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Speculative Obstetric Models: Remaking Historical Anatomical Models to Visualise Epigenetic Agency

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ABSTRACT

Nascent epigenetic enquiry understands that environmental influences can affect gene expression, often leading to heritable health adversity. Consequently, there is much focus on maternal bodies and maternal life circumstances. Increasingly there is a particular interest regarding mothers enduring low socioeconomic status as a causal explanation towards transferable epigenetic traits. Mothers have been 'biomarked' and made the soft target for society's ills across time, and while epigenetic environments may somatically materialize, negative maternal self-perception also has agency with real, material consequences. Medical illustrations and anatomical models culturally frame and reproduce what we see and how we understand bodies. Using conceptual materials that are loaded with meaning, I visually rewrite historical obstetric representations to introduce epigenetic themes in my artwork. Through this my work delivers a new way of visualising and perceiving epigenetic environmental agency imprinting upon maternal-fetal bodies to incorporate aspects of maternal experience and to challenge institutional concepts regarding socioeconomic status.

Keywords: epigenetics, maternal socioeconomic status, obstetric models, material feminism, contemporary art

INTRODUCTION

Positioned in what is obstetrically termed the right occiput transverse (ROT) presentation, a full-term infant balances within a maternal pelvis in preparation for an uncomplicated, 'normal birth'[1]. The infant's arms and legs are crossed and eyes closed. The pelvis is embossed with botanical impressions, and life-cast *melaleuca quinquenervia*[2] branches with fruiting capsules grow from the left and posterior pelvic bone creating a leafy cavity in which the fetus settles. The infant's umbilical cord is draped across its body, disappearing into a cleft of leaves rising from the right pelvic crest. Both the fetus and embellished pelvis are cast in bronze and silver-plated. A 19th-century oak plinth creates a medical stand, as is commonly used for the display of pedagogical medical models and specimens across time. This obstetric model is titled *Silver Spoon* (**Figures 1** & **3**) and a stainless-steel plaque on the oak stand reads:

And through the mother's gifting,

biophilia breathes abundance and

privilege into the unborn child.

Clare Nicholson, 2017.

By employing culturally esteemed materials to represent the safest birthing position and 'nature' embedded into the maternal corporeality, *Silver Spoon* challenges epigenetic discourses that define maternal low socioeconomic

[1] "The World Health Organisation (WHO) (1997) defines 'normal birth' as spontaneous in onset, low risk at the start of labour and remaining so throughout labour and delivery, with the infant being born spontaneously in the vertex position between 37 – and 42- weeks gestation, and after birth mother and infant are in good condition" (Anderson, 2015: 66).
[2] *Melaleuca quinquenervia* is a wetland tree species indigenous to eastern Australia (Kaufman and Smouse, 2001: 487).

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Figure 1. Nicholson, C. (2017). Silver Spoon, (detail) [Sculpture]. Photo Credit: Jessica Maurer.

status as a 'biological trait' playing through the maternal body, which disadvantages offspring health. Instead, *Silver Spoon* highlights beneficial environmental influences that can impress upon the body, and embellish the lives of mothers and fetuses in ways that have not yet been empirically quantified in scientific terms, and suggest the epigenetic embodiment of environmental influences that invisibly privilege future generations.

UNDERSTANDING EPIGENETICS

Epigenetics is a comparatively new line of scientific enquiry intendend to explain how environmental influences have the ability to impress upon the body, causing the alteration of gene expression and function, without altering the sequencing of the DNA (Rothstein et al., 2009). The body and its external environment are revealed to be interdependent and permeable, rather than discrete entities. Epigenetic expressions may be permanent or

reversible, and influential 'environments' can encompass many facets of life, such as diet (Landecker, 2011, Bunning et al., 2016), metabolism (Zauri et al., 2015; Bouchard et al., 2010), psychological states (Lee and Avramopoulos, 2014; Mulligan et al., 2012), behaviour (Rothstein et al., 2009; Su, 2016), socioeconomic status (Landecker, 2016; Wells, 2010) and toxicant exposures (Szyf, 2007; Mansfield, 2012). Arguably, this range of molecular mechanisms, which perform as causal triggers, ensure that the complexity of epigenetic enquiry is multifaceted, stochastic and to a great extent, indefinable.

