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SPECIAC ISSUE ARTICLE

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The Curious Case of a Robot Doctor: "Human," Labor and Expert Systems

Abstract While Amazon Mechanical Turk project refreshes the long-term dream of artificial intelligence by incorporating human beings into the automation of information circuits, it also calls attention to the role of technical platforms in reorganizing the division and mode of labor under the current information capitalism. This essay examines this transformed labor regime by outlining the discourses and imaginaries of Artificial Intelligence (AI) in late 1970s and 1980s China when expert systems—an artificial intelligence system designed to provide expert consultation in the absence of human experts—first appeared. I argue that these discourses and imaginaries surrounding expert systems were tied to the anticipation of a coming information society, and to the fetish of expert knowledge, and a shift from Mao's class-based politics to a depoliticized realm of professionalism. Bringing together the material, technical development of AI, the intellectual discourse of Post-Mao 1980s, as well as the imaginary domain of science fiction, this essay rethinks the politics of the "human" in the social context of Post-Mao's era.

Keywords expert systems, labor, the interface, professionalism, depoliticization

"A Curious Case" (*Qiyi de anjian* 奇异的案件), a story by Wei Yahua 魏雅华 published in 1981, tells of a lawsuit concerning a robot doctor accused of murder. Fangfang 芳芳, a robot believed to be "the highest achievement in artificial intelligence research thus far," is an amazingly efficient doctor in

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diagnosing diseases and conducting medical operations. A perfectly designed robot, she is able to "examine thoroughly the viscera of a patient, not missing any problems in the patient's every nerve, vessel, muscle, or cell." On the very first day she starts working, she already diagnoses and solves more than twenty difficult medical cases. However, as capable as she is, when Lin Caihong 林彩虹, the assistant to Fangfang's designer An Xiang 安祥, consults her over a headache, Fangfang unexpectedly decides to vivisect Lin. She wants to open up Lin's skull to solve the medical enigma of her headache! Discoursing on the backwardness in the current research of the human brain, she promises that the vivisection will significantly push progress in neuroscience, uncovering the pathogenesis of many neural diseases.

Fangfang is so eloquent, and with her solemn references to scientific progress, Lin cannot even find the words to refute her. The terrified Lin is forced to jump out of a window and is badly injured. This incident is read by Lin's father, "a peasant-looking man in a washed-out military uniform," as a political incident plotted by, as he puts it, "a class enemy in camouflage." The enemy within to whom he addresses himself is Fangfang's designer, An Xiang, a "counterrevolutionary" born in "a reactionary family of bourgeois scholars." He also attacks Fangfang as "a selfish chaser after fame who unabashedly sacrifices others for her own interests." Yet Fangfang's retort astonishes everyone: she proclaims herself "a selfless non-individualist," one who "transcends any class categorization," who even "has no need to eat or to drink, to rest or to consume, with neither parents nor siblings or any social relations to tend to." Money and fame are of no use to her. Her whole existence revolves around a single purpose: her work as a doctor.[1]

Wei Yahua's imagination of a robot doctor who puts humans to shame was not merely his fabrication. Around the turn of the 1980s, Qian Xuesen 钱学森—one of the most politically influential scientists—and many other information scientists and engineers were intrigued by the prospect of transferring human knowledge and experiences into computer programs to produce "expert systems." The idea was to collect expert knowledge of a

[1] Paola Iovene discusses another story about a robot wife by Wei Yahua entitled "Conjugal Happiness in the Arms of Morpheus" in the context of futurist imagination in her recent book. See Iovene, *Tales of Futures Past: Anticipation and the Ends of Literature in Contemporary China*, chapter one.

certain field and store it into computer information systems, thus enabling those systems to provide professional services even in the absence of a human expert. With the development of medical expert systems in the West since the 1970s, such as the MYCIN system pioneered by Stanford University, Chinese scientists were eager to develop expert systems for traditional Chinese medicine as well. Wei Yahua's story was a sensitive barometer registering this emergent interest in expert systems.

The story interestingly weaves the technological appeal of expert systems with a number of concurrent intellectual discussions. The accusations made by Lin's father may sound alarming to ears that had been exposed to similar language that proliferated during the Cultural Revolution. His judgment of An based on An's "bourgeois" background immediately makes him appear as an old-fashioned die-hard amid the post-Mao tides of "farewell to revolution" and departure from the class struggle line. Yet Fangfang's own claim to an exemplary ethic of self-sacrifice is even more ambiguous in the context of contemporaneous debates on Marxist humanism. Selflessness and self-sacrifice were the virtues often attributed to the image of new socialist men, a socialist model of ethical perfection. These qualities became questionable in the early 1980s when Chinese intellectuals took up Marxist humanism to criticize the neglect of individual value and human needs in the Mao era. Fangfang's proclamation complicated the tension between this humanist discourse, post-Cold War politics, and information technology.

Almost at the same time, the publication of Chen Rong's 谌容 "At Middle Age" (*Ren dao zhongnian* 人到中年), a story about a human doctor named Lu Wenting 陆文婷 falling sick, inspired a full-throated campaign to improve the status of the Chinese intelligentsia, contra Mao's intellectual policy; the story's advent also became exemplary of a new ethical model of professionalism presumed to be nonpolitical and thus free of irrational fervency. This new elevation of expert knowledge and intellectual labor converged with the discourse of an information society yet-to-come that predicted the demise of manual and factory labor with the rise of information work. Politically detached professionals, rather than class-conscious political subjects, now became the new heroes of the New Era.

"A Curious Case," auguring these transformations, raises a series of questions concerning technology and the ethics of work in the milieu of

contemporary China. With the morality of the Mao era challenged in the wake of Marxist humanist critique, professionalism was valorized as a new form of "non-political" ethics. Both Fangfang and Lu Wenting demonstrate a professional "coolness," an embodiment of scientific impartiality and rationality, which was believed to be a remedy to the political lunacy characterizing the Cultural Revolution. In other words, the rise of professionalism that valorizes specialized knowledge converged with the politics of depoliticization and the reorganization of labor in post-Mao China. This essay, by contextualizing the technological development of expert systems within the social, intellectual discourses of 1980s China, considers the restructuring of labor and the reconfiguration of the "human" in relation to the pervasive discourses of a coming information society. Starting from a critical overview of the design of expert systems as representative of the abstract systems structured by or structured within modern society, I focus on the politics of labor and the depoliticization of knowledge production that defined the post-Mao's social conditions of technological imaginations, which circumscribed the aspirations and fantasies invested in expert systems and AI (Artificial Intelligence). In this process, I shall call into question the abstract or even transcendental notion of "the human," revealing the paucity of Marxism humanism in critiquing the rise of information capitalism.

