesians 5:28.

11 Von Hippel, *Theodor Gottfried: Über die Ehe* (Berlin, 1774), 96.

12 Walter B. Cannon, *The Wisdom of the Body* (Boston, 1932). Jakob Tanner, "Weisheit des Körpers und soziale Homöostase: Physiologie und das Konzept der Selbstregulation," in *Physiologie und industrielle Gesellschaft: Studien zur Verwissenschaftlichung des Körpers im 19. und 20. Jahrhundert*, ed. Philipp Sarasin and Jakob Tanner (Frankfurt a. M.: Suhrkamp, 1998), 129 –169.

13 Thomas Hobbes, *The Leviathan: Parts I and II* (Indianapolis: Bobbs-Merrill Company, 1958), 201-202.)

14 Hobbes, *Leviathan*, Chapter 31: "Of the Kingdom of God by Nature," 286.

15 Cf. Jochen Hörisch, *Brot und Wein: Die Poesie des Abendmahls* (Frankfurt a. M.: Suhrkamp 1992), 19.

16 Cf. Iring Fetscher, "Einleitung zum Leviathan," in Thomas Hobbes, *Leviathan oder Stoff, Form und Gewalt eines kirchlichen und bürgerlichen Staates*, edited and with an introduction by Iring Fetscher (Frankfurt a. M., 1999), pp. XXXIV–XXXIX.

17 Transsubstantiation is the religious teaching that the host and the wine not only symbolize the blood and body of Christ, but attest to his real presence.

18 Hobbes, *Leviathan,* Chapter 37, "Of Miracles and Their Use."

19 Artur Dinter, *Die Sünde wider das Blut* (1917; Leipzig, 1927).

20 Cf. Christina von Braun, *Böses Blut: Geschichte der Mythenbildung um die Syphilis* (film), 1995.

21 Adolf Hitler, *Mein Kampf*, unabridged edition (Munich: Franz Eher Nachf., 1940), 270.

22 William Cannon assumed that his concept of social homeostasis, developed in *The Wisdom of the Body*, could function particularly well in modern industrial states with their diverse transport and information systems, since these states provided the necessary conditions for interaction between social forces. He was either unaware that he was experimenting with a new metaphor for the social body, or he was consciously exploiting the historical effectiveness of this metaphor. His efforts to demonstrate the physiological basis of his social body theories on the individual body support the second reading.

23 ARD, Brennpunkt, 20 March 1995.

24 Quoted in Karl Braun, *Die Krankheit Onania: Körperangst und die Anfänge moderner Sexualität im 18. Jahrhundert* (Frankfurt a. M.: Campus, 1995), 67.

25 Joseph Breuer and Sigmund Freud, *Studien zur Hysterie* (1895; Frankfurt a. M., 1970), 156.

26 Quoted in Braun, *Die Krankheit Onania*, 47.

27 George Beard, *American Nervousness: Its Causes and Consequences* (New York: Putnam 1881), 5.

28 Ibid, pp. VI –VII.

29 Quoted in Sigmund Freud, "Die kulturelle Sexualmoral und die moderne Nervosität," in *Gesammelte Werke*, vol. VII, 146. The passage quoted by Freud is taken from Wilhelm Erb, *Über die wachsende Nervosität unserer Zeit* (Heidelberg, 1893).

30 Cf. August Forel, *Die Sexuelle Frage* (Munich: Reinhardt, 1906).

31 Artur Dinter, "Die Rassen- und Judenfrage im Lichte des Geistchristentums," in *Der Jud ist schuld …? Diskussionsbuch über die Judenfrage* (Basel/Berlin/Leipzig/Vienna: Zinnenverlag, 1932), 95 –106, 96.

32 Ibid, 101.

33 Otto Hauser, *Geschichte des Judentums* (Weimar: Verlag Alexander Duncker, 1921).

34 Quoted in Gottfried Feder (Reichstag representative), "Die Judenfrage," in *Der Jud ist schuld …?* (1932), 53– 68, 61.

35 Werner Sombart, "Artvernichtung oder Arterhaltung," in *Der Jud ist schuld …?* (1932), 249 – 253, 252.

36 Martin Engländer, *Die auffallend häufigen Krankheitserscheinungen der jüdischen Rasse* (Vienna: Pollak, 1902), quoted in Sander L. Gilman, *Difference and Pathology: Stereotypes of Sexuality, Race and Madness* (Ithaca/London: Cornell University Press, 1985), 156.

37 Stephen Hawking, *A Brief History of Time* (New York: Bantam, 1988).

38 Quoted in Bryan Appleyard, "In Science We Trust," *The New York Times*, 7 April 1993.

39 Lederman, Leon: *The God Particle*. New York: Houghton Mifflin 1992.

40 Denis Diderot, *Lettre sur les aveugles à l'usage de ceux qui voient* (Genève/Lille, 1951), 40.

41 Cf. Christina von Braun, "Ach Adam," in *Die Welt der Enzyklopädie*, ed. Annette Selg and Rainer Wieland (Frankfurt a. M.: Eichborn, 2001).

42 "And just as a clock made of wheels and counterweights observes not any less accurately all natural laws when it is badly made and shows time incorrectly than when it satisfies all the maker's wishes, so too do I observe the human body as a kind of machine that has been assembled from bones, nerves, muscles, veins, blood, and skin in such a way that even if there were no mind in it, it would still perform the same movements which happen involuntarily and therefore without the aid of the mind. . . ." René Descartes, "Untersuchungen über die Grundlagen der Philosophie, worin das Dasein Gottes und die Unterschiedenheit der menschlichen Seele von ihrem Körper bewiesen wird," in *Philosophische Werke*, transl., elucidated and with a description of Descartes' life by J. H. von Kirchmann, section I – III (Berlin, 1870), section II, p. 110.

43 Quoted in Fritjof Capra, *Wendezeit: Bausteine für ein neues Weltbild*, transl. Erwin Schuhmacher (Bern/Munich/Vienna, 1983), 68.

44 Cf. Stanislav Andreski, "Religion, Science and Morality," in *The Encounter*, June 1987.

45 Cornelius Castoriadis, *Gesellschaft als imaginäre Institution: Entwurf einer politischen Philosophie,* transl. Horst Brühmann (Frankfurt: Suhrkamp Taschenbuch, 1990), 454.

46 Hans Jörg Rheinberger, "Alles, was überhaupt zu einer Inskription führen kann," in *Wissensbilder: Strategien der Überlieferung*, ed. Ulrich Raulff and Gary Smith (Berlin: Akademie Verlag, 1999), 265 –278, here 275.