Meritocracy and Feminization in Conflict:
Computerization in the British Government

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In 1992, the Commission of the European Communities tackled the issue of women's under-representation in jobs created by the proliferation of new digital information technologies. The University of Wales researcher who produced the report was especially concerned with the dearth of women in positions of power and responsibility, but not simply because of the negative effect this state of affairs had on women. Her report showed how culturally constructed gender roles in Britain, and European society more broadly, tended to focus only on men's technical competence. As a result, a powerful popular image—sometimes accurate and sometimes not—of technically incompetent or maladept women workers both fed a cycle of perpetual skill shortage and encouraged low technical achievement for women as a group.[i] In attempting to offer solutions to the problem of skill shortages in information technology fields like business computing management, programming, and systems analysis, the report postulated an important connection between skilled labor shortfalls in the technology sector and the under-utilization of female labor in those fields.

By the time this report was commissioned, the field of computing had already acquired a distinctly masculine image within British society. So much so, that as Cynthia Cockburn, an influential labor researcher noted, "for a woman to aspire to technical competence is, in a very real sense, to transgress the rules of gender."[ii] Despite decades of equal pay and significant investment in educational strategies designed to change this situation on both sides of the

Atlantic, patterns of female underachievement and the perception of female technical maladroitness persist within Anglo-American culture, business, and higher education.

Yet, however seemingly timeless and enormously powerful, the idea that the history of computing is a de-feminized realm is belied by multiple, important historical examples. British computing labor in the sprawling public sector, for instance, contradicts this image, while offering insight into why this perception took hold. The history of computing in the British civil service and nationalized industries reveals how computing was first institutionalized as a feminized sphere of work, and then very self-consciously re-engineered as a field of masculine endeavor. The reasons for this change, while historically specific, shed light on many of the widespread biases and processes of institutionalized discrimination that still influence hiring and industrial policy on a macro level.

Gender as a Category of Historical Analysis

Queer theorists like Judith Butler have convincingly argued that gender, as a category of social difference that structures society, is not a static category but a performative one; one that by its very nature requires change and reinterpretation in order to retain its analytical and cultural utility. Gendered mores have the ability to help construct and order social relations as historical circumstances change. Yet, as a set of relational categories made real by social performance, gender can neither be understood as something natural and unconflicted, nor as something consciously assumed by individuals choosing freely between identities. Rather, gendered categories are an aggregate of constantly-changing cultural understandings and social negotiations which, far from being purely descriptive, strongly tend to produce the phenomena they set out to describe.

This discursive model of gender analysis—wherein description and reiteration of categories, standards, and ideals tend to produce their own subjects—also means that "power is not only imposed externally but works as the regulatory and normative means by which subjects are formed."[iii] One need only recall the furor over the remarks made by the previous president of Harvard regarding women's lack of technical and scientific ability for a recent example. The fear that his comments, however unsupported, might help reinvigorate a powerful discourse of women's scientific incompetence by virtue of his prominent position, shows how discourse is widely understood to be not merely descriptive but in fact generative.[iv] Gendered discourses have the power to create categories that structure society, and often determine how people navigate a wide range of social, legal, and economic interactions.

Figure 5.1: Gendered practices and the structure of society

At a Day, Inc., sportswear factory in 1972, man with computer-output-microfilm equipment

(above) controls women production workers (below) "on a projected-requirement basis."

Courtesy of Charles Babbage Institute.

The perception of a masculine ideal for computer workers is, in and of itself, an issue that researchers, educators, and even businesses have recognized as a critical stumbling-block for women's entry and advancement in high technology fields. Even when women enter and advance, such ideals can suppress full recognition of their contributions. As a result, a historical period in which computing was not yet a "man's job" can offer important insights into how and why this masculine ideal was self-consciously constructed. In the case of the British public sector, management believed that undoing the long-standing feminization of the data processing workforce was critical to the success of the government's computing projects.

The British Example

With its sprawling civil service, nationalized industries, National Health Service, and dozens of far-reaching social insurance and welfare programs, the British government required ever greater data processing power throughout the twentieth century, both in terms of computing machinery and human labor. By the 1970s, Britain expended more than 40% of its gross domestic product on the public sector, and created data-intensive services as part of the cradle-to-grave welfare state that could not have existed without early and brisk integration of electronic computing.[v] The size, scale, and importance of computing to the British state makes computing in the British public sector a critical historical laboratory for analyzing computing labor patterns. Computing took many forms under the auspices of the government, and as a result, the similarities in gender discrimination across the British public sector are instructive.

These patterns are all the more relevant to current experience because of the British government's long-standing commitment to equality of pay and opportunity in the civil service. Since the 1950s, women who worked in the public sector had received equal pay. The

government's employment practices were the apogee of meritocracy in a nation that did not

adopt equal pay industry-wide until 1975. Yet, the "fair field with no favor" of the civil service

and nationalized industries was an ideal that could not translate directly into reality.[vi] The

conflict between meritocratic ideals and the reality of hiring practices and workers' lives created

a situation where seemingly equitable policies had very different effects on men and women. The

history of this computing labor force therefore holds applicable lessons for other high technology

workforces constructed within the varied, but often broadly similar, institutional and cultural

molds of Anglo-American tradition.

From Pre-electronic to Electronic Computing

The pre-electronic history of data processing in Britain represented a firmly feminized field of

endeavor in the early and mid twentieth century. Perceived as rote, deskilled work, women

trainees were hired exclusively to operate and program the machines that performed payroll,

accounting, and even scientific computations. This association of women workers with technical,

machine work might seem to fly in the face of cultural stereotypes. Yet, by constructing

technical work as being at odds with the intellectual work of government officers, managers'

association of women with this work did not break down any barriers. Instead it served to

strengthen them, limiting women to lower-level jobs with little responsibility over others and

little room to advance.

