INVISIBLE PARTICIPANTS. WOMEN IN SCIENCE IN AUSTRALIA, 1830 — 1950*

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There is a great deal of contemporary pressure to examine why women are not going into science, to encourage them to do so, and, among a growing band of feminist scholars, to question and challenge the long male-centred structuring and domination of the ethos of science. Deep cultural forces survive that continue to locate most women in the profession's lower ranks; the place of women in science leadership and policymaking in Australia is conspicuously small, while the very architecture of science and its invisible colleges and networks appear to perpetuate the expectation that science is a masculine world. How has this scenario developed in Australia? What part have woman played in the society and community of science? How widespread has their participation been? And what, in a sweep across a century or more, are the inhibitors that have kept women out of 'mainstream' science? This paper examines the background in Australia.

Keywords: women, science, history, gender, botanists, microbiologists, universities, research assistants.

Until recently, the history of women in science in Australia has been a shrouded field. In general, scientific women in all countries have suffered severely at historian's hands. "Traditionally", as one American scholar has written, "history of science has been the least capable of all the histories of acknowledging the contribution of women either to its substantive or to its social development".[1] The stricture is pertinent for Australia. Neither the two major bicentennial publications, Rod Home's *Australian Science in the Making,* Roy Macleod's *The Commonwealth of Science. ANZAAS and the Scientific Enterprise in Australasia, 1888-1988,* nor Boris Schedvin's *Shaping Science and Industry. A History of Australia's Council for Scientific and Industrial Research, 1926-49* (1987) contain the word 'women' in their Index and, conceptually, women are absent from their pages. To date, apart from a chapter, 'The Feminine Touch' in my *A Bright & Savage Land. Scientists in Colonial Australia*[2], some biographical studies of individual nineteenth century women illustrators and artists[3], and Nessy Allen's material on a small cluster of twentieth century women scientists [4], a focus on Australian women in science is only now being established.

Yet the nineteenth century in Australia was a time of remarkable richness in feminine participation in the culture of botanical and natural

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science. In a tradition embedded in 18th century Western culture, upper and middle class women were educated in botany and sketching as soon as the breakfast table was cleared. In Britain and the USA, botany stood as the cultural nexus between popular science and fashion encased in Enlightenment ideas of self-improvement and linked with prevailing beliefs about nature and God.[5] These feminine skills were brought as 'cultural baggage' to the Colonies. They were transported and reared initially in a strange continent where new flora and fauna challenged the eye and brush, and where the illustrations of women served to communicate and enhance knowledge of Australian species. Cultivated women drew, walked, observed, collected specimens, arranged and painted and, through their knowledge and art, became essential diffusers of a botanical culture. Across the century, a cavalcade of women sketchers, collectors, watercolourists, illustrators and botanical writers, responded to and interpreted the botanical and natural history landscape and conveyed their findings to a generalist audience.[6]

Some of these women published their own drawings of Australian flora with accurate descriptions of the plants. Fanny de Mole's illustrated *Wild Flowers of South Australia* published in Adelaide in 1861[7], benefited from Ferdinand von Mueller's scientific aid as did Fanny Charsley's *The Wildflowers around Melbourne* with its explicit botanical nomenclature and descriptions and twenty watercolour plates (London, 1867). Both women were valuable precursors in the botanical identification that came through a professionalising body of scientific men, and their work served to inform audiences on Australian flora in the Colonies and in Britain. "The botanical information at present to be obtained on Australian plants is very scanty", Fanny de Mole summed up in 1861, "...but in this volume we have striven to represent as nearly like nature as possible and have added written descriptions of their growth and peculiar characteristics", while the competent Fanny Charsley evoked a prevailing feminine attitude when she declared, "There is nothing like the study of Nature for amusing the mind and leading us to think of the Great Creator of all things".

