

# **“Of Bugs and Rats: Cyber-cleanliness, Cyber-squalor, and the Fantasies of Globalization”**

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## **1. Of Bugs and Rats**

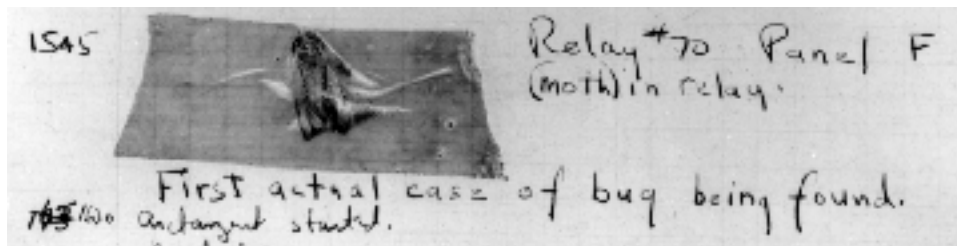


Figure 1. “First actual case of bug being found.” From Hopper, “The First Bug,” 285.

Admiral Grace Murray Hopper, a pioneer of American computing perhaps best known for leading the development of the programming language COBOL, is also the most celebrated source of an often-repeated anecdote which has become part of computer science folklore. As Admiral Hopper tells the story,

In the summer of 1945 we were building Mark II; we had to build it in an awful rush – it was wartime – out of components we could get our hands on. We were working in a World War I temporary building [on the campus of Harvard University]. It was a hot summer and there was no air-conditioning, so all the windows were open. Mark II stopped, and we were trying to get her going. We finally found the relay that had failed. Inside the relay – and these were large relays – was a moth that had

been beaten to death by the relay. We got a pair of tweezers. Very carefully we took the moth out of the relay, put it in the logbook and put Scotch tape over it. (Hopper, 285–86.)

The logbook recording this event was long kept in a display case at the Naval Surface Warfare Center, open to the page to which the moth was taped. Beneath the insect's corpse, a handwritten entry noted dryly that it represented "the first actual case of a bug being found" (Figure 1) The logbook is now in the collection of the Natural Museum of American History, at the Smithsonian Institution.<sup>1</sup>

Consider now a more recent intrusion of the real into computational space:

KAMPALA, Oct 13, 1998 (Reuters). Thousands of Ugandan students are unsure whether they have won university places after rats chewed through computer cables at the National Examination Board causing the system to crash, a newspaper reported on Tuesday. The *New Vision Daily* said senior board officials were very concerned that rodents were able to infiltrate areas holding such vital information. The hitch has affected students who were to be placed in teacher training colleges, polytechnics and medical institutions. It is not the first time that rats have eaten away at important installations in Uganda. Earlier this year they chewed through telecommunications wires, cutting off phone links to parts of western Uganda and Rwanda. Last week a workshop on law reform heard that reams of vital computerised court evidence had been lost in the same way.

The Reuters news story has none of the humorous appeal of Hopper's anecdote. The mental image of one moth crushed in an electrical relay is unlikely to elicit the anxious *frissons* provoked by the image of rats swarming in the moist darkness, gnawing on data and electrical cables with implacable, intemperate appetite. The insect culprit of Hopper's account is sufficiently insubstantial (literally: desiccated) so as to fit easily into the tropology of modern technical discourse, in which a "bug" is something structural

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<sup>1</sup> The episode is often cited as the first use of the term "bug" in the sense of a "fault" or "malfunction." As the logbook entry suggests, this was not the case; "bug" had had a long history of being used in this context. See the entry on "bug" in the Jargon File, <<http://www.wins.uva.nl/~mes/jargon/b/bug.html>>.