These "machine grades" were so dominated by women workers that prior to 1954, when

the government granted equal pay to its own employees, the machine grades were explicitly

labeled a "women's grade." Hiring focused exclusively on female recruits. After 1954, the grade

remained feminized, but the women's grades instead became known as the "excluded grades,"

because they were excluded from the provisions of the Equal Pay Act. Arguing that the wages of

the very few men working in these jobs were erroneously high, the government determined, with an eye to their own economic advantage, that the lower, women's rate for machine operation was the fair market price for the labor. Only women in the higher classes of the civil service, where men worked in equal or higher numbers, were entitled to pay equalization. Yet, the wages of the men within the excluded grades were not lowered to the women's rate. Instead, their job titles changed. As a result of this inequitable equal pay plan, a large proportion of women working in the public sector did not benefit from the change. Rather, the association of women with deskilled, low-paid, and usually dead-ended machine work became institutionalized.

Located firmly below clerical workers, those whose jobs depended on office machines formed a sub-clerical, feminized underclass of liminally white-collar labor. Although performed in an office, the association of these jobs with machinery meant that they were often seen as more aligned with the manual work of a factory than the intellectual work of an office. Many managers viewed the work as relatively unskilled, even though some recognized that this was not the case. Only as more expensive and complex electronic computers began to creep into government offices did this negative perception slowly began to shift.

Figure 5.2: Office machines and feminized labor

Data entry on punch cards gendered as female labor. In 1971, Univac's verifying punch

combined keypunching and verifying of data. Courtesy of Charles Babbage Institute.

For instance, women doing computation in the Aeronautical Research Department as Scientific Assistants in the 1950s used a variety of specialized tools, including electro-mechanical and digital computers for which they coded complex mathematical problems. Yet, these jobs were considered low-level and led to a career dead end. When considering the idea of making a long-term career for computing workers in 1955, the department reported: "Boys generally prefer laboratory work to computing… this might be due in part to the absence of any recognized career in computing and of any suitable specialist courses or qualifications; if this be true it may be possible to make computing into an attractive career for some boys if current plans come to fruition." Simultaneously, the report noted that "a high proportion of the [Scientific] Assistants are girls; this appears to be because they like the routine work. The resignation of a large proportion on marriage certainly eases the problem of careers in computing." [vii] As a result, the young men working in the department were put on laboratory work instead of computing, since there was room to advance there. Meanwhile, the young women remained on computing.

The issue at stake was not one of technical skill, or differences in men's and women's abilities to perform the work at hand, but rather the improbability of keeping young men in a field with no career progression or opportunity for advancement. Women's and men's technical aptitudes did not direct hiring policy; rather, social expectations about men's and women's proper roles in society tended to enforce different job opportunities. This tended to create different career outcomes along gendered lines, even within the civil service's "meritocracy." Feminization of computation work preceded, and helped devalue, early electronic computing jobs in the public sector. The deskilled, devalued perception of the work in turn limited career opportunities and pay, ensuring that the field remained feminized.

In 1955, it was not surprising that young men were regularly considered for different work and better career opportunities than young women. The government had granted equal pay, however imperfectly, to its female employees just one year earlier, and it was less than a decade since the government-wide ban on employing married women had been lifted. What was surprising, however, were the far-reaching and transformative effects of institutional discrimination that coded certain types of opportunities "male" and others "female." In some cases, identical work could be considered different in terms of difficulty and importance depending upon whether men or women were performing it, or expected to perform it.

By the late 1950s, departmental managers expressed concerns that more complex and powerful computing equipment would require a different type of worker: one who would be suitable to manage workers and work flow, not simply deal with machines. Whereas office machine operators and programmers had once been considered low-level, electronic computers had begun to change data processing from an easily-circumscribed endeavor into one whose borders threatened to bleed into administrative, managerial, and long-term planning work. As office computers increasingly became perceived as management tools, management-aspirant staff would be required to function within the data processing system, working with the machines.

Electronic Computing Work Gets an Upgrade

In 1959, the government's Central Tabulating Installation (later renamed the Central Computing Bureau) endeavored to hire operators and programmers from the managerial "executive class" of the civil service to run their new computer. Instead of utilizing the women already present in operator jobs, young men were brought in, because department heads perceived computing work to be increasing in importance and scope. The problem, however, was that none of these

executives had any familiarity with computer programming, or even operation. Each of the hires was "new and inexperienced" and would "require a long period of training and 'running in'" for the first six to nine months. [viii]

Undeterred, the head of the tabulating installation hired several executive class programmer trainees to run the computing section. The programming work, however, would continue to be done by a senior machine operator already in charge of programming and orchestrating workflow for the electronic computer. Described by her superiors as having "a good brain and a special flair for this type of work," she would be responsible for training the new male, executive-level programmers, as well as doing all the programming and testing of programs. [ix]

Yet instead of gaining a promotion, she would only receive a temporary bonus in pay. Eventually, she would be demoted to an assistantship position under her former trainees: "We can leave the senior machine operator on programming until the supervisory executive officer recommended for [programming] in our report is fully trained, say 9 months, and then replace her with an executive officer… [she] will eventually become an assistant to the executive officer on programming work, " reported the department heads' meeting minutes. [x] This senior machine operator was not allowed to take up a supervisory post, despite holding all of the requisite technical skills. As a woman, and as a machine-grade operative, she was seen as not suited for higher responsibility, nor capable of supervising men. These perceptions of her non-technical potential scuttled her chances of ever being on an equal footing with her new trainees.

By 1961, government hiring managers administered specially-designed aptitude tests for machine operator hiring, with an eye to finding not just good operators but potentially good programmers as well. Departmental managers initially felt that "the operation of computers was

expected to be similar to that of punched card equipment and thus proper to SMOs [senior machine operators],"[xi] but soon this gave way to the idea that computing jobs were too complex and required too much training to warrant the continued use of the feminized labor in the senior machine operator class.[xii] Technical skill and aptitude, once again, were not the main concern; the primary issue at stake was wasting training for more complex automatic data processing machines on a workforce expected to have high turnover and short working lives.