A few women had wider lens. The venturesome and articulate Louisa Atkinson and Lousia Anne Meredith carved independent routes. Atkinson trained herself in botanical, zoological and geological sciences and, from 1861-73, published a series of sketches in the *Sydney Morning Herald* on natural history, "A Voice from the Country". In addition to her role as scientific publicist, she identified new localities of plant species, sketched ferns, plants and native animals, and built a botanical collection of her own. In Tasmania, Louisa Anne Meredith, produced a series of published observations on Colonial life and the native fauna and flora, including her *Tasmanian Friends and Foes. Feathered, Furred and Finned* (1869), and *Some of my bush friends in Tasmania, native flowers, berries and insects drawn from life* (1860) illustrated with line drawings and colour prints, both of which works had wide popular appeal. Meredith painted the delicate, highly scented wildflowers of

Tasmania, collecting most of the specimens of plants and flowers (as well as insects and fish) herself, with rarer specimens supplied by the Tasmanian botanist Dr Joseph Milligan, and her drawings and descriptions gathered praise, and medals, as "excellent source material" and "faithful representations".[8]

The floral painter, Ellis Rowan, was also scientifically motivated in her ranging and botanically distinguished work culled on her adventurous forays into far North Queensland. She too relied on Mueller for the scientifically precise descriptions of the plants she drew, and proved a travelling emissary of daring spirit for Victoria's Government Botanist providing him with rare and striking specimens from distant parts. "My love for the *flora* of Australia, at once so unique and so fascinating", she wrote in 1898, "has carried me into other Colonies ... and some of the remotest parts of the great Continent of Australia. The excitement of seeking and the delight of finding rare or even unknown specimens abundantly compensated me for all difficulties, fatigue and hardship".[9] Exhibiting in Australia and overseas, Rowan won renown as an artist in her lifetime.

Yet more dense and widespread than these more pre-eminent players, was the contingent of Colonial women who delineated and recreated Australia's botanical world in their private sketchbooks; exhibited their watercolours and paintings in the Mechanics Institutes, Schools of Art, and at times in Colonial, Intercolonial and International Exhibitions; won medals at these 'showcases of science'; and were eager and informed participants of the cultural scene. One such representative was Annie Frances Walker whose remarkable 'Australian Florilegium', an eight volume collection of watercolours of the flora of Tasmania and New South Wales, was exhibited in part in London in 1883. Walker, in her diary, pinpointed the botanically educative role that generations of Colonial women played. Her grandmother, she wrote "used to encourage an interest in nature in her children and grandchildren by taking them on walks in the bush. The girls would collect (and later draw and preserve) flowers and plants whilst the boys shot birds and stuffed them."[10]

History, however, has obliterated these women's cultural part. They gave no papers, made no noteworthy taxonomic contributions, and hence have been excluded from the record of the male-valued scientific development. The story is not peculiar to Australia. "Women", Canadian scholar, Ann Skteir, sums up, "were all over the map of nineteenth-century botanical culture as cultivators of science".[11] Fortunately for gender scholars, the National Library of Australia and the State Libraries have preserved a diverse collection of these women's works.

Several of the nineteenth century women were serious and productive contributors. Harriet and Helena Scott, daughters of entomologist Alexander Scott of Ash Island, New South Wales, were key natural

history illustrators who, for three decades through the 1860-90's, executed almost all the art work for the scientific literature produced in Sydney including Gerard Krefft's *Mammals of Australia*, his *Snakes of Australia*, J.C. Cox's *Australian Land Shells*, Dr Wood's *Plants of the Darling* and their father's brilliantly illuminated *Australian Lepidoptera and Their Transformations*. In these works, their illustrative skills were scientifically precise and alternatively delicate and powerful. In Queensland another consummate, though less well-known, natural history illustrator, Rowena Birkett, hand painted the original 126 plates of birds, all life size, for her naturalist uncle, Silvester Diggles's *The Ornithology of Australia* published in 21 parts in Brisbane from 1866-1870 and was chief artist for 500 more prepared for Diggles ambitious but finally unpublished Synopsis of the Birds of Australia.[12]

Yet despite these major contributions to scientific explication, women's work was camouflaged. Membership of a scientific family often confirmed the subordination of the female role and absence of contemporary recognition. Birkett offers a salient case in point. Despite the integral relationship between nineteenth century science and art, her uncle made no mention in *The Ornithology of Australia* of her outstanding work while giving generous acknowledgment to assorted male collectors and colleagues. In similar spirit, Fanny Macleay, daughter of the most eminent and influential scientific family in New South Wales, proved a pivotal assistant in helping her father, the Colonial Secretary Alexander Macleay, build the most outstanding natural history and entomological collections in Britain and the Colony. Recording, collecting, cataloguing, drawing, preparing, exchanging, and conducting an informed correspondence with England's foremost botanist, Robert Brown and her naturalist brother W.S. Macleay, she remained, peripherally, an 'amanuensis', discouraged by both father and brother from developing her individual creative natural history flair.[13] "Scratch a male botanist [or naturalist] in the ... nineteenth century", Sktier observes tartly, "and one can expect to find botanical [natural history] relatives".[14]

Only the Scott sisters managed to stake out a partial recognition in this male-oriented world. Poorly paid for their illustrative work, they were, in time, allowed in as 'honorary' members of the masculine Entomological Society of Sydney of which their father was one-time President, and received, in some scientific publications, attribution for their artistic work. Yet resurrected only in the 1980's by women researchers, they and their remarkable scientific contribution remained invisible in the overarching framework of nineteenth century Australian science.