or procedural: an unforeseen glitch in logic or function, which may be corrected once it is found. Rats, by comparison, are stubbornly resistant to this sort of metonymy – there’s no getting away from the beady eyes, the gnashing teeth, the slinking tail; rodents seem uncannily out of place in the sterile abstractions of cyberspace. The origin myth of the bug is, moreover, a story of computational victory: the offending organic matter jamming the logic machine is located by its human attendant and safely removed; the program continues, undeterred. If, on the other hand, rats are busy in the bowels of the machine – excretory metaphors seem especially apt here – eating away at its infrastructure, we might never locate the damage they’ve caused before valuable data is lost forever. Sinister adversaries for the programmer, they could be anywhere in the dark, biding their time; no method of formal verification or debugging, no pair of tweezers and bit of cellophane tape will help.

The crucial distinction between the two narratives, we propose, comes down to how they govern a resistant real kernel that is figured in both of them. Hopper’s anecdote plays on the linguistic disjunction between a way of naming an ill-fated moth and a way of naming a fault of software – that is, a disjunction between a living, material thing (the moth as a sort of “bug,” literally, an insect), and an immaterial *property* of a computer program. Programming bugs may certainly have material consequences, but they themselves are insubstantial, precisely because they are discernible only in interruptions of normal program execution.<sup>2</sup> The historical, physical moth remains after the breakdown described by Hopper, but only as a triumphalist trophy of the immaterial order of computing.

The Reuters account of rats chewing through cables admits of no such wordplay: the

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<sup>2</sup> See Neumann, Perrow, Peterson, and the essays collected in Coleman, Fetzer, and Rankin for discussions of the inevitability of design faults in computer software and hardware, and of the influences of material factors on “real-world” computing applications.

spectre of the rat – expressly because of the creature’s appetitive materiality, its uncanny, “out-of-placeness” in the computer – is irreducibly, horribly *tautological*: the rat is in this sense equivalent to the unsymbolizable residue it leaves behind – disease, filth, hunger – in the fantasy of the gnawed-upon logic machine.

We propose that the historical political-economic significance of these two species of material resistance is made clear when they are understood in relation to long-standing western narratives associating figures of horrific materiality with fantasies of the uncontrolled primitive and technological cleansing.

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## 2. Just So Stories

Nineteenth-century Indian social reformer Swami Vivekananda characterized the contemporary European view of his country thus:

Three hundred million souls, ...swarming on the body of India, like so many worms on a rotten, stinking carcase, – this is the picture concerning us, which naturally presents itself to the English official!<sup>3</sup>

Christopher Herbert argues that the social and ethnographic discourses of the 19th and 20th centuries are shaped by the Foucauldian spectre of an uncontained, “lawless infinity of desire”: “the obscure and repeated violence of desire battering at the limits of representation.”<sup>4</sup> Herbert’s history of the 19th-century ethnographic imagination emphasizes Methodist founder John Wesley’s fantastical theology of sin, which (with Sade’s eroticization of violence) informs the modern episteme (Foucault, 250). Symbolic representation plays against and within a field of primitive forces and energies “prior and alien to and implicitly destructive of symbolic order” (Herbert, 31).

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<sup>3</sup> *East and West* (1901) Cited in Arnold, 284.

<sup>4</sup> Foucault, 210, 362. Cited in Herbert, 31.

Figures of desire, horror, filth, boundless visceral appetite, and lawless lust: We propose that, coiled within the popular cybercultural discourse that pronounces the ends of History, the nation-state, and anti-modernity lie tropes familiar to historians of colonialism. The euphoric narrative of *informational* globalization announces a coming utopia of unlimited access to knowledge, unfettered economic exchange, and democratic individualized freedom.<sup>5</sup> This narrative presumes an historical rupture with the psychic and political economic orders of the Age of Exploration and Colonialism, opening a new ethnographic field in which to situate the postmodern cyber-subject. Faults of distribution and access in the current state of the global network are openly acknowledged, but only as engineering problems – “bugs” – which will one day be corrected by technical mastery and/or entrepreneurial initiative.<sup>6</sup>