Programming as a Management Tool

As operator work increasingly became separable from programming work, the central government began to develop more specific hiring standards for programmers. A 1962 overview of government computing policy reported that the government aimed to recruit most programmers from the ranks of the 70,000 workers within the executive class. Over 90% of executive class workers were male. By contrast, there were roughly a quarter of a million workers in the largely female clerical and machine grade classes. In 1963, 70% of the workers in the machine grades worked in computing installations, making computing operation a firmly feminized job class.[xiii]

Workers in the executive class were middle managers who dealt with long-term departmental goals and developed more efficient work processes. In general, they had more advanced secondary school training, but they did not have university educations nor any particular skill set commonly associated with programming expertise or aptitude. Explained one organization specialist in the Treasury who helped design the new hiring rubrics: "It was early decided that for most programming of clerical operations one did not need graduates in mathematics or other knowledge of professional standard, but a reasonable level of intelligence and certain aptitudes."[xiv] Management potential, and a broad understanding of the workings of

government agencies, were the key qualities that hiring managers sought in the new computing

workers.

Figure 5.3: Computerization and masculine management

In 1971, Inforex's office system seemed to promise tidy masculine management over female

clerical workers. Courtesy of Charles Babbage Institute.

Not surprisingly, the decision to recruit programmer trainees only from the higher-

powered and more prestigious executive grades quickly ran into difficulties. Implementing the

policy was easier said than done because, in general, it was women from the machine operator

class who had the experience for these posts. While aptitude testing for programming jobs

proved an unreliable measure of recruits' future success, familiarity with the departmental computing installations tended to produce programming trainees more easily.[xv] As the government struggled to computerize as quickly as possible, the management abilities of executive class recruits could only go so far in preparing them for the technical aspects of the work, which required a different set of skills and training. As the amount of time that it took to find and train suitable executives for technical jobs became an increasingly precious commodity, these deficiencies proved to be a major stumbling block.

Popular perception had also begun to shift slightly by the mid sixties. More and more women were joining the workforce, and many married women were staying at work longer than before. The idea that women were unsuitable for careers or any kind of serious work responsibility had begun to be contested by many working women, as well as by journalists, political commentators, and authors of popular literature aimed at the young.[xvi] Increasingly Britain had begun to realize, from the highest levels of government down, that high technology, and the reskilling of their entire available workforce, would be necessary to maintain superpower status as their geographic and economic empire shrank. The "technological revolution" proclaimed by Labor Prime Minister Harold Wilson in 1964 promised to usher in a new, more meritocratic society by leveraging the latest technologies for the good of the country as a whole. Technology in general and computing in particular were to save Britain from its seemingly inexorable slide towards second-rate world power status.

Shifting Ideals in a Crisis-Riven State

Despite the institutionalization of a growing preference for young, career-oriented men for public-sector computing work, the 1960s did not, for the most part, witness a hemorrhaging of women from computer operation and programming jobs. During the mid 1960s, intense high

tech labor shortages and economic turmoil in the country at large pushed broader concerns about shaping a professional, career computing class to the back burner. Though women in the government's employ had been nominally given the same rate for the job as men, inequality of opportunity meant that women civil servants generally clustered in lower level and less well-paid positions, meaning that they were often less expensive to employ. Even well into the 1960s, many government departments still regarded programming as appropriate work for higher machine operator posts, a logical progression from lower level machine operator work.[xvii]

From the 1950s on, Britain's gross national product had grown slowly, outpaced by the economic growth of continental rivals. At the same time, former colonies and commonwealth trading partners increasingly turned to the United States for consumer goods. Successive British governments attempted to reverse the poor trading situation through technological modernization geared to increase production for both domestic and export markets. These measures, however, could not produce a quick or dramatic enough change in the nation's economic outlook, and Britain's power on the world stage continued to decline.

By the summer of 1965, an economic crisis had sharpened enough to necessitate a government pay freeze and an expenditure reduction policy. This policy required deferring computer purchases unless they effected major reductions in civil service labor costs.[xviii] Government cost-benefit projections nearly always claimed that savings would accrue from new computer installations, despite the fact that these expected savings had repeatedly failed to materialize. Nonetheless, the idea that large computing installations were somehow economical influenced government purchasing during economic downturns. Since there was little room for savings on the cost of machines, labor cost was the only fungible aspect. Throughout the mid 1960s, a period when the British government was buying ever greater numbers of computers,

economic crisis consistently shadowed the government. By November 1967 the pound had to be

devalued against the dollar for the second time within two decades, a move that failed to quell

inflation or give British exports the necessary boost. [xix]

In the face of these difficulties, government computing installations altered their

recruiting and training tactics. The pay scales offered, hindered by the government pay freeze,

were not competitive with industry. The most desirable candidates—bright young men with

career promise—would be unlikely to gravitate to civil service computing jobs. In 1964 and

1965, as public sector computing projects ramped up, the programmer shortage became so acute

that hiring managers were ordered to make recruiting concessions, while still confining job calls

for programming trainees to the higher grades of the civil service.

After one call for applications met with little success, it was reissued with assurances that

applicants who "did not make the grade as programmers" would be allowed to return to their

previous posts.[xx] While this was a procedural nightmare, and a plan that would potentially waste

an enormous amount of money training unsuitable candidates, it was also an apparent necessity

in coaxing people to apply. In addition, hiring managers had to add a paragraph describing what

a programmer actually did to the job listing: workers outside the machine grades were not

expected to know even the most basic information about the job for which they were applying.