Epigeneticists are particularly interested in maternal-fetal programming; how detrimental environmental exposures by women can induce transgenerational epigenetic fetal changes leading to childhood and adult-onset disease (Kenny and Müller, 2017; Heijmans et al., 2009). Gluckman et al., (2008: 61) outline these plastic fetal changes as '(…) the ability of an organism to develop in various ways, depending on the particular environment or setting (…)', while Burgio (2015: 2) clarifies:

> This model of pathogenesis is the so-called theory of the embryo-foetal origins of adult diseases (DOHAD: Developmental Origins of Health and Diseases).

However, Lock (2018: 459) outlines how: '(…) the environment in this type of research is effectively scaled down to molecular activity inside a single organ of the body – the uterus and its foetal contents'. It is this focused 'scaling down' that has prompted my work as an artist in the visual remaking of obstetric models as a way of visually articulating the entanglement and fusion of internal epigenetic somatic worlds, and the invisible agency of external environments that are not valued and quantified, such as being born into unsullied, natural environments.

Hopefully, epigenetic findings will lead to a better understanding of the adverse health effects that can arise from compromised environmental conditions, which then can instigate supportive or therapeutic interventions, and also introduce policies for the betterment of societal health. However, at present it is important to recognise that the complexity of exterior influences which can become heritable maternal effects are accurately contextualised and carefully conveyed, as incorrect or simplistic epigenetic interpretations are already radiating across public domains, targeting mothers and their life circumstances in unhelpful and stigmatising ways. For example, see the self-help book titled *Epigenetics. The DNA of the Pregnant Mother: How to strength [sic] Your Genes and Create Super Babies Conceived Naturally or by Egg Donation* (Toledo, 2017), a blog post advising mothers on how to think, eat and behave entitled *Garbha Sanskar, Nurturing the unborn child in the womb* (Vadakayil, 2014, January 22); and an article in *Rediscover News* (2010) entitled *Heal your brain by reversing intergenerational trauma* which represents a photographic matrilineal line up across three generations as a way of demonstrating where "intergenerational trauma" originates from. The intention of my obstetric model *Silver Spoon* is to rewrite such time-weary socio-medical prejudicial attitudes that can marginalise and blame mothers for their life circumstances, by representing the values of motherhood and rich environmental influences.

Low maternal socioeconomic status is considered a serious epigenetic trigger for offspring adversity, including being causal in debilitating chronic diseases (McGuinnes et al., 2012, Deans et al., 2009), cognitive impairment (Hackman et al., 2010), mental illness (Cunliffe, 2016; Swartz et al., 2016; Bradley and Corwyn, 2002), obesity along with failure to thrive (King et al., 2015; Thornburg et al., 2010), behavioural problems (Duncan et al., 1994) and even adult criminality (Walsh and Yun, 2014). When the maternal body is generally understood to be a causal 'site' for reproducing class-differentiated disadvantage, the focus often shifts towards a moral viewpoint on the individual woman and her lifestyle 'choices', as opposed to larger societal problems that create socioeconomic biopolitical inequity. As Lock (2015: 152) warns:

> Although involved epigeneticists acknowledge in principle social, economic, and political variables that contribute to the unequal distribution of health and illness, many, but not all, essentially set these variables to one side in order to conduct, standardize, and regulate their laboratory work. Hence, the consolidation of a newly assembled neoreductionistic approach to the human body is in the making.