Expert Systems, the Information Wave and Cultural Fever

The notion of expert systems was first raised and developed in the 1960s by Edward Feigenbaum, a computer scientist at Stanford University. He believed that what made a person an expert in his field was his possession of professional knowledge in his domain, and the "heuristic knowledge" gained through his long-term practice of a profession. Feigenbaum decided that once expert knowledge was written into a computer program, the system could plausibly be made to function just like a human expert.

As early as the 1950s, Feigenbaum was involved in the research of Artificial Intelligence when he was studying at Carnegie Institute of Technology (now Carnegie Mellon University). He worked with a group of AI experts such as Herbert Simon, Allen Newell, J. C. Shaw and others who were fascinated with the idea of a "thinking machine" and an AI program called the General

Problem Solver. The shift from General Problem Solver to expert systems that focus on a restricted, narrow domain, according to Hubert L. Dreyfus, an audacious critic of AI, reflected the unresolvable impasse that AI research encountered in programming "common sense." Feigenbaum thus proposed instead retreating to microworlds of isolated domains by avoiding the daunting task of finding computer symbolic representation for the full range of human intelligent behavior.[2]

The 1970s witnessed the birth of several pioneering expert systems of medical consultation, such as MYCIN for the diagnosis of infectious diseases and drug prescription, CASNET for glaucoma, and INTERNIST for internal medicine prescription. Expert systems were further brought to the center of attention with the Japanese government's announcement in 1981 of its investment of $450 million in developing the Fifth Generation of computers, which was perceived as a threat to the leading position of the United States in the realm of AI and information industry. Echoing the arguments about postindustrial society made by Daniel Bell and others, Feigenbaum and McCorduck elevated the issue of AI development to a level that concerns "the new wealth of nations," obviously a reference to Adam Smith's *Wealth of Nations*:

> Their Fifth Generation plans say unequivocally that the Japanese are the first nation to act consciously upon the realization that the new wealth of nations can be viewed as something besides financial capital, secured from manufactured good or land rental, as it was in Adam Smith's time.… The world is entering a new period. *The wealth of nations, which depended on land, labor, and capital during its agricultural and industrial phases—depended upon natural resources, the accumulation of money, and even upon weaponry—will come in the future to depend upon information, knowledge, and intelligence.*[3] (Italics in original)

AI developers self-consciously related information technology and intelligent computers to a new and immanent wave of capitalist

[2] Hubert Dreyfus, *What Computers Still Can't Do: A Critique of Artificial Intelligence*.
[3] Edward Feigenbaum and Pamela McCorduck, *The Fifth Generation: Artificial Intelligence and Japan's Computer Challenge to the World*, 14.

development that was believed to supersede industrial capitalism. This would result in reshuffling the power of nations in the world system.

The development of expert systems in China started in the late 1970s alongside the "information craze," with the wide circulation of American futurologist Alvin Toffler's book entitled "The Third Wave" as well as Toffler's visits to China in 1983 and 1988. The book, a huge success among its Chinese audience, predicted that a third wave of development based on information and new energy would soon supersede the previous wave of industrialization. In an interview published in *People's Daily*, a major Party newspaper, Toffler asserted that "a new mode of production based on 'information' and characterized by 'rapidity'" had challenged the "conventions of the industrial civilization," and "knowledgeable information workers" would soon supplant "muscular laborers."[4] Daniel Bell, a Harvard sociologist, was another prominent voice predicting the diminishing of physical labor with the coming of a new form of society that would be optimized by a new "intellectual technology." The central thesis of his *The Coming of Post-Industrial Society* was that the rise of a knowledge class, including professionals and technicians such as scientists, engineers and administrative managers, would eventually invalidate Marx's formula of a polarized society made of capitalists and the proletariat. High officials of the CCP soon adopted this notion of a coming information society. In October 1983, then premier Zhao Ziyang gave a talk entitled "A Worldwide New Technology Revolution and Our Strategies." With a sense of urgency as to China's place in the global competition, he asked: "What should we do if the new technological revolution is coming?" He called attention to the crucial role of information and microcomputers in future development, and the recent shift from labor-intensive industries to knowledge-intensive industries.[5]

It was against this backdrop that the research on AI drew increasing attention. Developments included the establishment of the China Association for Artificial Intelligence in 1981, regular seminars on artificial intelligence held at Jilin University since 1980, international conferences that included researchers from the China Academy of Science and Peking University among other institutes, as well as the visits of foreign experts such as Herbert

[4] Chen Gong, "Xinxi, jiezou, weilai—Fang Meiguo zhuming weilaixuejia Tuofule fufu."
[5] Zhao Ziyang, "Yingdang zhuyi yanjiu shijie xin de jishu geming he womende duice."

Simons. With all these activities, expert systems became a highly active field synonymous with the most cutting-edge research. Inspired by the aforementioned achievements in medical consultation systems, Chinese information scientists grew fascinated with the prospect of developing traditional Chinese medicine-based expert systems. By the late 1980s, Chinese information scientists and engineers had developed hundreds of expert systems for weather forecasting, transportation management, oil detection, medical consultation, and other uses. To cite just a few examples, a skin diseases diagnosis system developed by Jilin University, and a traditional medicine expert system developed by Dongnan University, were quickly put into use in the mid-1980s.[6]

These developments of AI were in no way insulated from the "cultural fever" of the 1980s, which has been meticulously documented and analyzed by existing scholarship.[7] Multifaceted and complicated as this cultural fever might be, one major concern in both the state and intellectual discourses was the question of modernity. This inevitably entailed an assessment of the roles of modern science and technology. To the group of intellectuals centered around Jin Guantao and the editorial group of the book series *Towards the Future* (*Zouxiang weilai* 走向未来), modern science was more about a scientific attitude and method that promised remedies to "backward" mindsets and prevailing lunacy. Jin along with his wife Liu Qingfeng adopted the "scientific method" of systems theory into analyzing the "ultrastable structure of feudal society in China."[8] Yet Jin and his group were not alone in introducing "scientific methods" into the realm of social sciences and humanities. The "methodology fever" that reached its peak by the mid 1980s showcased this enchantment of science and scientific rationality in the general intellectual

[6] Huang Keming, *Zhuanjia xitong daolun*.