Finally, they lowered the minimum age for promotion to the executive class from 28 to 25,

changing the fundamental promotion structure of the entire civil service in order to cast a wider

net for a specific kind of programmer trainee.[xxi]

Yet, as one executive in charge of finding programmers pointed out, suitable candidates

were likely not to be forthcoming because of apprehension among higher civil servants that

volunteering for such work would stall their careers: "There is a fear among staff… of getting in

a 'backwater'" he pointed out. "Could we say," he hedged, "that once on programming an officer

is not likely to remain in this work for the rest of his career?"[xxii] The gender and class intimations

of machine work combined with the uncertain career prospects of computing jobs to frighten

higher-level workers away throughout much of the 1960s.[xxiii]

As a result, recruitment literature and job postings began explicitly saying that these

positions were "suitable for women" as well as for men.[xxiv] Unfortunately, the lack of a

programmer career ladder in the civil service tended to scare the few executive-level women in

the service away from the jobs just as effectively as it had men.[xxv] Women who had risen above

the traditionally female-coded work of machine operation were, if anything, even less likely to

risk their careers in a potentially feminized, deskilled job category. As such, their inclusion in

these job postings did little to enhance the pool of potential recruits. The emphasis on "equality

of opportunity" for women in this case, when little attention was paid to women's low

representation in higher civil service jobs in general, speaks volumes about the continuing stigma

of machine work in the British civil service through the mid 1960s.

In a somewhat ironic twist, the government even considered "a proposal to widen the

eligibility of senior machine operators for promotion to the executive class, and hence for [higher

level] ADP [automatic data processing] work," instead of simply recruiting and training

members of the machine class for programming and systems analysis work from their current

positions.[xxvi] At first glance, this may seem forward-thinking, but in fact it did little to combat the

inequality of opportunity faced by workers in these feminized grades. While such a plan would

have been beneficial for the few female recruits elevated to executive status so they could

continue working in computing at higher levels, it would have again confirmed the low status of

the machine class: only workers who could be promoted out of the class were considered good

enough for computing jobs. This tactic, had it been employed, might also have cemented the perception of computing as a feminized endeavor, and ultimately scared away many other recruits. Realizing that such a plan was not viable in the long-term if they wished to create a cadre of mostly male, management-grade programmers, the government quickly discarded the idea.

Instead, managers redoubled their efforts to recruit young men *and* young women into computing jobs in accordance with central hiring policies. Still, the available applicants within the civil service were not enough, so hiring calls went out in the major London newspapers. One advertisement for work in the new post office computing center showed an increasing willingness to hire and train an entry-level, gender-diverse workforce. This had become a necessity in overcoming the labor shortage born out of the government's inability to compete with the pay rates in industry. The job call made no secret of the fact that experience in related fields was of no import: "Know Nothing About Computers? Then We'll Teach You (and pay you while doing so)" read the advertisement, promising that "Here at the GPO London Computer Center … You can take your first steps into the fascinating world of computers—into a fascinating future as well!" [xxvii]

Individual Opportunities Owing to Institutional Crisis

The advertisement immediately appealed to several thousand young men and women. Asking explicitly for both male and female applicants was a rarity at the time for jobs of this nature. Often jobs that were presented as career opportunities confined their applications to men, while the routine office jobs, with potentially high starting pay but little upward mobility, sought only women applicants. Those who applied had a chance at a life-long post in the civil service, and

perhaps more importantly, paid training in the highly lucrative skill sets required for computing jobs.

While many advertisements that pitched a job to one gender or the other did so by openly asking for either men or women, even greater numbers of advertisements employed subtler language or fine print. Some limited applications by asking applicants to direct inquiries to the company's "Women's Officer." Others warned that night work would be required, intimating that men were preferred. A variety of code words having to do with career opportunity, pension plans, and the possibility for advancement to salaries over £1500, were often used to convey that young men, rather than young women, were the target demographic for a staff wanted advertisement.[xxviii] Women, on the other hand, were targeted with promises of part-time work flexibility, marriage bonuses, sociable outlets at the workplace, and workplaces in districts of London described as exciting, fun, and fashionable—the shopping area of Kensington or the West End theatre district were perennial favorites.

The post office computing job advertisement uniquely combined elements that were meant to appeal to young men and also young women. The thousands caught in the wide net cast by this job listing came from diverse backgrounds, but all were relatively young, since the job call was confined to those under 25 years of age. One of these applicants, an 18-year-old named Cathy Gillespie, was working in a shoe shop when she applied, having dropped out of secretarial college. Another applicant, Anne Sayce, applied for the position from within the civil service where she was already employed in accounting, but she still had to compete along with all the external applicants. At 24, she barely squeaked in under the age limit. Gillespie and Sayce's experiences show the enormous promise and upward mobility possible for early computing workers. Women and other non-ideal recruits benefited from a situation of institutional crisis that

unseated some of the ingrained sexism and classism pervading nominally equitable and gender-blind government hiring and promotion practices.

In the fall of 1965, both women started work at the London post office's LEO III/26 installation, joining roughly sixty other operators spread across three shifts.[xxix] After two weeks of dedicated training, during which time they memorized the functions and machine code in the thick LEO operator's manual, the new operators began work. Roughly half were female, but all were overseen by male supervisors. For the most part, each of them recalled the atmosphere of the job as pleasant, fun, and exciting. It was, Gillespie recalled, "great to be young in a new industry, earning good money and being on a par with the men regarding wages and opportunities."[xxx]

To many, computers seemed like a fascinating new field. A cut above the other jobs available, located neither in the dull world of the office, nor in the realm of the service industry or factory labor, computing work seemed to represent the remarkable new social and economic future that Labour, and the nation, had begun aligning itself with by the mid-1960s. Nor did the reality of the job disappoint. Recalled Sayce, "operating a computer at that time was quite interesting and exciting," a sentiment echoed by Gillespie: "The atmosphere was fantastic and the best bit was that no one knew what I did as it was so new."[xxxi] In addition to being interesting and relatively well-paid, the work had a particular caché and a level of prestige associated with it. Cutting edge technology elevated both the work performed and the workers who performed it.