We suggest, however, that these faults are not merely technical or developmental aberrations, but, rather, constitutive elements of an emerging Imaginary that intensifies and refigures older political economic differentials along a familiar – but modified – axis of civilization and savagery, cleanliness and filth. Cybercultural narratives of desire for subjection to and fusion with the machinic are inseparable from the modern and postmodern subject’s horror of the filthy – that is, of residual matter which is not susceptible to technological governance. This is precisely the matter that has proved vexing to colonial and post-colonial discourses of identity and alterity. The moth-bug’s reassuring metonymy and the rat’s stubborn, appetitive materiality are contemporary refigurations of mythologies much older than the Age of Information.<sup>7</sup>

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<sup>5</sup> Our use of the adjective “informational” to describe the nexus of late capitalism and cyberculture follows Manuel Castells’s use of the term. See Castells, *The Rise of the Network Society*, 1–28.

<sup>6</sup> For extended critiques of this narrative, see Stallabrass and Castells.

<sup>7</sup> This essay extends themes of some of our prior published work on the discourses of global Internet diffusion, and Imperial colonial scientific and hygienic discourses. See Harpold, “Dark Continents,” and Philip, “English Mud.”

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### 3. The Monstrous and the Filthy

For over twenty centuries, western philosophers and travellers recorded supposedly factual accounts of fantastic creatures found to the east of Greek and European civilization: unicorns, dragons, chimerae, giants of all kinds, human cyclops, men with multiple or animal heads, men with faces in their chests, ape-like androgynous figures with grotesquely matted hair, and so on. The Alexander Romance tradition, initiated by narratives of Alexander the Great's encounters with these and similar creatures in India, became the inspiration for stories of fabulous violations of "natural" forms, and influenced encyclopedists and theologians up through the Renaissance and Enlightenment (Figure 2).<sup>8</sup>



Figure 2. Images of human and animal monsters typical of the Alexander Romance. Left: "Ethiopia." From *Les secrets de l'histoire naturelle contenant les merveilles et choses mémorables du monde*, fol. 20. France, 1480 (Source: Devisse and Mollat, 2: 227). Right: From Sebastian Münster's *Cosmographiae Universalis*, lib vi. Basel, 1554 (Source: Campbell, 46.)

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<sup>8</sup> For a discussion of the most popular of these accounts, see Campbell, ch. 2.

The monstrous and the bizarre served to mark the strangeness of the Other lands beyond the pale of the civilized world. Images of the fabulous East and images of the devil at home commonly used the same language, sometimes borrowing specific figures and descriptions from each other. Travellers in 17th century India saw, for example “the lascivious Greek and Roman underworld of satyrs, Pan, and Priapus” (Cohn, 4) – devils and the evil spirits of nature consorting with the natives, who themselves appeared as bizarre hybrids of the human and the animal. As McClintock observes, this tropic slippage among the alien, the monstrous, and the sinful encoded powerful libidinal energies:

For centuries, the uncertain continents – Africa, the Americas, Asia – were figured in European lore as libidinally eroticized. Travelers’ tales abounded with visions of the monstrous sexuality of far-off lands, where, as legend had it, men sported gigantic penises and women consorted with apes, feminized men’s breasts flowed with milk and militarized women lopped theirs off. ...Long before the era of high Victorian imperialism, Africa and the Americas had become what can be called a porno-tropics for the European imagination – fantastic magic lantern of the mind onto which Europe projected its forbidden sexual desires and fears. (22)



Figure 3. “Ourang Outang,” the Malay “man of the woods.” A “female satyr” described by Jakob de Bondt, in Willem Piso, *De Indiae utriusque re naturali et medica*, 1658 (Source: Lach, 1991, 12.) Right: “The Black Gin.” Illustration to J. Brunton Stephens’s poem, “To a Black Gin.” *Queensland Punch*, October 1, 1890. (Source: Woodrow. )