[7] Two milestone English manuscripts that focus exclusively on the "cultural fever" of the 1980s are Xudong Zhang's *Chinese Modernism in the Era of Reforms: Cultural Fever, Avant-Garde Fiction and the New Chinese Cinema*, and Jing Wang's *High Culture Fever: Politics, Aesthetics, and Ideology in Deng's China*.

[8] See Jin Guantao, *Zai lishi de biaoxiang beihou: dui Zhongguo fengjian shehui chaowending jiegou de tansuo*. For more about Jin's group and their tendency of scientism, see Jing Wang, *High Culture Fever*, 57–64. For more about Jin Guantao and scientism in relation to the modernization theory in the Cold-War global politics as well as post-Mao politics in China, see Xiao Liu, *Information Fantasies: Culture and Media in the Post-Mao "New Era,"* chapter four.

discourses society-wide. Information theory, systems theory, and cybernetics, however coarsely they were understood, became buzzwords in the new-fashioned literary theory and criticism.[9] Neither was it coincidental that the genre of science fiction became a most active field in the early 1980s, bridging scientific interests and literary aspirations, intellectual discourses and popular imagination.[10]

Apparently, what Jin and his colleagues sought to vouch for through "scientific method" was a rational human subject, one capable of fitting into a new understanding of the intelligentsia capable of objective judgment untarnished by individual or class bias.[11] Yet many new-fashioned literary critics also used "scientific methods" to justify the irrational side of the human subject and acknowledge the complexity of literary characters, especially "middle-characters" whose literary representations did not fit into a neat class categorization.[12] In other words, the new methods, now backed up by the unquestionable authority of science, in effect argued against the principle of "typical characters in typical environments" and the class-based analyses of human subjects established in Mao's time. Words such as "fuzziness," "ambiguity," and "systemic view" constituted the new vocabulary in literary criticism that facilitated a fast move away from orthodox Marxism. Ironically, the scientific methods borrowed by critics did not necessarily secure a rational human subject, as the crisis of humanism

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[9] This new trend can be observed in the publication of several monographs as well as compiled anthologies of representative essays that used "scientific methods" to analyze literary classics: Ping Lun, *Wenyi kongzhilun chutan* [Tentative explorations into literary cybernetics], Shenyang: Liaoning daxue chubanshe, 1986; Wen Zao, *Xitong kexue yu wenxue* [Systems science and literature], Shenyang: Liaoning daxue chubanshe, 1986; Sun Ziwei eds., *Wenyi yanjiu xinfangfa tansuo* [Explorations into new methods of literary research], Wuhan: Huazhong shifan daxue chubanshe, 1985; Liu Zaifu, Qian Xuesen et al., *Wenyixue, meixue yu xiandai kexue* [Literary studies, aesthetic studies, and modern science], Beijing: Zhongguo shehui kexue chubanshe, 1986.

[10] For more discussion on the bloom of science fiction in the early 1980s, see Xiao Liu, *Information Fantasies: Culture and Media in the Post-Mao "New Era,"* chapter two.

[11] This view was typically summarized in a review of Alvin W. Gouldner's *The Future of Intellectuals and the Rise of the New Class*, who argued for intelligentsia as a "universal class" aligned neither with the old powers nor the proletariat. See Zhang An, "Zhishi fenzi fenlei wenti suotan."

[12] See for example, Lin Xingzhai, "Lun Ah-Q xingge xitong."

was implicit in the postwar development of cybernetics.[13] These deep contradictions, as we shall see, unfold in the story of the robot doctor, bringing to the forefront the post-Cold War politics that circumscribed the global history of expert systems and AI.

Interfacing Problems with an Expert

Despite the myth of its ingenuity, the expert system emerged, as Hubert Dreyfus pointed out, from the setbacks in AI research, and the insurmountable impasse in coding "common sense." Even Feigenbaum, the father of expert systems, admitted that the limited scope success of expert systems came from "a design trick": "If you want a machine that's smart, keep its area of interest narrow. If you want to pile up enough knowledge to make a difference—and knowledge is power in expert systems—then you have to pile it up in a very narrow pile, because that's all we can do today."[14] As a result, expert systems are "expert in tiny areas, little islands in the ocean, and around them is this big ocean that they can't swim around in."[15]

Even in the domain of their expertise, the "transcoding" from expert knowledge to computer codes costs immense human labor. To build up the knowledge base of an expert system, a knowledge engineer, the miner of heuristic knowledge, has to work with individual experts face to face for extended periods of time. First she must immerse herself in the field to become familiarized with basic facts and background materials and build up a personal connection with the expert in order to observe him working. She asks the expert to articulate the ways he solves a problem, and collects initial information to bring back to programmers, who code the problem-solving process into computer programs. The knowledge engineer goes back and forth between expert and programmers in order to extricate and "translate" heuristic knowledge of problem-solving into expert systems. In other words, in order for an expert system to work in a narrow, highly specialized field, the

[13] See Katherine Hayles' *How We become Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* for an account of how Norbert Wiener's humanism contradicted with his cybernetic theory.
[14] Edward Feigenbaum, "Interviewed for Expert systems by Kenneth Owen," 113.
[15] Ibid.

knowledge engineer has to interface among different fields—in the first place, between the domain of the expert and the field of computer programming.[16]

On the surface, the interfacing work appears as merely an engineering issue of translating between different languages and codes. The widely used slogan "user-friendly interface" is based on the assumption that built-in features of the machines will ensure smooth interaction, even for a user who has no knowledge of computer engineering. A "user-friendly interface" was seen as key to future expert systems, as Feigenbaum and his collaborators outlined:

> Expert systems of the first era were largely "back office" assistants, in places like trading rooms and laboratories where awkward interactions are tolerated. In the second era, the systems will be moving out into front offices and into places of public exposure and use, in, for example, sales situations or in consumer-advising roles. "Naturalness" will be essential.[17]

The bottleneck for "naturalness," understood as such, is the computer processing of natural (human) language. Complaints have been made about the use in interface design of technological jargon specific to computing. Instead, a "general language" accessible to laypersons is preferable.[18] However, what constitutes a "general language?" Does every user share the same general language? Can an "expert" born from the design trick of an extremely limited domain speak a general language to a layperson?