It was in the field of collecting, and there randomly, that Colonial women could win a small touch of recognition for their diligent contribution to science. I have fixed this survey's starting date to honour that most pioneering of the early women collectors, Georgiana Molloy,

who, arriving with her husband at Augusta, Western Australia in 1830, began the careful collection, preservation and packaging of native flora and seeds and their consignment to leading botanists and horticulturalists in Britain. Her seeds bloomed in showplace English gardens and her precise, carefully ordered plant specimens were an important source of botanical information to taxonomists at Kew. She won, however, no acknowledgment from learned British botanists for her long and valuable assistance in their published works. When she died in childbirth in 1843, having acquired what was for the time an encyclopaedic knowledge of the flowers of south west Western Australia, it fell to the rough West Australian botanist James Drummond, to attach her name to the tall scented boronia *Boronia Molloyae* in commemoration of her dedicated service.[15]

From the 1850's, however, a formidable regiment of women collectors (now coming to light) were scattered across the Colonies engaged in gathering, drying, describing and despatching their findings to Victoria's Government botanist, Ferdinand von Mueller and the algaeist, W.H. Harvey. Their names and collecting points litter the specimens found in Australia's Herbaria.[16] Mueller's collecting harem contained both the well-known and obscure of the era. To the diligent Euphemia Henderson, be proffered, and withdrew, his hand in marriage; but to others he offered a more subtle reward. Writing to Mary Bate of Tilba to tell her that her work had enabled him to complete a new series he had named for her, he wooed: "I hope this scientific acknowledgment will encourage you to continue your researches, as ... a whole host of rare plants and ... new ones remain there yet to be discovered".[17]

Was science different? Or was the fate of these women merely another piece of the social evidence recognised for women artists by Germaine Greer's *The Obstacle Race* and common also for women composers in the Colonies? Were nineteenth century women alert to their social differentiation and subordination in science? Or did Georgiana Molloy, offering her knowledge and collections to male experts as "a token of her interest and delight"[18] speak for the wide spectrum of Colonial women honoured to be allowed to serve the patriarchy of science? There was an enormous body of masculine opinion, as Virginia Woolf reflected a century later, "to the effect that nothing can be expected intellectually of a woman"[19] And perhaps, as one American writer has suggested, scientific men were encouraged to make women's exclusion more thorough through the very insecurity of science as ethos and career.[20]

Two women alone in nineteenth century Australia managed to surmount the extruding trend, and both experiences are suggestive. One was the German collector, Amalie Dietrich, "the fearless Frau". Despatched by the Godeffroy Museum of Hamburg, working alone in Queensland from 1863-71, collecting marine and land fauna, butterflies, wood, Aboriginal relics, insects, and flowers, no one circumscribed her zeal and she made what has been described as "the most important

collection made by any single person'' of that century.[21] Her secret? Her outsider status. She was an alien, ambitious and independent, and as such unrelated to, and free from, the social mores of the time.

The second exemplar was Lady Jane Franklin, traditionally recognised as the intellectual helpmate of Governor Sir John Franklin in Tasmania, but in reality a skilled science policy initiator. Reclaimed by recent feminine research, she emerges as both the prime moving founder in the early 1840's of the influential Tasmanian Society of Natural Science and the private founder of its journal, Australia's first serious scientific journal, the *Tasmanian Journal of Natural Science*.[22] Drawing in contributors, subscribers and an informed Colonial and overseas audience, Lady Franklin served as Australia's first innovative 'patroness' of science. Alert, however, to the political environment of the Colony, she imposed a strategic self-concealment behind the public figure of her scientific husband. Even so she exhibited the clear hallmarks of the European woman scientific patron. As Outram points out, women patrons ''provided the social setting in which future protégés could collect within the ambit of their patron... and woman, just as much as the male patron, proved by conscious exertion of social art and psycholol gical insight, a medium through which the aspiring young savant could locate his authentic self.''[23] Significantly, it was under Jane Franklin's concerted stimulus that distant Hobart became in the 1840's the locus of a cohesive Australian scientific activity.