Yet, gendered proscriptions intersected with class-specific social mores in a variety of ways, and female workers sometimes inhabited confusing social identities at the crossroads. Intangible factors strongly contributed to Gillespie and Sayce's perceptions of themselves and their jobs. Both recalled that the married engineers who were on site to fix the computers thought

female operators were "a bit dodgy" and shied away from them, seeing them as "man eaters." A similar view was held of the women in the all-female punching pool, who were seen as loud and sexually aggressive. Trousers were not allowed attire for machine operators despite the physicality of the job, even though protective attire, like a long "overall" coat, was sometimes supplied. The only exception was that women on shifts commencing after seven in the evening could wear trousers, hinting at the breakdown of gendered norms that night work implied for women. Indeed, Sayce had even been banned from Woolworth's a few years earlier for wearing trousers. At the same time, hemlines were rising, and women were wearing more and more revealing fashions to work.

Even workers doing the same job in the same installation could see their social roles quite differently. Gillespie remembered that women who worked on required night shifts with men were sometimes looked at in a suspicious light: "'What sort of a woman would want to do that?' was the idea," she recalled, adding, "there was also this idea that you didn't indulge in sexual things before marriage." Her former coworker Anne Sayce agreed with her first statement, but not the latter, asking incredulously: "What sixties were *you* in?"[xxxii] Women's real or imagined sexual availability could be perceived very negatively, and potentially damage their careers, even while proscriptions against sexual experimentation seemed to be crumbling.

As female coworkers left to have children, the gender balance of operators shifted, and new female hires did not replace the old. Both Gillespie and Sayce saw married colleagues come back to work after having had children in different, less desirable jobs, and at lower pay. From her own experience applying for the job, Sayce recalled that some workers were more equal than others. In addition to passing the required math and writing tests for the post office job, she had to convince the hiring officers that she would not have children in the near future: "You would

never get the job until you swore up and down that you wouldn't have children."[xxxiii] Male

applicants had to offer no such assurances of loyalty to get the job. In fact, one government

department had all of its new programmer trainees resign their posts upon completion of their

training. They had all found higher-paying positions in industry with their brand new skills.[xxxiv]

The gradual phasing out of female operators in many government installations through

turnover comported with the government's concerns about finding the most appropriate workers

for their professionalizing cadre of management-oriented technocrats. Two years on, with no

room to advance, Gillespie and Sayce both left their post office jobs for positions at the Central

Electricity Generating Board where there was more potential for promotion. Gillespie later used

her experience to make the leap to the private sector, while Sayce soon left the workforce to have

children. Even as working women become more numerous, and working wives more accepted,

employers and British society in general withheld full tolerance. Women often faced significant

stresses and institutional discrimination associated with the continuing belief that their paid work

was incidental, and that the work most appropriate to them was unpaid labor in the domestic

sphere.[xxxv]

Revival of the Ideal of Management Computer Men

The dire high tech labor shortages and the economic crises of the mid 1960s, paired with the

rubric of Labour's "technological revolution," gave women a temporary opportunity to join the

newly-professionalizing computing workforce on a nearly equal basis with men. This equality,

however, would be shallow and short-lived. As economic conditions stabilized and high tech

labor shortages lessened, women in computing would find themselves consigned to less desirable

positions or kept from entering and being trained in the field at all. The resurgence of subtle and

not-so-subtle institutional proscriptions against women holding career-oriented and management-

aspirant jobs meant that women in computing jobs soon became subject to the larger cultural trends acting upon women workers in general. As a result, many women made choices against their own best professional interests, while many others had those choices made for them.

The Royal Air Force's computing installation, struggling to keep its staff as young women computer operators resigned en masse due to "low rates of pay" and "dissatisfaction with the job" soon decided that they needed to hire a different kind of worker—rather than improve the conditions of the job. "Machine operators are required who have no career ambitions and who simply want to earn a bit of money," stated an RAF report. Therefore, "the best bet is the middle-aged married woman."[xxxvi] Women were perceived to be technically proficient but they were not, in general, considered the best or most likely candidates for computing careers. As a result, the RAF focused on hiring women who had no expectation of career progression, rather than improving pay and promotion prospects to hold onto their young, female workforce.

Conversely, young men were never expected to take professional jobs in which there was no guarantee of career progression. Most organizations in the private sector "recruit young men as machine operators," the RAF noted, "because they offer a complete career to such people, and partly, as was said earlier, because it is felt that the computer field is generally a young man's domain…. The young man seems to represent the 'best bet' if career opportunities and financial rewards are satisfactory."[xxxvii]

That young men represented the "best bet" for computing careers did not always mean that they were the first chosen; indeed, in times of economic crisis or uncertainty, the government simply could not compete with private industry for these workers. It did mean, however, that once financial crisis had been averted, departments focused on hiring young men and groomed them for promotion to management and more complex, responsible work.

Relatedly, once economic conditions permitted the hiring of these "best bet" candidates, existing women workers could be phased out through turnover, or kept in the lowest echelons of the computing-work hierarchy with little opportunity for further training or promotion. By the late 1960s and early 1970s, exactly such a movement was underway in the British public sector.

As economic conditions improved to the point where the government could afford these more desirable candidates, women who had been seen as performing well as computer operators and programmers were often seen as no longer worth the money being paid to them. As late as 1967, the government's Central Computing Bureau noted that they were "pleased to see that the quality" of their "girl trainees" was "still very high," and had begun to send larger and larger complements of machine grade operators for training in the programming language NICOL (Nineteen Hundred Commercial Language). NICOL, a subset of the imperative programming language PL/1, was developed by the British computing company International Computers and Tabulators (ICT) for programming the 1900 series of large mainframe computers upon which the British public sector relied heavily.[xxxviii]

Yet just two years later in 1969, when the government was no longer as constrained by the lean computing labor market of the middle part of the decade, Central Computing Bureau management did an about-face, balking at paying these workers the appropriate rate for their labor on the grounds that they were "unqualified" in comparison to higher-level, non-technical staff who earned similar salaries. The operators at the Central Computing Bureau from 1966 to 1970 made roughly £800 per year, at a time when £1000 per year was a good salary even for professional young men. Extra allowances for speed, specialized skills, shift work, and overtime further enhanced salaries. Some senior operators could make as much, or more than, managerial civil servants who did not do computing work. Nonetheless, the government pay scales attached

to these computing jobs were only at or below fair market rate when compared with the private

sector.