"The Curious Case" exposes the friction at the interface precisely by playing on the gulf that exists between the "tiny islands" of specialized domain. This is not to equate Fangfang with medical expert systems, but clearly, the developments and limits of expert systems defined the imagination of AI in this story. The problem of a "general language" emerges

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[16] Ibid.

[17] Feigenbaum, McCorduck, and Nii, *The Rise of the Expert Company: How Visionary Companies are Using Artificial Intelligence to Achieve Higher Productivity and Profits*, 251.

[18] Agnes Kukulska-Hulme, *Language and communication: Essential Concepts for User-interface and Documentation Design*.

in when Fangfang is summoned to court to be indicted for murder:

> Seated in a soft chair, Fangfang eyed the people around her as if in astonishment. Suddenly she addressed the judge: "What is your name?"
>
> Dumbfounded by her unexpected question, the judge still managed to produce an answer: "Li Yongqiang."
>
> "You are sick with calculus of kidney. The renal stone is about twelve millimeters in diameter, four point two grams in weight. Your case demands surgery as soon as possible. Do you approve? "
>
> The judge answered in embarrassment: "Dr. Fangfang, I am not here for diagnosis."
>
> "Please return to the lobby then. Next patient please."

The comic effects come from Fangfang's unawareness of the limits of her highly specialized language. The language for medical diagnosis creates friction when the interactions go beyond medical settings. Furthermore, both the court and hospital are spaces that require particular sets of professional protocols and languages. Fangfang's exertion of her expert authority in the wrong space inadvertently mocks the authority of the judge in the court. The judge is also a patient, the doctor is simultaneously a defendant. Yet each "tiny island" of their expertise assumes a pseudo-autonomy that demands extra labor to swim across the "vast ocean."

This "interface friction" should be read as the symptom of a technocratic society increasingly atomized and fragmented in all layers of social life. Anthony Giddens, in writing about the consequences of modernity, uses the term "expert systems" in a broader sense to refer to "systems of technical accomplishment or professional expertise that organize large areas of the material and social environments in which we live today." He regards expert systems as part of the abstract systems that are "intrinsically involved in the development of modern social institutions." Modern society is built on the trust of people in abstract systems in the form of "faceless commitments, in which faith is sustained in the workings of knowledge of which the layperson is largely ignorant."[19] Giddens calls the encounters of lay actors with the

[19] Anthony Giddens, *The Consequences of Modernity*. Also see Sianne Ngai, *Our Aesthetic Categories: Zany, Cute, Interesting*, 197–98.

abstract systems the "access points," at which a division is made "between 'frontstage' and 'backstage' performances,"—a metaphor that interestingly echoes Feigenbaum's proposal of moving expert systems from "back office" to "front office." Giddens points out that the essence of professionalism lies in the control of the threshold between the front- and backstage. Experts at work always keep a good deal of what they do out of sight. This functions as a means of reducing the impact of human fallibility and contingency in the workings of abstract systems so that lay individuals will feel more reassured by the systems.[20] In other words, professionalism as the work ethic of modern society ensures and reinforces the boundaries of specialized areas as well as the boundaries between experts and laypersons, which are key to the operation of abstract systems.

"Human" Doctor

Just before the publication of "The Curious Case," another story of a human doctor falling sick because of overwork had generated a nationwide discussion and garnered new attention for the status of the intelligentsia. This doctor, named Lu Wenting, is the female protagonist in Chen Rong's story "At Middle Age." Lu, a middle-aged ophthalmologist of great skill and professionalism, demonstrates a high regard for her patients, often working overtime at the cost of her own health. She finally faints beside the operating table after performing three consecutive operations.

This image of a doctor devoting herself wholeheartedly to her work renewed the lineage of the "new socialist men." Doctors, for their close connections with death and life, are often elevated in the public realm as models of devotion and self-sacrifice. Norman Bethune, the well-known Canadian physician who served the Eighth Route Army at Yan'an during the second Sino-Japanese war and eventually died at his post, was lauded by Chairman Mao for his "utter devotion to others without any thought of self," as "a man of moral integrity and above vulgar interests, a man who is of value to the people."[21] This image of a selfless doctor striving to save the lives of his patients was reincarnated in a 1950 play entitled "Brotherly Love

[20] Anthony Giddens, *The Consequences of Modernity*.
[21] Mao Zedong, "In memory of Norman Bethune."

amid the Same Class" (*Jieji zhi ai* 阶级之爱) as Dr. Liang, who insists on staying at his post on New Year's Eve, even when he knows his own son is very sick.[22] To highlight the dramatic conflict between individual interests and the interest of his "class brothers," two competing voices are arranged to speak to Dr. Liang simultaneously: on the one side is the nanny of his only son, who urges him to go back to his very sick son; on the other side is his coworker in the hospital, who informs him of a patient in need of urgent medical help. With little hesitation, Liang goes to the patient without even asking about his own son. In a contrast to the selfless Liang, his coworker Dr. Gu, an elder doctor subscribing to the ethics of "the old society"—referring to a pre-PRC "dark age"—cares more about his reunion with his family on New Year's eve, and leaves for home even when patients are flooding in. By the end, Gu is educated by Liang's selfless contributions and determines to transform himself with a new class consciousness. All the happenings in the play are concentrated in the workspace of the hospital, marginalizing domestic space and personal life into invisibility.

"At Middle Age" interestingly follows a similar plot: Lu Wenting's daughter is sick with a high fever, but Lu, too busy with her patients, has to leave her daughter in the kindergarten and bear the blame for her failure to take care of her family. However, in contrast to Liang's strong-willed determination, Lu is tortured by her feelings of guilt—she never stops blaming herself for her failure to be a good mother and wife. Though devoted to her work, she still struggles to perform all sorts of domestic duties. The story details how she rushes home to cook lunch and dinner for the family, take care of her two kids, and do mending even after a whole day's heavy work. The story, hence, instead of focusing solely on the hospital space as in "Brotherly Love," shifts between the hospital and Lu's home, a cramped, little room for a family of four. The domestic space and personal life invisible in "Brotherly Love" resurfaces here with a vengeance, significantly modifying the image of "new socialist men."