Large research questions remain about women's participation in nineteenth century science. Yet one point is clear. Women's hidden contribution comes into sharper focus once investigators extend their ideas of scientific work beyond expeditions, taxonomy and theory, and include the gender and cultural factors that underpin the life of science.

SCIENCE IN THE UNIVERSITIES

In the last two decades of the century, education for women underwent change. New opportunities were unfolding. Women had first to wrest the right to matriculate; but, from the 1880's universities opened their doors to women and Edith Dornwell of the University of Adelaide became Australia's first woman B.Sc. in 1885, followed at Sydney University in 1888 and at Melbourne University in 1893. Women faced difficulties in science. Few were prepared in the nineteenth century girls schools in physics or chemistry. Most went into Arts, but at Sydney a compulsory science component in the Arts degree, plus a charismatic teacher, could shape a trend. There, the Professor of Geology, Edgeworth David, drew large numbers of female students, 70 between 1893-1914 as undergraduates in the Arts degree, and 23 majoring in geology as Bachelors of Science. ''Searching for fossils and rock by day and singing topical songs round the campfire by night'' as one recalled [24] was clearly an emancipating route and, through the role of a male mentor, geology became a field in which Australian women would excel.

What career options did these early science graduates have? Secondary teaching loomed large. Many flowed to the major girls high schools, and some boys schools in each State where some gave a stimulus to careers in science. The quality of the early women graduate teachers was high. Charles Birch, Emeritus Professor of Biology at Sydney University recalled the impact of a woman biology school teacher at Scotch College, Melbourne, who spurred him to his biological career.[25] In academia, institutional paternalism flourished. The male establishment might allow women into classes; but concepts of female stereotypes and of 'appropriate behaviour' denied them participation in the teaching process. Sydney University's third woman science graduate, Marion White, was recommended by Professor Haswell to the Senate for appointment as a Junior Demonstrator in Biology in 1897. The Senate declined, and she became the first recorded case of rejection for a post on the grounds that "she was a woman, and too pretty".[26] Slowly in the first decade of the new century some feminine appointments were made. Two won through with honorary Demonstratorships in Anatomy, unpaid, and from 1908, Junior Demonstratorships became the entry route for women to academic work. They appeared in Sydney in Geology and, by 1916 women were being appointed, after lower apprenticeships, to Senior Demonstratorships in Geology, Zoology, and Organic Chemistry. In Melbourne, Dr Georgiana Sweet (B.Sc. 1896; D.Sc. 1904) in fact became a lecturer in biology and parasitology at Melbourne University in 1908; was considered Australia's leading parasitologist; and became an acting professor in Professor Baldwin Spencer's absence from the Department in 1919.[27] A towering exception as the first woman associate professor in the early twenties, Sweet's career fell victim to stress and she dropped out early from the senior post.

Set against the tight cultural confinement of the previous century, tertiary education gave early twentieth century Australian women significant movement in science. A corps of highly qualified scientific women emerged across the period 1910-1939. Two phenomena marked their rise:

i) a strong motivation and confidence, and opportunities that led (conspicuously in Sydney) to careers in research; and
ii) a niche position captured by women, notably in Melbourne, in the young discipline of microbiology.[28]

Fundamentally, university education generated a strong thrust on the part of women towards the disciplines of botany, biology, geology, palaeontology and palynology. Women's science was organic. This had strong roots in the feminine botanical inheritance and found a widening professional participation for trained women as systematic botanists, biologists, biochemists, plant pathologists, agronomists, ecologists, agricultural scientists, conservationists, mycologists, bryologists, herbarium assistants and illustrators, and museum curators.[29]

Considerably rarer were the entrants to the hard sciences of physics and physical chemistry. Significantly also, women tended to find themselves more at home in the environment of government occupations.