Some of the highest-level managers within the government felt that these "girls" were

getting too much money for their jobs. In addition, these managers wanted to stem, rather than

encourage, the flow of machine operators into higher civil service posts. In the process of setting

up the new Central Computing Bureau, the government had to hire many new, young, female

operators. By 1969, there were already 17 full-time, pensioned senior machine operators there

below the age of 25, and dozens of lower-level computer workers, with more needed. One

manager stated that although he was:

> "…quite satisfied that the machine operators being promoted are fully capable of doing
> senior machine operator work, we are not happy with the size of the group we are
> building up receiving pay on a scale starting at £814 per annum. It is out of proportion
> that these girls, academically unqualified compared with clerical staff, should so quickly
> be able to reach salary levels above those of clerical officers and even executive
> officers."[xxxix]

With no further promotion outlets in the machine operator class, these young women

could theoretically take examinations to move into the firmly white-collar and career-oriented

clerical or executive classes and from there attain positions of much greater responsibility and

influence. In practice, such promotions rarely, if ever, occurred. But even the small chance that

these workers might be promoted into general management and supervision duties alarmed

some. The Central Computing Bureau's hiring manager suggested that "a fundamental and

searching examination of the grading and pay of the machine class is badly needed," if such

young recruits were rising so quickly through the ranks and earning so much.[xl] Meanwhile,

young men of the same age, earning the same amounts, were not subjected to such scrutiny.

These workers were not only young, but still slightly stained by a perception that machine work was only liminally professional. The fact that they were mostly single women exacerbated the situation further. At a time when male Clerical Officers wrote angry letters to civil service union newsletters complaining about how their low salaries meant they could not "afford to keep a wife" or support a family, many civil servants believed that market forces had pushed hiring in an unsavory direction.[xli]

In response to these fewer than 200 computer operators perceived as somehow undeserving of their pay and position, officials actually suggested that all new hires, irrespective of merit, should be subject to new decremented pay scales with a slower promotion track and lower top-level earnings. This unprecedented action went against decades of government agreements with clerical unions, and after severe union backlash, the idea ultimately fizzled. Nonetheless, many promotions were intentionally deferred in an attempt to throttle back the flow of young women into high computing operation and programming positions at the Central Computing Bureau. "Where it is not absolutely essential that we fill posts now, we will defer appointments," wrote the Bureau's manager in early 1969.[xlii]

The Public Face of Government Meritocracy

That same year, the Department of Employment released an animated public service film called "Job for Girls" that implored young women and their parents to take careers for women seriously.[xliii] Between 1961 and 1971, the proportion of women in the workforce had rocketed up by 18%, even as men's workforce participation slightly declined.[xliv] The short film presented the cautionary tale of a woman left to fend for herself after her husband and children were gone. It depicts her rise and fall, beginning when she takes a job in a factory as a young person, earns good money, and has an active social life. She leaves her job when she gets married and has

children, but after raising her children she is left on her own, and has to return to the same low-level factory work that she did all those years ago when she had just entered the workforce.

The film's message, addressed as much to parents as to young women, was clear: society was changing, and women had to adapt. It was no longer the best option for a young woman to get a job that paid well in the short term if it lacked room for life-long advancement. The film attempted to persuade viewers of the wisdom of this course of action, rather than offering much material insight into how girls might go about getting careers rather than jobs, or what sort of work might fit the bill—and with good reason. Embarking on a career was still not as socially respectable an option as leaving the workforce to care for children, and women who attempted such would encounter both obvious and subtle disincentives and discrimination. While well-meaning, the film highlights the schizophrenic paradigm professional women were advised to enact by carefully maintaining (limited) career prospects while spending equal or greater effort maintaining a home or raising a family.

Despite the government's propaganda, the idea of equal job opportunities for women still had yet to gain significant traction in British society. National equal opportunity laws would not be enacted until 1975, and in the 1980s Britain was admonished by the European Court for failing to properly institute the equal pay and equal opportunity measures required by the EEC. Even in new fields of endeavor like computing, which might have been expected to offer escape from old stereotypes, well-established patterns molded work processes and workers' responsibilities. Actions taken by the highest-level ministers in the civil service in regard to new high technology jobs perpetuated the position of men and women in jobs with different prestige, remuneration, and opportunities. Informal segregation of jobs and tasks continued despite long-held ideals of meritocracy within the government service's self-described "fair field with no

favor."[xlv] Young women continued to inhabit an uneasy place in the modern British economy given the conflicting dictates of their roles within society and the family.

In 1970, the government set up a new Automatic Data Processing work grade in the civil service to cater to the pay and career needs of programmers and systems analysts. The decision to exclude the machine operator class from the list of grades whose work would be reviewed and upgraded as part of the process, and also to exclude the machine grades from putting forward candidates for the new jobs in this grade, drew objection from the now largely female union, but the plans moved ahead unchanged.[xlvi] One leader of the Society of Civil Servants went so far as to tell her superiors that "peasant work" was all that was left to the majority of civil servants working in data processing. Her attempts to lobby the government on behalf of her union for changes in how programmer training was doled out, and how certain higher-level computing work was organized, however, went nowhere.[xlvii]

Conclusion

Within machine operation and early computing jobs in the British public sector, women initially held a clear majority. As office computing work gained structure and prestige, government hiring policies began to systematically exclude the majority of the applicable workforce from consideration for the most responsible and difficult-to-staff computing positions. In so doing, the government seriously undermined not only the long-term position of women in Britain's high technology economy, but also the health of the nation's technological projects themselves.