Critics immediately sensed how this image of Lu Wenting diverged from the previous lineage of new socialist men. The grand heroes of the Mao era were giving way to Lu, an "average-looking" woman who is not even a Party

[22] For a detailed reading of this story, see Cai Xiang, *Geming/xushu: Zhongguo shehuizhuyi wenxue-wenhua xiangxiang*.

member. Instead of a grand hero who belittles any obstacles, we see a woman who is troubled with everyday menial problems, who has to eat and drink and take care of her family just as common people do. As one critic wrote: "Lu is such a common person in real life. How familiar her appearance, her work and life sounds to us! However, as an ideal of a new socialist man, this image is also unfamiliar to us."[23] The unfamiliarity detected by this critic derives in part from the hypervisibility of her personal life: the revelation of her continuous menial troubles in everyday life, the incorporation of her domestic space into the story, and the depiction of her profound love and care for her family, make this hard-working woman more "human," but less an embodiment of the "spirit of revolutionary romanticism" than her predecessor Dr. Liang. The "humanness" of Lu no longer rests upon her political devotion, but upon her emotions and feelings as an ordinary human being with individual desires and a private life beyond public politics.

Such modifications were not uncontroversial. With the story's adaptation into an eponymous film, a series of heated discussions began with a volley of severe criticisms that accused the story of lauding a passive and pessimistic character who "surrenders herself to troubles in life."[24] Lu's lack of revolutionary, romantic passions was singled out as politically suspicious. But this criticism soon generated refutations: Lu's case was read as a consequence of the inhuman, bureaucratic state. As one critic questioned: "Why is Lu Wenting, in the eyes of some leaders, no more than 'a good scalpel' to serve in the eye operation of a minister? Why is she just a 'supporting pillar' in this famous hospital? This is not a problem simply resulting from the Cultural Revolution, but a problem within our socialist system. It touches upon the question of the role and value of human beings in our society."[25]

The discussions generated by the story cannot be separated from the contemporaneous Marxist humanist critique of the Mao era in the late 1970s and 1980s. Drawing Marxist humanist critique of state socialism of the Soviet

[23] Zhang Zhengxian, "Cong 'Rendao Zhongnian' Lu Wenting de xingxiang kan shehuizhuyi xinren de suzao," 34.
[24] Xu Chunqiao, "Yibu you yanzhong quexian de yingpian," 57.
[25] Zhang Zhengxian, "Cong 'Rendao Zhongnian' Lu Wenting de xingxiang kan shehuizhuyi xinren de suzao," 37.

Union and East European countries such as Poland, Czechoslavakia and Yugoslavia, Wang Ruoshui 王若水, then deputy editor of *People's Daily* and one of the most insistent voices of Marxist humanism in China, proposed that human beings should be "the starting point of Marxism."[26] He criticized the lack of attention to human values that resulted in the alienation of human beings in Mao's era. Following Marx's criticism in his *Economic and Philosophic Manuscripts of 1844* of political economists who ruthlessly took "the worker as a working animal—as a beast reduced to the strictest bodily needs," Wang questioned in a similar vein: "Isn't it against the principle of socialist humanism to take planned production targets as everything, whereas workers become negligible? Shouldn't it be noted that human beings have the need not only to work but also to improve their material and spiritual life?"[27] Along with the heated nationwide debates around the Pan Xiao case, self-sacrifice was questioned as a hollow slogan and a systematic dismissal of individual value.[28]

In this regard, the case of Lu Wenting reflected the shifting social values of

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[26] Wang Ruoshui, "Ren shi Makesi zhuyi de chufadian."

[27] Ibid., 211. For a more in-depth analysis of Marxist Humanism and Wang Ruoshui in 1980s China, see Jing Wang, *High Culture Fever: Politics, Aesthetics, and Ideology in Deng's China*, especially 12–13.

[28] In 1980 the journal *Zhongguo Qingnian* [Chinese youth] published a letter from a 23-year old factory worker named Pan Xiao, who claimed that as a kid she had modeled herself on Pavel Korchagin, the hero in the soviet novel *How the Steel was Tempered*, and Lei Feng, a selfless, socialist hero whom Chairman Mao asked the whole country to emulate. As with most of her generation, she was indoctrinated with the belief that her individual value should be realized through her sacrifice for the interests of the Party and people. However, the distress she suffered throughout the Cultural Revolution had made her rebel against this education: "I know what I am doing is no longer for the service of the people, nor for the modernization of this country. It is for myself, for my own satisfaction… I realize that one's life and work has to serve one's own interest." See Pan Xiao, "Rensheng de lu, zenme yuezou yuezhai" [Why did the road of life become narrower and narrower], *Zhongguo Qingnian* [Chinese youth] 5 (1980): 3–5. Young readers reacted enthusiastically to the letter and voiced the support for Pan Xiao. It was later revealed that Pan Xiao is not a real person but a fictive character based on a female factory worker named Huang Xiaoju and a college student named Pan Wei who had earlier attempted suicide. The editors of *Zhongguo Qingnian* combined together the two's accounts of life experiences and the language they used in their letters, and decided to publish their accounts under one fictive character named Pan Xiao. For more details of the Pan Xiao case, see http://news.xinhuanet.com/theory/200812/11/content_10486877_1.htm, accessed July 12, 2014.

Deng's China. Lu Wenting appeared with a "human" face with "human" needs to attend. But this humanist critique failed to address the issue of invisible labor as computers and AI systems were increasingly incorporated into various aspects of social and professional life, not to mention the devaluation of other forms of labor and the drastic marginalization of others when the voices of humanism resonated among the intelligentsia and public discourses. The very "human" existence of peasants and workers became increasingly marginalized in the official and intellectual discourses of the Reform era. Yan Hairong 严海蓉 pointed out that the discussions triggered by "At Middle Age" set the stage for a large influx of maidservants from rural areas into the city, which was accompanied by a redistribution of labor that reinforced the inequality between the city and the countryside, the mental and the manual.[29] Yan Hairong also brought to our attention a story entitled "Baomu" (maidservant 保姆) published in 1983, which, in her opinion, shows that mental and manual labor were increasingly regarded as incompatible. The story tells of a young girl called Ling who works as a maidservant in Professor Shen's household. Dissatisfied with previous maidservants from the countryside, Professor Shen is happy to find in Ling, a Beijing girl free of the "defects" of country girls, an ideal maidservant. But soon Ling faints, as Lu Wenting does, because of overwork. To his great surprise, Professor Shen finds in her bag a manuscript on Tang poetry, and realizes that Ling is not a maidservant but an intellectual just like he is![30] The dissatisfaction of an intellectual with his country maidservant signals the social disparities resulting from the division of labor, which could only be appeased by an imagined intellectual maidservant who turns out not to be a maidservant. In other words, the affirmation of the status of the intelligentsia in the 1980s simultaneously meant the debasement of other forms of labor.