The specificity of overlap between the anti-Christ at home and the normative abroad suggest a fairly straightforward displacement of fears rooted in the western self onto an eastern Other. The strangeness of the Other, however, came nearer and became more troublesome in the Ages of Discovery, Exploration, and Colonialism. The medieval ‘fabulous’ tradition lost its explicit links with theology and art, but none of its ability to evoke visceral horror, as 17th and 18th century travellers and 20th century administrators attempted to render difference tractable while still preserving its putative integrity. The autochthonic monster mutated, over time, into a less fabulous – but no less alien – part-animal or imperfectly human *primitive*, whose humanity was overshadowed by the traits of its variance from a Eurocentric norm: in physiognomy, skin color, manner of dress (meaning often, an absence of “modest” clothing), religious, cultural, and sexual practices (Figure 3). The monsters described by medieval and early Renaissance travellers had seemed to them evidence of the superabundant mystery of God’s creation. In an era increasingly dominated by the discourse of Reason, the alterity of the colonial native appeared to testify to a disjunction between spiritual and scientific/anthropometric descriptions of the real. Examples of this disjunction appear in colonial writing across the globe, from the Congo to Australia. J. Brunton Stephens’s 1890 poetic puzzling over the humanity of an Aboriginal woman (“To a Black Gin,” Figure 3) is typical:

Thou art not beautiful, I tell thee plainly,  
Oh! thou ungainliest of things ungainly;  
Who thinks thee less than hideous dotes insanely.

Most unaesthetical of things terrestrial,  
Hadst thou indeed and origin celestial?  
Thy lineaments are positively bestial!

Yet thou my sister art, the clergy tell me;  
Though, truth to state, thy brutish looks compel me  
To hope these parsons merely want to sell me.



A hundred times and more I've heard and read it;  
But if Saint Paul himself came down and said it,  
Upon my soul I could not give it credit.

...

Thy nose appeareth but a transverse section:  
Thy mouth hath no particular direction -  
A flabby-rimmed abyss of imperfection.

Thy skull development mine eye displeases;  
Thy wilt not suffer much from brain diseases;  
Thy facial angle forty-five degrees is.

The coarseness of thy tresses is distressing,  
With grease and raddle firmly coalescing,  
I cannot laud thy system of "top-dressing."

Thy dress is somewhat scant for proper feeling;  
As is thy flesh, too – scarce thy bones concealing:  
Thy calves unquestionably want re-vealing.

Thy rugged skin is hideous with tattooing,  
And legible with hieroglyphic wooing –  
Sweet things in art of some fierce lover's doing.<sup>9</sup>

There are obviously significant ruptures between the modes of global travel in medieval times and the forms of political economy that emerged in the 16th century, and developed with the full flourish of industrial capitalism in the late 19th century.<sup>10</sup> However, the image of the monstrous, the radically inhuman, and the unredeemably bestial persisted as a remainder inaccessible to the new linguistic economy of the Rational and the Real. The human and physical sciences were called upon to manage this remainder, so that procedures of resource- and population-management might proceed unimpeded by the recalcitrant bodies and vapors of the East.

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<sup>9</sup> ... And so on. The full text of the poem is cited on Ross Woodrow's "Race and Image" web site. See <<http://www.newcastle.edu.au/departement/fad/fi/woodrow/race.htm>>.

<sup>10</sup> See, for example, Wallerstein.