The period in which government computing faced economic crisis and labor shortage provided the most opportunities for women in the nascent field, but this did not produce a long-term institutional change, only a short-term situation that benefited certain, young individuals within a very limited time frame. In some sense, this is not surprising. The exigencies of war, for

instance, have brought women workers into myriad positions in industry that were not considered ideally suited to them—including many of the earliest computer operation and programming jobs.[xlviii] Yet, the ends of such crises usually mark a self-conscious return to previous staffing models, regardless of whether or not women performed the work successfully.

As the economic crisis and high tech labor shortage lessened, a reversion to hiring and promotion best practices that favored young men and management-level operatives, where available, took hold in public sector computing, forcing women applicants to the back of the queue for the most desirable jobs. As Barbara Reskin and Patricia Roos have discussed in their research on feminized and male-dominated fields of paid work, in order to understand why women lose out in the labor market—particularly in well-remunerated or traditionally male fields—we must redirect our inquiry away from the "characteristics of female workers, to the structural properties of labor markets." These labor markets are, for the most part, "shaped by the preferences of employers and male workers" who have the most power in establishing the institutional shape of current and future workforces in the most desirable fields.[xlix]

The association of computing, then as now, with some of the most lucrative and powerful positions in industry will undoubtedly work to exclude women, in the aggregate, from the field; the most desirable workers and managers are still, in general, perceived to be men. Stereotypes about women's technical incompetence, however, seem not to have been an issue in this historical case, proving that women can nonetheless lose out in a technical field even when their technical competence is not at issue. In order to change this bias in the computing labor market, a fresh analysis of the underlying factors that make women seem to be less valuable candidates must occur alongside any increase in the numbers of trained female computing professionals. Then, as now, career interruption or termination due to the demands of family present a major

reason for women's downgraded image, in the aggregate, as valuable and reliable workers. In addition, there is the less tangible issue of women's perceived inability to manage personnel, especially male personnel, as effectively as male managers.

Going forward, it is critical to dispense with the idea that individual bias and individual culpability, on the part of either workers or managers, hold the key to solving intractable problems of under-representation. As this history shows, management acted as a bloc to create different hiring rubrics for men and women, on the assumption that this was necessary for institutional preservation in different economic circumstances. Meanwhile, women's failure to excel in computing jobs was not an issue of individual women not being technically proficient or not wanting to perform technical work, but was rather due to the fact that their work was undervalued as a result of expectations about women's and men's work patterns in the aggregate. In order to change institutional patterns of bias and under-representation in computing, as in any field, the solution requires altering the very gendered ideals upon which men's and women's contributions throughout paid and unpaid work are predicated, and how these contributions are measured. For this reason, the problem of women's under-representation in computing is first and foremost a social problem, rather than an educational, economic, or technical one.

[i] Teresa Rees, *Skill Shortages, Woman and the New Information Technologies* (Luxembourg: Office for Official Publications of the European Communities, 1992), 26-27. Far from being confined to the European context, similar processes have constructed technical skills in other large industrialized, western nations. See Ruth Oldenziel, *Making Technology Masculine* (Amsterdam: Amsterdam University Press, 1999).

[ii] Cynthia Cockburn, "Women and Technology," in Purcell et al., eds., *The Changing Experience of Employment* (London: Macmillan, 1986), 185.

[iii] Judith Butler, *Bodies that Matter* (New York: Routledge, 1993), 22.

[iv] Addressing a National Board of Economic Research Conference convened to discuss the under-representation of women and minorities in the sciences and engineering, Larry Summers theorized that innate differences between the sexes could be a major factor behind women's underachievement.

[v] Cockburn, "Women and Technology," 136.

[vi] *The Marriage Bar in the Civil Service: Report of the Civil Service National Whitley Council Committee* (London: HMSO, 1946): 4.

[vii] Aeronautical Research Council, *Training and careers for computers* (London: Aeronautical Research Council, 1955) DSIR 23/23112, National Archives, Surrey, 2

[viii] Minutes, 20 April 1959 and 20 May 1959, STAT 14/2320 Accounts Division: Combined Tabulating Installation Staff Inspection Report 1958-1959.

[ix] Minutes, 20 April 1959, STAT 14/2320 Accounts Division: Combined Tabulating Installation Staff Inspection Report 1958-1959.

[x] Minutes, 20 April 1959 and 20 May 1959, STAT 14/2320 Accounts Division: Combined Tabulating Installation Staff Inspection Report 1958-1959.

[xi] "Computer Operations Staffing: Note by the London Office" 28 September 1966, AB 46/16 Authority-wide Computer Operations Staffing, 1965-1969.

[xii] Treasury Report, "Government Statistical Services Advisory Committee on Computers," pp. 1-3, 31 August 1967, HN 1/16 ADP Staffing Problems Other than Shift Working 1956-67

[xiii] Confidential letter from D.W.G. Wass in Treasury to P.W. Buckerfield in HMSO, 14 June 1963, STAT 14/2765 Review of machine operator grades 1961-1970.

[xiv] "Electronic Computers 'Oil' the Wheels of Government," J.D.W. Janes, Organization and Methods Department, Treasury, p.11, June 1962, T 216/710 Redundancy Owing to the Introduction of Computers.

[xv] July 1968, ADP Staffing and Projects, HN 1/67 Consultation with Civil Service Staff Association about Automated Data Processing (ADP) 1968-1971.

[xvi] Women trade unionists had long agitated for single and married women workers' rights, but their power to change institutional frameworks and the popular discourse on women's roles in society remained limited in the decades following World War II.