At Sydney University, however, some research opportunities came early to a set of women through the introduction of Science Research Scholarships in 1912. By 1916, bright female candidates began to capture these scholarships in zoology, geology and organic chemistry. The geological women's profile was high. Ida Brown(e) and Germaine Joplin were among a cluster of women who secured the Macleay Fellowship of the Linnean Society of New South Wales and took out early Doctorates of Science,[30] while another stream of women became curators in the Faculty's Geology Museum. From other States, Dorothy Hill, geologist and palaeontologist lecturer and researcher at Queensland University, Irene Crespin at the Commonwealth Geological Survey, Isabel Cookson at Melbourne University, added to a distinguished roll. Between 1920-40, a surprising number of women scientists at Sydney pushed themselves through postgraduate degrees; 16 took M.Sc. and three the D.Sc. Still others won the prestigious British 1851 Science Research Award first granted to Australians in 1891 which took one scholar each year for research experience and PhDs to Oxford and Cambridge. Marie Bentivoglio, a graduate of Sydney in crystallography, was the first to capture this award for a woman in 1922 and five women, one from the University of Western Australia and four from Sydney University including Rita Harradence (later Lady Florey), in organic chemistry followed until 1940.[31]

The cluster of highly qualified science women from Sydney took a leadership role. Long excluded from the societies of science, a group of these M.Scs and Doctorates hammered at the door of the male Linnean Society of New South Wales in 1934 demanding, and winning, full membership rights. Significantly, all but one of the 1851 female prize winners (predominantly single women of post-World War 1) pursued research and modest level academic careers.

At the newly formed CSIR (Council for Scientific and Industrial Research), three women from diverse backgrounds became the first agricultural statisticians in the early 1930's: Helen Newton Turner in the McMaster Laboratory, Betty Allen at Plant Industry, and Mildred Barnard at Forest Products. All three took self-funded leave to attend the Galton Laboratory at London University to study under the father of agricultural statistics, Roland Fisher, and all, though pre-eminently Helen Newton Turner with her work in sheep genetics and improved fleece, brought innovative developments to Australia.[32]

While Sydney offers one positive scene, Melbourne emerges as an arena of feminine prominence in microbiology. By the later 20's and early 30's, a number of talented women were in place as bacteriologists in major hospitals of the States where several joined original research

to their clinical bacterial work. Hilda Gardener, Howard Florey's sister, an Adelaide graduate, was one such, placed in charge of the clinical pathology laboratory of Royal Melbourne Hospital in 1934. Others, drawn from Adelaide and Melbourne Universities, cut their research teeth as Research Assistants at Melbourne's Baker Institute and the Walter and Eliza Hall Institute of Medical Research where, under Macfarlane Burnet, they participated in his far-reaching viral and immunological research.

Their names — Phyllis Rountree, Jean Tolhurst, Nancy Hayward, Dora Lush — have resonance. They would move after further qualifications — the Diploma of Bacteriology, self-secured in London — to senior positions in the teaching hospitals where they made distinguished contributions to research on blood culture, infectious diseases, phage typing, and vaccines. The brilliant Dora Lush was a casualty. Described as "a major contributor to Burnet's work on bacteriophages and animal viruses, and coauthor of many of his most important papers over the period 1934-39",[33] she accidentally pricked her finger inoculating a virulent serum into mice in 1943, and died within a week from a severe attack of scrub fever.

Working in an environment of frontier research, these women felt neither exploited nor devalued. Helen Newton Turner stressed that she had no sense of being discrimated against and was happy to be included in a team. [34] But most women in science remained at the low end of the employment scale and evidence is scant that eminent male leaders like Burnet had a developed sense of the talented woman research assistant's claim to an independent career in science.[35]

Across the spectrum, research assistantships and demonstratorships gave important life to science. Men scientists frequently absorbed unacknowledged their assistant's work. Women lecturers went unelevated over many years. Senior lectureships were the exceptional woman's glass ceiling. As Margaret Rossiter stresses in her American study, *Women Scientists in America. Struggles and Strategies to 1940,* "university faculties were far more ready to educate women in science than to employ them, and were most adamantly opposed to advancing or promoting any but the most extraordinary".[36] In Australia, Lane records the case of the highly productive biologist and botanist, Winifred Curtis, at the University of Tasmania who, appointed to a lectureship in biology in 1939, had her salary reduced nine years later when the University Council ruled that the salaries of female staff be cut by 10 per cent.[37] Science was a patriarchy. It was also a brotherhood where male gatekeepers preferred to keep avenues of advancement closed to the handmaidens.