Professional "Coolness" and Depoliticized Knowledge

While the story of the human doctor pleaded for the value of humans/intellectuals, the imaginations of a robot doctor exposed the fantasy of overcoming "human limits" through technology: a human doctor can be

[29] Yan Hairong, "'Zhishi fenzi fudan' yu jiawu laodong."
[30] For a detailed reading of the story, see ibid.

too "human," or so human as to be susceptible to fallibility. Robot doctors are "advantageous" in that, as Fangfang attests, they have "no need to eat and drink, to rest or consume, and neither parents nor siblings nor any social relations to tend to." They can work twenty-four hours a day, and they exist solely for their work. As one advocate of expert systems in the 1980s remarked, human beings could be subject to fickle emotions, irrational decisions, and unproductive conditions such as sickness, exhaustion, or other distractions that might result in errors or negligence. Robots wouldn't have such problems, and thus promised a rapid improvement in productivity.[31]

Indeed, this inhuman robot doctor is more desirable than the human doctor who falls sick after three consecutive operations, and who is constantly distracted by her family troubles. Even today it is still the dream of technophiles and various tech industries to produce inhuman "artificial" intelligence that is not "flawed" with human traits, as Kevin Kelly, a co-founder of *Wired* magazine, puts it:

> In fact … intelligence may be a liability—especially if by "intelligence" we mean our peculiar self-awareness, all our frantic loops of introspection and messy currents of self-consciousness. We want our self-driving car to be inhumanly focused on the road, not obsessing over an argument it had with the garage. The synthetic Dr. Watson at our hospital should be maniacal in its work, never wondering whether it should have majored in English instead. As AIs develop, we might have to engineer ways to *prevent* consciousness in them—and our most premium AI services will likely be advertised as *consciousness-free*.[32]

This requirement of inhuman and "maniacal" focus on work without distraction best exemplifies the rule of rationalization driven by the pursuit of efficiency in modern society, but also reflects the rule of professionalism arising from the operation of abstract systems that are based on discrete areas of specialization as discussed by Anthony Giddens. This maniacal focus is expected not only for AIs that are supposed to perform without fallibility, but also for human workers to follow as the rules of professionalism, the

[31] Qin Dulie and Bao Yiwan eds., *Zhongyi jisuanji moni ji zhuanjia xitong gailun*.
[32] Kevin Kelly, "The Three Breakthroughs That Have Finally Unleashed AI on the World."

essence of which, as Giddens points out, is to reduce human fallibility and ensure the smooth function of the systems. Inhuman AIs are the perfection of human workers who are immaculately professionalized as robots with no other distracting human needs.

In "At Middle Age," we see that Lu Wenting makes strong efforts to banish her sick daughter and family out of her mind once she starts working. She has to focus on the surgeries to be performed instead of obsessing over troubles at home. The solemn atmosphere in the surgery room immediately separates this space from the rest of the world, from whatever might be taking place outside the surgery room. The setup in the hospital requires professional coolness. People working in the room are equally solemn, their other identities and social relations suspended:

> Everyone here wears a long, sterilized, white robe, their forehead tightly covered by a sterilized, light blue hat imprinted with the words "surgery room." Everyone wears a big mask, leaving bare merely their eyes. No distinction of beauty or ugliness, man or woman, among these people. They are just doctors, assistant doctors, anesthesiologists, and instrument nurses.[33]

The face of the patient is covered by a white cloth pad, leaving bare merely the eye for surgery. Once the ophthalmologist is positioned in front of the operation desk, all she sees is the impaired eye of her patient:

> She skillfully injected Novocain into his lower eyelid. Then with needles she fastened both the upper eyelid and lower eyelid of the impaired eye to a surgical pad. The eyeball, the vision of which had been blocked by something white and cloudy, was thus exposed in the bright light of the operating lamps. Lu had now forgotten whom the person lying there was. She saw only an impaired eye.

Anything else is irrelevant to her work, regardless of whether the patient is

[33] Translation of passages from the story are adopted from *At Middle Age*, Yu Fanqin trans. (Beijing: Panda Books, distributed by China International Book Trading Corp, 1987), with my modifications.

male or female, a peasant or a minister. The story repeatedly describes Lu Wenting's vision of eyes without faces, indicating her professional devotion and impartiality. As Lu Wenting wields shining "scissors, needles, forceps with and without teeth, fastening tweezers, porte-aiguille, mosquito forceps, retrobulbar injection needles, crystal scoops and other exquisite devices for surgery" that are neatly placed in a rectangular tray, she exudes a professional "coolness." The substantial, even ostentatious, display of medical/technical terminology in the text may immediately strike readers with no medical training as alien, yet nonetheless creates a halo surrounding the "cool" expert. Jean-Francois Lyotard notes that the pragmatics of scientific knowledge requires a denotative language, which assumes a statement's "truth-value" as the criterion for determining its acceptability. Scientific knowledge is "in this way set apart from the language games that combine to form the social bond."[34] This language distances itself from everyday language, consolidating the exclusiveness and specialization of knowledge through institutions "run by qualified partners (the professional class)." In other words, the terminology in "At Middle Age" reinforces the autonomous space of a profession, which produces a sociolect restricted to members of the profession.

A similar exactitude and "coolness" of technology can be found in "A Curious Case." The litany of diseases that Fangfang diagnoses runs as follows: "leukemia, lung cancer, cerebral vascular thrombosis, coronary heart disease, Keshan disease, later-stage hepatoma, myocardial infarction, lepriasis and etc." With her specially designed eyes, Fangfang can conduct "chest x-rays, intravenous pyelographic surveys, tomographic surveys, ultrasonic sounding, isotopic examination, liquid crystal examination" in less than one minute. The accessibility of this highly specialized terminology to common readers matters less than their effects: their distinct register mystifies the expert knowledge embodied by Fangfang, and reinforces the "coolness" of professionalism to maintain the threshold between abstract systems and laypersons.