[xvii] Machine Grades: Notes of an interdepartmental meeting held in the Treasury 8 May 1964, STAT 14/2765 Review of machine operator grades 1961-1970.

[xviii] T 224/900 Economic Situation 1965: Deferment of expenditure on capital projects, application to computers.

[xix] Dockyard strikes in 1966 and 1970 frustrated Britain's already-flagging export position.

[xx] Memo from Drake to Shipton, 20 May 1965, LAB 12/1471 Policy Considerations on Recruitment of Programmers and Computer Operators.

[xxi] T.H. Caulcott, Treasury Circular, 12 March 1965, LAB 12/1471 Policy Considerations on Recruitment of Programmers and Computer Operators.

xxii Minutes, June 30, 1965, LAB 12/1471 Policy Considerations on Recruitment of Programmers and Computer Operators.

xxiii In this round of calls for programmers, recruits were accepted from Clerical Grades 3, 4, and 5. By decade's end, only pensioned recruits from Grade 6 were accepted. LAB 12/1553 Shift working of computer operators: applications for vacancies and other papers 1966-1969

xxiv Note from J. Bruce, 25 May 1965, LAB 12/1471 Policy Considerations on Recruitment of Programmers and Computer Operators.

xxv Women made up only 8% of the executive classes in 1970. "Career Prospects for Women Civil Servants," *Civil Service Opinion Magazine: Down Among the Datacrats Issue*, Feb 1970, 52, HN 1/67 Consultation with Civil Service Staff Association about Automated Data Processing (ADP) 1968-71.

xxvi T.H. Caulcott, Treasury Circular, 12 March 1965, LAB 12/1471 Policy Considerations on Recruitment of Programmers and Computer Operators.

xxvii *Evening Standard*, "Know Nothing about Computers?" Staff Wanted Ad, p. 20, July 21, 1965, and p. 18, July 23, 1965.

xxviii Pension plans, when mentioned in an advertisement seeking young employees, were almost exclusively targeted towards young men. Young women generally lost pension rights upon marriage, and therefore, if they opted or were allowed to contribute to a pension plan at all, they would take a lump-sum payout of their contributions in the form of a "marriage bonus" upon finding a husband to help them set up a married household.

xxix LEO, short for Lyons Electronic Office, was the brainchild of managers at the Lyons tea shop and bakery company who parlayed an in-house inventory and payroll automation project

into one of the most successful early British computer companies. The original LEO was based on the Cambridge EDSAC. See Peter Bird, *Leo* (Wokingham: Hasler Publishing Ltd., 1994).

[xxx] Cathy Gillespie, author's interview regarding her work as a computer operator (1965-1968), London, January 5, 2006.

[xxxi] Cathy Gillespie and Ann Sayce, author's interview regarding their work as computer operators (1965-1968), London, January 5, 2006.

[xxxii] Gillespie and Sayce, author's interview.

[xxxiii] Gillespie and Sayce, author's interview.

[xxxiv] Roger Watts, "Down Among the Datacrats," *Civil Service Opinion Magazine: Down Among the Datacrats Issue*, Feb 1970, 42, HN 1/67 Consultation with Civil Service Staff Association about Automated Data Processing (ADP) 1968-71.

[xxxv] Dolly Smith Wilson, "A New Look At The Affluent Worker," *Twentieth Century British History* 17 no. 2 (2006): 206-229.

[xxxvi] P.R. Bixby, Report on Recruitment and Retention of Machine Operators, commissioned by the Royal Air Force, (London: Royal Air Force, 1967) AIR 77/384 National Archives, Surrey, 3, 49.

[xxxvii] Bixby, Report on Recruitment and Retention of Machine Operators, 48-49.

[xxxviii] CCB Steering Committee Meeting Report, 8 June 1967 and 5 June 1968, STAT 14/3303 Shift working of computer operators: applications for vacancies and other papers 1966-1969

[xxxix] Letter from CW Blundell in HMSO (Norwich Computing Installation) to FG Burrett in Civil Service Department, 25 Feb 1969, STAT 14/2765, Review of machine operator grades 1961-1970.

[xl] Letter from CW Blundell in HMSO (Norwich Computing Installation) to FG Burrett in Civil Service Department, 25 Feb 1969, STAT 14/2765, Review of machine operator grades 1961-1970

[xli] Roger Mortensen, "Economic Nightmare," Letter to ed., *Civil Service Opinion Magazine: Down Among the Datacrats Issue*, Feb 1970, 54. HN 1/67 Consultation with Civil Service Staff Association about Automated Data Processing (ADP) 1968-71.

[xlii] Letter from CW Blundell in HMSO (Norwich Computing Installation) to FG Burrett in Civil Service Department, 25 Feb 1969, STAT 14/2765, Review of machine operator grades 1961-1970.

[xliii] From website of National Archives: <www.nationalarchives.gov.uk/films/1964to1979/filmpage_jobs.htm>

[xliv] Men's workforce participation declined by 2%. *Census 1961, Summary Tables*, 64; *Census 1971, Part I,* 1.

[xlv] Civil Service National Whitley Council Committee, *The Marriage Bar in the Civil Service* (London: HMSO, 1946), 4.

[xlvi] "Computers In Government Ten Years Ahead: Notes of an Informal Meeting with the National Staff Side," 21 September 1970, HN 1/22 Report on Development of Computers in Government: Forecast for next ten years 1969-1971.

[xlvii] CCA memo, "Staff in Confidence," 25 October 1972, HN 1/72 Interdepartmental Working Party on Computer Personnel: implementation of recommendations, 1972-1973.

[xlviii] Both the Colossus and ENIAC projects heavily utilized women's labor. For ENIAC, see Jennifer Light, "When Computers Were Women," *Technology and Culture* 40 no. 3 (1999): 455-483.

[xlix] Barbara Reskin and Patricia Roos, *Job Queues, Gender Queues* (Philadelphia: Temple

University Press, 1990), 108-109.