Increasingly, *the colonial domain itself* was seen as constitutive of its horrors. When one was no longer contemplating the alien from afar but rather dwelling among it, the fear of its contamination intensified, in the form of colonial anxieties regarding the “miasmatic” vapors of the tropics. Just as the medieval discourse of monsters had bled over border crossings with the Age of Reason, the “environmental” theory of disease persisted in the colonies long after it had been superseded in Europe by germ theory. India continued to be the site where many of these discourses emerged; they would travel, in remarkably stable forms, to other sites in the British Empire, to Southeast Asia and to Africa.<sup>11</sup>

Historian of medicine David Arnold describes the colonizers’ fears of the pathogenic environment thus:

It was the lethal combination of heat and humidity and the hot, moist air’s capacity to hold poisonous, disease-generating “miasma” in suspension that appeared to make tropical regions so deadly. Bengal’s jungles, creeks, and marshes, its hot and humid climate, and the great variations in temperature between and within seasons seemed to provide an almost archetypal example of the savage effects a hostile environment could have on the human constitution. (33)

The Environmental theory of disease held that the causes of disease were in climate, topography, and vegetation, in conjunction with the effects of heat and humidity on European constitutions, and the idiosyncratic nature of disease in India. It therefore rejected the direct application of western medicine, assuming an intrinsic difference in the nature of disease and therapeutics in the tropics (Arnold, 58–59). Not only would Westerners have to behave differently in the East, it followed, they would have to preserve their vigor and strength if they wished to escape the torpid weakness of the

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<sup>11</sup> Imperial medicine offered one of the strongest discourses of the native body and its infectiousness. As an episteme of tropical hygiene emerged, it was carried by British botanists, surgeons, and administrators from one colony to another, and back to the metropole. For parallels in Africa, see Coombes; in Australia, see Griffiths and Robin; for a French construction of the savage, see Bullard.

native. In order to preclude contamination by the languor of the tropical vapors, an elaborate system of individual behavior emerged, focused on preserving the boundaries between dirt and cleanliness, activity and torpor, production and decay. The description of the pathogenic environment gradually came to include additional markers of social and cultural difference, blurring the boundaries between ethnographic and climatic data. Colonial medicine and anthropology thus intertwined had a powerful effect on the public imagination in scientific as well as in popular contexts.

The urgency of disease containment was, however, thwarted in the everyday spaces of the colonized world. If they were not to allow themselves to be undermined, the discourses of scientific management had to retreat to institutional spaces that they could more easily regulate: jails, barracks, schools, and hospitals.

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#### **4. The Cleanroom**

A single computer microprocessor is slightly smaller than a US penny and may include millions of transistors (Figure 4). Their small size and complexity make transistors vulnerable to damage by even microscopic objects: a single speck of dust falling on a microprocessor can render it unreliable or unusable. Gases produced in the manufacturing process may also damage transistors if they are not quickly eliminated from the surrounding atmosphere.



Figure 4. “This enlarged image of a grain of salt on a piece of a microprocessor should give you an idea of how small and complex a microprocessor really is.” Image and caption copyright ©1999 Intel Corporation. <<http://www.intel.com/education/chips/clean.htm>>

Thus, much of the effort associated with the commercial production of microprocessors is devoted to insuring that the environment in which they are manufactured is as free as possible from airborne contaminants. Critical stages of manufacture take place in hermetically-sealed spaces known as “cleanrooms.”<sup>12</sup> The atmosphere in a cleanroom is kept at a constant temperature and humidity, and is positively pressurized to prevent inflow of air when entrances to the room are opened. The room’s entire air supply may be cycled as often as ten times a minute through high-efficiency filters which trap gaseous contaminants and all but the very smallest particles. Exposed surfaces in the room are made of coated, highly-polished metal and non-porous synthetic materials, free of microscopic fissures and cavities which might collect debris. Machinery with moving parts or open reservoirs of liquid – anything which might introduce microscopic droplets or debris – are kept to a minimum. All forms of paper – a

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<sup>12</sup> The cleanroom technologies we describe in this essay are not unique to microprocessor manufacturing. They are also used in research and manufacture which require strictly-controlled atmospheric conditions – for example life sciences applications involving disease organisms, pharmaceutical production, and the manufacture of prosthetic implants.

notorious dust and bacteria magnet – are prohibited. The most environmentally controlled of all cleanrooms, known as “class one” cleanrooms, contain no more than one speck of dust per cubic foot of air – as little as 1/10,000 the level of airborne particles in a modern hospital operating theater.<sup>13</sup>