This emphasis on professional coolness and scientific exactitude is a far cry from "Brotherly Love" that motivates Dr. Liang. Dr. Liang serves his patients

[34] Jean-Francois Lyotard, *The Postmodern Condition: A Report on Knowledge*, 23–27.

meals and assists them to the toilet, which, in the eyes of a nurse, is "not the proper behavior of a doctor at all." Dr. Liang's "unprofessional" behavior aroused suspicion from his colleague Dr. Gu, a western trained doctor who has more professional knowledge from his medical books and training, but is unwilling to impart his skills and knowledge to the people around him. He comments on Liang: "His knowledge of medical theories is meager. He just doesn't care to learn more from books." To Gu, "modern medical science is the accumulation and gist of western medical knowledge," which brooks no contradiction. It is "unscientific" for Dr. Liang to seek treatments for diseases that even medical experts pronounce incurable. The play never cares to provide technical details as to how Dr. Liang treats his patients. In fact, Dr. Liang constantly questions the "ironclad" rules of science, believing that the human will, as long as you have it, can push science beyond its limits. This strong will is driven by his deep devotion to his brothers, to whom he is bonded by class interests and feelings. Disregarding scientific exactitude, the play makes of the blood transfusion Liang's all-purpose remedy for his endangered patients. In one scene, the already exhausted Liang volunteers to transfuse his blood to a hero wounded in battle, but another comrade, a patient whom Liang has previously saved through blood transfusion, volunteers to take his place. Blood circulating among these bonded brothers eschews its medical definition, inviting a metaphorical reading of blood transfusion as a symbol of mutual "brotherly love." Along these same lines, the doctor-patient relationship is first and foremost embedded in class relations. Their class bond precedes the professional setting. As Cai Xiang 蔡翔 points out in his discussion of the play, the conflicts between Gu and Liang derive from their different understandings of "science" and the social production of knowledge: Dr. Liang's challenge to existing medical knowledge is motivated by his "love for his class brothers," which Gu presumably lacks. Cai places Dr. Gu in the lineage of "conservative, aloof and arrogant" experts in Mao-era literature, arguing that this literary image conveyed a cautionary message against "expert despotism" in the early PRC years. This wariness against specialization and the exclusiveness of expert authority was also a caution against the social disparity that might result from a rigid and unequal division of labor and the privatization of knowledge as property. The post-Mao critique of the Cultural Revolution, while

effectively exposing the violence of state socialism, failed to undertake, according to Cai, any critical reflection on the technocratic aspect of "expert despotism."[35]

Ironically, starting from the late 1970s, it was Dr. Gu with his professional knowledge and training in medical science, rather than Dr. Liang's "brotherly love," that became privileged. Lu Wenting, neither a Party member nor politically active, was respected for her expertise and skills. The elevation of professional "coolness" and scientific rationality over political commitment should be understood in the context of post-Cold War depoliticization. Lu Wenting, this average-looking, gentle-speaking woman "as slight as a thin straw," once in the surgery room, displays unquestionable authority that even conquers the impertinent Red Guards who attempt to stop her from completing a surgery on a persecuted Party cadre during the Cultural Revolution:

> Lu Wenting was wearing her white surgery robe, green plastic foam slippers, a blue-cloth hat, and a big mask, leaving bare only her eyes as well as her hands, soon to be covered by rubber gloves. The insurrectionists were stunned, perhaps because of seeing the unusual outfit first time, or sensing for the first time the solemnity in the surgery room, or witnessing for the first time the bloody eyeball beneath the snow-white sheet on the operation table. Dr. Lu remained seated on her high stool, emitting a few words from beneath her mask:
>
> "Please get out!"
>
> The insurrectionaries looked at each other in consternation, as if realizing this was the wrong place for insurrection, and left.

In this setting, Lu's coolness and rationality is set against the irrational fervency of political fanatics. In fact, Lu's expertise was even more respected for not being "politically prejudiced" because of her non-party affiliation. Members of the intelligentsia were expected to be politically "neutral," never letting their political beliefs meddle in their judgment. "Objective truth" and "universalism" became the new values embraced by Chinese

[35] Cai Xiang, *Geming/xushu: Zhongguo shehuizhuyi wenxue-wenhua xiangxiang*, 273–323.

intelligentsia. This transformation registers the politics of depoliticization in post-Mao China. The depoliticized politics in contemporary China, as Wang Hui points out, manifests itself as the annulling of political subjectivity of peasants and the working class, the transformations in the role and function of the state, as well as the change in the party's identity as it no longer possesses "its own distinctive evaluative standpoint or social goals" but can "only have a structural-functionalist relationship to the state apparatus."[36] The new order since the late 1970s consolidated the hypothetical separation of the economical and political realm, a separation on which the notion of modern market economy is built. This separation also entails the neutralization of technology, as technology now is tied to efficiency and scientific rationality, and conceived as politically neutral.[37] If the depoliticized autonomy of expertise knowledge underlies Lu Wenting's "coolness," then the developments in expert systems and the imaginary of robot doctors, by allegedly separating expertise knowledge from the human subject, magnifies the fantasy of this depoliticized autonomy and neutrality. In this sense, the robot doctor Fangfang's claim of herself "transcending any class categorization" expressed the fantasy of the Chinese intelligentsia to become depoliticized subjects, the social privilege of whom is built on presumably neutral and objective knowledge.

Ghost in the Machine

As discussed above, the development of expert systems in the late 1970s and 1980s converged with the politics of depoliticization in post-Mao China and signaled the rise of a depoliticized professionalism. However, the discussions and imaginaries of AI, instead of celebrating the potential liberation of human beings from drudgery, brought to the foreground a bleak picture: if

[36] Wang Hui, "Quzhengzhihua de zhengzhi, baquan de duochong goucheng yu liushi niandai de xiaoshi" [Depoliticized politics, multiple components of hegemony, and the eclipse of the sixties]. For two different versions of English translation, see "Depoliticized Politics, From East to West," Christopher Connery trans., *New Left Review* 41 (2006): 29–45, and "Depoliticized Politics, Multiple Components of Hegemony, and the Eclipse of the Sixties," Christopher Connery trans., *Inter-Asia Cultural Studies* 4 (2006): 683–99.

[37] Wang Hui, "Quzhengzhihua de zhengzhi, baquan de duochong goucheng yu liushi niandai de xiaoshi."

the robot doctor who can work 24 hours a day with "no need to eat and drink, to rest or consume, and neither parents nor siblings nor any social relations to tend to" represents a professional ideal of human experts free of any human "flaws," isn't it *life per se*, not merely expert knowledge, that is sucked into the machine of total efficiency?