Nonetheless, what marks the period to the 1940's was women's sense of freedom and progress in science — a sense that, even while they remained in the entry hall, they had passed through a half-opened door. Here cultural attitudes played a shaping part. It was no coincidence that

in the thirties, the *Australian Womens' Weekly* presented adventure as its motif and the aviatrix as a role model. And the Second World War would for a period, give qualified scientific women a useful place.[38]

But a serious counter culture lay ahead. The postwar would initiate major attitudinal change. With soldiers returning and training for the professions, women's role was defined as home-centred. Now the *Women's Weekly*'s message was "you can enrich your life and exert your influence behind your man". Women went into universities and into science; but marriage was the feminine goal. Career motivations shrank. "Opportunity structure", as one sociologist indicates, "is an important variable in creating motivation".[39] For some two decades until the prosperous 1970's and the graduate advent of the baby boomers, it was deemed exceptional, even irrelevant, for a women to pursue a scientific career and poor science instruction available to girls particularly in private schools mirrored this social view. In addition, until 1970, science women in public service institutions, government departments and agencies (CSIRO, the BMR, AAEC) were extruded at marriage, while for university women, it appears from their informal evidence, that it was considered 'freakish' to continue a married life in science. Such women faced serious psychological challenges. As Rossiter sums up: "caught between two almost mutually exclusive stereotypes: as scientists, they were atypical women: as women they were unusual scientists".[40]

This cultural lag for women in science had deep and lasting affects. When, in 1953, the Australian Academy of Science was founded, no woman was elected to its Fellowship and, from 1956-69, only one woman, the Queensland research geologist, Dorothy Hill, was judged qualified for acceptance by the scientific elite. Beyond her, Australia's male science leadership judged that no women had managed to rise high enough in the research hierarchy to fill the Academy's election bill. It was thirteen years before Hill was joined by Victorian physiologist Molly Holman and the resident British mathematician, Hanna Neumann. In its resonant motto, "We are whom we elect", the Academy of Science clearly signalled its Fellows' own role as gatekeepers and their contribution to the long insidious process of discouragement of women in science.[41] Twenty years later, by 1993, in an Academy of over 300 (and a total of nearly 400 since its inception), five more women (all baby boomers) have been added to the Fellowship.

CONCLUSION

From this exploratory overview, several conclusions relevant to our contemporary situation emerge:

i) From their earliest participation, women contributors to scientific knowledge and information in Australia have been marginalised and rendered largely invisible in the record of science.

ii) Across the nineteenth century, scientific 'amateurs and gentlemen' accepted women in the cultural background, used their services and

data, and, even before professionalization grew, edged them from the mainstream of science.

iii) Professionalization and the growing societies of science further consigned women contributors to a second class, 'honorary' status outside the paradigm of science.

iv) With rare exceptions, women lacked mentors. But where male mentors existed, they lent strong stimulus to women's successful participation in a field.

v) A climate of social encouragement was vital to women's motivation to careers in science. The spirited women of the 20's and 30's showed competence in their professions, excelled men at times as prize winners, and proceeded to modest careers. Their highest reach was often lecturer, and, for more advanced high flyers, there was evidence of isolation, dropping out, and strain. Evidence across disciplines suggests that some science professors heaped high teaching loads on women staff while furthering their own research careers. There were, however, few strategies collectively designed by women to advance their status and position in science.[42]

vi) The role of the female Research Assistant became, from the 1920's, a crucial component of scientific research. The trend, far from declining, has reached peak proportions today. Figures from the Walter and Eliza Hall Institute of Medical Research for 1989 showed that 88 per cent of the research assistants employed were women[43], while a 1992 survey found that some 58 per cent of predominantly female biological research assistants sampled in Brisbane spent more than 21 hours per week doing experimental work, compared with less than 10 per cent for 56 percent of senior scientists, a result taken by the authors to suggest that a large part of Australia's research work is performed by fixed-term contract female 'scientific assistants'.[44]

vii) Conclusively, a male domination of the norms, ethos and rewards of science, and a cultural acquiescence in its legitimacy, has been the central obstacle to women's progress and interest in science. With too little modification, and a concomitant lack of role confidence on the part of women, many of the historical inhibitors identified in this overview remain influential today.

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42. An attempt by a core of women of the NSW Division of the Australian Association of Scientific Workers in 1941 to investigate and improve the working conditions of women, upgrade their low payment, and provide arrangements to assist qualified women with young children, made little headway. Report of a Subcommittee on Status of Women Employed in Science, July 1941. National Library of Australia. Typescript.
43. S.M. Kirov, 'Women in medical research and academia: What future?', *Australian University Review*, 34, 1991, pp.38-43.
44. S.E. Ashmore, L.A. Harvey and C. Runciman, 'Scientific Assistants: Contributions and Gender Issues', *Search*, 23, 8, 1992, pp.239-41.