The primary source of contaminants in the cleanroom are the human beings who must be present at several stages of the manufacturing process.<sup>14</sup> Workers in cleanrooms devoted to commercial microprocessor production wear specially-designed garments, known in the industry as “bunny suits” (Figure 5).<sup>15</sup>



Figure 5. Cleanroom worker in “bunny suit.” Image copyright ©1997 Intel Corporation. <<http://www.intel.com/pressroom/archive/releases/cn12297a.htm>>

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<sup>13</sup> The *1995 Applications Handbook* of the American Society of Heating Refrigeration and Air-conditioning Engineers (ASHRAE) defines permissible limits for the size and number of airborne particles in a “class one” cleanroom thus: 0.1 micrometer ( $\mu\text{m}$ ) particles per cubic foot: 35; 0.2  $\mu\text{m}$  particles per cubic foot: 7.5; 0.3  $\mu\text{m}$  particles per cubic foot: 3. A micrometer is one millionth of a meter. By way of comparison: the largest known viruses are about 0.3  $\mu\text{m}$  in diameter.

<sup>14</sup> See Ljungqvist and Reinmüller, 37. Efforts to fully automate cleanroom microprocessor manufacture have had limited success – for the time being, Mathas notes, the adaptability of the human machine outweighs the inconveniences of its dirtiness.

<sup>15</sup> The etymology of the term is uncertain. Intel has trademarked the term “BunnyPeople,” to describe their cleanroom-suited workers.

Getting into a bunny suit requires following a specified series of steps designed so as not to “compromise” the suit.<sup>16</sup> Workers must first minimize contaminants they may bring to the suit’s interior: getting rid of any gum, candy, etc.; rinsing the mouth and throat so as to remove stray food particles; washing all exposed skin to remove dirt, makeup, and loose hairs or flakes of skin; covering head and facial hair with lint-free hoods and masks; cleaning shoes carefully before covering them with multiple shoe covers; passing through a high-pressure air shower to blast away dust from their street clothing. This process takes place in a room divided into progressively “cleaner” zones – a worker, for example, must not allow her shoe to touch the floor on the “clean” side of a bench until the shoe has been properly covered. The parts of a bunny suit – belted gowns, booties, gloves, helmets, protective goggles and sealed faceplates – are donned in another room in several stages, and workers must be careful not to allow any article of clothing to make contact with a surface of the gowning room before it has been tucked in and fastened appropriately. Each suit is equipped with an individual filtering unit to purify the air breathed out by the worker, trapping any exhaled fluids or particles.

The cleanroom and the bunny suit offer limited protection for the worker against highly toxic chemicals used in microprocessor production.<sup>17</sup> But these barrier technologies serve primarily *to isolate the space of production from the debris of the worker’s body*.

Microprocessors are certainly jeopardized by the matter that sloughs off of the body as

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<sup>16</sup> An Intel web site devoted to “working in a cleanroom” lists 43 separate steps involved in putting on a bunny suit and entering a cleanroom. See <http://www.intel.com/education/chips/cleanroom.htm>.

<sup>17</sup> Many of the substances used in the manufacture of computer chips are highly toxic and long-lived in the environment. It is one of the ironies of the high-tech economy that the manufacturing technologies which support it are equally or more destructive of the environment as those of traditional industrial practices. See, for example, Sachs’s overview of the environmental costs of the growth of the computer industry in California’s “Silicon Valley.”

it moves through space. But this functional necessity, we propose, serves in another context to support a *psychic* necessity: a rationalized, sterile, and decorporealized Imaginary we believe to be characteristic of cyberculture in general, and especially of its forms of production. The ritualized technologies of the cleanroom establish a *cordon sanitaire* freed of material difference and its dangers, and in which human labor is subject to principles of technical and psychic cleanliness in keeping with the demands of a machinic order: the grain of dust which threatens the transistor poses no threat to the human organism.<sup>18</sup> The cleanroom excludes the environmental threat of stray matter by containing it within the active field of the worker's body. The bunny-suited worker is the inverted (to be more precise, the introjected) psychic form of the "filthy savage" of the colonial Imaginary: the perceived dangers of dirt and dis-ease are reflected back onto the technophilic, civilized body; despite heroic efforts to govern its debris, that body – indeed, *any organic body whatsoever* – threatens to compromise the space of production.