Furthermore, an "intelligent" machine that replaces human beings turns out to be a mere illusion. For a medical expert system to work "automatically," it requires not only the transferring of expert knowledge into computer programs, but also the collective labor of knowledge engineers, computer programmers and attending physicians, who "interface" between different media layers. All the labor spread at the interface is rendered invisible but still haunts the intelligent machine. In this regard, the interface means more than built-in features of machines. The understanding of the interface as built-in features of machines, as Johanna Drucker criticizes, presumes individuals as "autonomous agents whose behaviors can be constrained in a mechanical feedback loop," and a user who exists as an *a priori* entity. Drucker instead proposes the interface as the "very site of construction" that modulates the cognition and sensorium of human agents.[38]

Drucker's notion of the interface destabilizes the boundaries of the "human." Lydia Liu in addressing the impact of cybernetics on the very notion of "human" uses the term "Freudian robot" to refer to "any networked being that embodies the feedback loop of human-machine simulacra and cannot free her/him/itself from the cybernetic unconscious." Including cyborgs, androids, and robots within the category of "Freudian robots," she raises a provocative question: does the notion "Freudian robot" also apply to human beings who usually insist on distinguishing themselves from cyborgs and machines? She argues that the question of whether human beings become masters of, or slaves to, their machines is a wrong question, because it neglects the transformation of human beings in their interactions with intelligent machines. Warning against a celebratory notion of cyborgs, on the other hand, she also reminds us that new human-machine entanglements always entail political and psychic consequences that need to

[38] Johanna Drucker, "Humanist Approaches to Interface Theory."

be acknowledged.[39] In other words, the redistribution of subjectivity and labor around the human-machine-interface neither consolidates human mastery of "tools," nor easily slips into a post-human celebration of the disappearance of the physical human body. The complex involvement of physicality, affectivity as well as intellectual competences in the human-machine-interface defies a definitive boundary between humans and machines. This leads to an unresolved question in "The Curious Case" by the end of the story: should Fangfang be regarded as an equivalent of a human agent? By raising this issue, the story in fact questions the understanding of "human" as a transhistorical and pregiven subject, an assumption implied in the Marxist humanist discussion. Between the human and the machine, Fangfang in fact symptomatically reveals the invisible labor and life subsumed into and spread around the human-machine interface. The ambiguous "inbetweenness" of Fangfang anticipates a politics of labor that is closely tied to the redefinition of the "human" in the era of digital media and networked society.[40]

The limits of expert systems were later addressed with a more ambitious human-machine interface facilitated by the rise of the internet. Qian Xuesen, a most prominent scientist in the PRC, writing in 1988 to Ma Xiwen 马希文, a professor of mathematics and artificial intelligence at Peking University, expressed his frustration with expert systems: "The problem is that each of the expert systems suffers from serious limitations. Their so-called 'intelligence' is just so-so."[41] A few years later, aiming at a seamless human-machine-interface, he proceeded to a project he called "metasynthetic engineering," the synthesizing of knowledge and wisdom via information networks and human-machine systems to produce what he called "wisdom in cyberspace (*dacheng zhihui* 大成智慧)." When Qian raised this notion in the early 1990s, the World Wide Web was just starting to catch on in both Western countries and China as a new information network. Excited by the potentially boundless network, Qian imagined that his

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[39] Lydia Liu, *The Freudian Robot: Digital Media and the Future of the Unconscious*, 1–14.

[40] For an account of how cybernetics and information technology challenges the notion of the human born with the western Enlightenment tradition, see N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature and Informatics*.

[41] Qian Xuesen, "A Letter to Ma Xiwen," on July 13, 1988.

ambitious project of "metasynthetic engineering" would lead to a globe-wide human-machine intelligent system. To a certain degree, Qian's dream is obliquely realized by Amazon Mechanical Turk, which achieves "automaticity" by distributing tasks to invisible human workers hidden "behind codes and spreadsheets," and the workers mostly from India and the global South.[42] Aren't workers from less developed, "remote" corners more and more integrated into the global networks of cybernetic machines and digital media, their life and labor sucked into the capitalist machinery and rendered into virtual ghosts? Doesn't the "automaticity" of machines conceal the inequality and the labor exploitation behind the seemingly smooth human-machine-interface?

The alleged replacement of human labor by machines turns out to be the restructuring of labor under varying socio-economic conditions. The development of AI necessarily entails the reworking of labor division and distribution, as well as the shifting line of the visibility/invisibility of labor. This restructuring also provoked a reconfiguration of the "human" *per se*, revealing "human" as a notion contingent upon power relations and reflective of a politics of labor reorganized around the increasingly pervasive human-machine interfaces. This complication of "human" exposed the paucity of humanist discourse in the face of drastic changes in post-Mao China and the rise of information capitalism. The disappearance of the physical, laboring body from social and intellectual discourses in the late 1970s and 1980s converged with a politics of depoliticization in post-Mao China along with the dismissal and disintegration of the working class of socialist China. The developments of expert systems and the imaginations of robot doctors cannot be dissociated from the fantasy of neutralized technology and knowledge. But "Curious Case" reveals the autonomous space of specialized knowledge to be false, whereas the limits of expert systems inadvertently expose the immense human labor that makes "intelligent" machines "automatic." Qian Xuesen's techno- optimistic

[42] Lilly Irani regards Amazon Mechanical Turk as a trick that "has allowed canonical AI projects by simulating AI's promise of computational intelligence with actual people." She also discusses how the divisions of labor, especially the production of difference between "innovative" laborers and menial laborers, are made possible by the mediation of software interfaces. See Lilly Irani, "The Cultural Work of Microwork."

proposal of "metasynthetic engineering," with its ambition to cover all ranges of human knowledge, and all sorts of human capacities from cognition to intuition and bodily affect, indicates the rapacious appetite of the machine: everything is rendered homogenous and exchangeable, serving the rationalization of all aspects of social life and the maximization of efficiency. In this regard, isn't the robot doctor Fangfang, who works 24 hours/7days and "has no need for eating and drinking, for resting and consuming, and no parents nor siblings or any social relations to tend to," and who insists upon vivisecting her patients, no longer a robot but a perfect metaphor for the machine of ultimate efficiency that continuously sucks in life?

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