We would claim, moreover, that the bunny-suited worker is dematerialized in a specifically social sense, in keeping with the deracialized, genderless utopia celebrated by the evangelists of the "virtual community." Not only is the worker's organic corporeality sealed off from the space of her labor, but specific evidence of her gender and race is occluded as a consequence of sealing off the body: the bunny suit's helmet obscures her face; the baggy suit's frumpy, unisex appearance hides her body. The disco-dancing "BunnyPeople" of Intel's 1997 advertising campaign for the Pentium II Processor with MMX™ Technology are clothed in shiny, rainbow-hued bunny suits

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<sup>18</sup> This is one of the ways in which the cleanroom spaces of microprocessor production differ from cleanrooms and "containment rooms" used in the handling of infectious organisms. In the latter case, the technologies involved serve to protect the worker from infection, rather than to protect the space of production from the debris of the worker's body. In both cases, of course, the process of containment supports a fantasy of an idealized, hyper-clean human body.

(Figure 6).



Figure 6. Left: Still from Intel's Superbowl XXXII "BunnyPeople" television ad. Image copyright ©1997 Intel Corporation.  
<<http://www.intel.com/pressroom/archive/releases/cn12297a.htm>>. Right: "Medieval monsters." *n.d.* (Source: Hodgen, 125.)

"Actual" bunny suits are uniformly white. The Intel commercials substitute an abstract marker of difference – rainbow colors of an idealized uniform – for those which it strips away as a consequence of its isolation of the body.<sup>19</sup>

The BunnyPeople are not monstrous. They are, rather, cheerful and reassuring, even cute and cuddly. A tag line of the BunnyPeople campaign insisted that the new chips "put the fun in computing."<sup>20</sup> Though the Pentium II campaign has been superseded by others for newer, more-advanced microprocessors, one can still purchase BunnyPeople beanbag dolls, jewelry, handbags, T-shirts, and the like, from Intel's web site.

We suggest, however, a filiation between ludic images of the hermetically-sealed

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<sup>19</sup> The use of 1970s disco music in these commercials contributes to this neutralization of racial identity. In the US at least, disco of the sort played in the Intel commercials was based on music originating in African-American rhythm and blues, but enthusiastically adopted by white urban youth and young white professionals.

<sup>20</sup> <<http://www.intel.com/pressroom/archive/releases/cn12297a.htm>>.



BunnyPerson and the monstrous, ungovernable Other of medieval and Renaissance travel narratives (Figure 6). Both forms are oriented by a fundamental fantasy relating the boundaries of the subject to threatening extremities of matter. In the case of the cleanroom, the danger is attributable to any body, regardless of its familiarity: in other words, *in the domain of cyberculture, the residue of all bodies is dangerous, infectious, and repellent*. The leftover of the body poses a risk to the smooth working of the informational system of production; it must be eliminated or – at least – trapped and expelled. The subject position of an idealized clean, normative body which served to distinguish the European colonialist from the native and the miasmatic landscape is, in the tropology of the cleanroom, *identified with the microprocessor*. The position of the infectious, filthy savage which must be governed or contained, is taken up *by the worker*, insofar as she is enclosed, cordoned off, within the boundaries of the suit.

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## 5. Cyber-cleanliness and Cyber-squalor

At all the more important moments while he was telling his story his face took on a very strange, composite expression. I could only interpret it as one of *horror at pleasure of his own of which he himself was unaware*.

– Freud, “Notes Upon a Case of Obsessional Neurosis [The Rat-Man],” 1909

It seems clear to us that this technophilic fantasy of a decorporealized subject logically concludes in a mythology that fascinates contemporary discourses of computing: that of the subject whose consciousness has been “uploaded” into the network, where she roams freely without the encumbrances of a real body.<sup>21</sup> Because we consider this fantasy of disembodiment precisely that – a *fantasy* – we are less interested in utopian

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<sup>21</sup> To name only a few examples in which this fantasy is articulated: in narrative fiction, William Gibson’s “Sprawl” novels, Rudy Rucker’s “‘ware” trilogy; in nonfiction: Ray Kurzweil’s *The Age of Spiritual Machines*; in film and television: *Max Headroom*, *VR.5*, the *Lawnmower Man* films, *Strange Days*.

scenarios dividing subjectivity from materiality (in our opinion, a nonsensical and philosophically naive aspiration), than in understanding the desires that those scenarios engage and govern. In its positive and negative forms (“cyber-cleanliness” and “cyber-squalor”), the fantasy of decorporealization – and we insist that this is a constitutive element of the tropology of the cleanroom – binds informational subjectivation to informational production. But what sort of subject is a BunnyPerson, we wonder, and what is it celebrating in its frenzied dance? If, as the Intel commercials seem to suggest, the end of embodied labor, then nothing can be done with the made *thingness* of the microprocessor and the matter of the worker’s body. These are precisely, we claim, the resistant remainders of the cleanroom fantasy.

We believe there is a need in this domain for careful, critical investigation of the historical and symbolic antecedents of an emerging Imaginary which is in some senses new (in its compression of time and space), and in others, very familiar (in its replaying of well-worn tropes of the division of the clean from the unclean, the civilized from the primitive.) Within the Imaginary of the cleanroom-as-technologically-perfect-*cordon sanitaire*, subjectivity is constructed by occluding and repelling barriers, and human activity is confined to a definite, idealized space of production, from which every trace of abject materiality – literally, the unproductive stuff of organic life – is excluded. Homologous with its elimination of the messy specificity of the body, these barrier technologies flatten out bodily traits of race and gender – not in the interest of a progressive social policy, but rather in the interest of eliminating every troublesome aspect of the body. They render every BunnyPerson, as it were, equal – at least within the sanitized realm of the cleanroom. (Which is to say, every body is rendered equally offensive.)<sup>22</sup>

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<sup>22</sup> One political-economic sense of the decorporealized order of production is evident in the expansion of the use of the term “cleanroom” within a domain we have not discussed: the legal

The rat persists – the real, to paraphrase Lacan, is that which stays with us stubbornly refusing to be symbolized and so gotten rid of. The rat is the macroscopic, aporetic figure of the contaminating particle that the cleanroom would seek to govern. Unlike Hopper’s moth, its presence cannot be reduced to mere wordplay. Its appetite and intractability point to a sort of pivot in the fantasy of cyber-cleanliness. As in the fantasies of the autochthonic monster and the filthy savage, the fantasies of cyberculture turn on the dual effects of a resistant kernel, marking from one perspective that which must be excluded at any cost, and from another, that which will return as the very thing defining the logic of exclusion. We propose that a crucial task for theorists of cyberculture is not to try to think past that kernel, but rather, to reconceive the spaces of technological, economic, and political subjectivation in ways that take account of their irreducible inconsistency: the mutual constitution of their horror and pleasure.

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discourses of intellectual property. Reverse engineering of a competitor’s product is often performed under so-called “cleanroom” conditions, meaning that no data which might be traceable to the competitor’s technologies or employee know-how is permitted to “contaminate” the engineering process. Obviously, there is room here for further investigation of the semiotic constellation joining cleanliness (as in *propre*) with “property.”

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