Such selective scientific approaches regarding acquired molecular biomechanisms that impress upon the body not only frame and direct bodies in particular ways, but also create societal attitudes towards those who inhabit such bodies; culturally, politically, racially, geographically, legally, economically, medically, socially, ethically and philosophically. Aligning the epigenetic loci of the maternal body with low socioeconomic status as a heritable deficit is a reminder of prejudicial attitudes in medicine that have found mothers to be at fault and to blame for offspring adversity, identified from antiquated medical treatises onward (Park and Daston,1981; Daniels,1997; Sommerfeld,1998; Frost, 2001; Jackson and Mannix, 2004; Rolfe, 2008). To be clear, while I am not suggesting epigenetic enquiry is the location of mother-blaming, I am concerned that, if we are not careful, the foci of epigenetic interpretation could become a new site for rehashing old mother-blaming attitudes, which then become adopted within society. As Landecker (2011:188) states, "The idea of male/female or generational responsibility for the future health of generations is simultaneously in tension with the very idea that individuals could

meaningfully control their environments in such a way as to intentionally direct future phenotype." So with this in mind, I remake historical obstetric models to '(…) situate bodies in time and space, thus bringing to the fore the inevitable coalescence of material bodies in environments, histories, social/political variables, and medical knowledge of all kinds' (Lock, 2017: 5). The structural elements and the materials I have used in *Silver Spoon* are an attempt to outline the complexities of epigenetic enquiry in order to dismantle simplistic readings of embodied health aligned to maternal socio-economic status.

RESHAPING EPIGENETIC LANDSCAPES THROUGH OBSTETRIC MEDICAL MODELS

Through my artmaking I subscribe to material feminist theory, by using materials that are loaded with cultural meanings so as to conceptualise and contextualise the entanglement of histories with environments in the anatomical representations of female bodies. In this way my medical models bring epigenetic agency to the fore, by incorporating the materiality of the lived maternal experience; the porosity and mutability of not simply the body being imprinted upon by environmental factors alone, but between '(…) the interaction of culture, history, discourse, technology, biology, and the environment (…)' (Alaimo and Hekman 2008: 7).

By remaking obstetric anatomical models that are embellished with 'nature objects', and by using materials that are considered to be loaded with cultural baggage, I want to suggest in my artwork the value of influential epigenetic environmental agency impressing upon and altering maternal bodies.

Renaissance medicine, and the anatomical models that ensued, are considered to herald the birth of Early Modern clinical empiricism (Wolfe 2010: 957-993), that is to say the scientific rational inquiry into the human body. Such 'rationality' was heavily contextualised by the cultural milieu of the day, positioning bodies to be viewed in certain ways (Rifkin et al., 2006). No amount of dissecting cadavers could reveal the physiological 'black box' of the living body, and consequently much speculation took place. However, the historical production and reproduction of anatomical knowledge developed a particular form of visual somatic legacy, which still exists today. Medical illustrations, anatomical models and 'phantom' protheses have become pedagogical substitutes for living bodies, which are designed to impart an objective, empirical, universal 'truth' regarding what are imagined to be stabilized and fixed bodies. Such practises of representation are perceived as tangible educational instruments, that effectively disengage subjective, emotional responses. These representations have become powerful cultural mediators directed towards what we 'know', how we 'see' and how we 'understand' bodies. However, epigenetic environmental influences are increasingly becoming understood as agents of biological change, that dismantle notions of the fixed, empirical body. By rethinking and visually remaking obstetric models I am interrogating corporeal meaning, in line with this epigenetic understanding. My work attempts to visually *materialize* epigenetic molecular reverberations that have biochemically imprinted maternal and fetal bodies, and in so doing, problematise simplistic understandings of maternal corporeality.

Throughout postmodernity, the semiotic practice of representing female bodies, let alone fragmented, flayed or dissected female bodies, was not only considered highly problematic, but also taboo within contemporary art. But as Haraway (1988: 580) argued:

> We need the power of modern critical theories of how meanings and bodies get made, not in order to deny meanings and bodies, but in order to build meanings and bodies that have a chance for life.

This argument is as pertinent now as it ever was. By creating a nuanced visual literacy from historical medical constructions drawn around the gestating body, and incorporating latest molecular findings, questions what does epigenetics deliver and subtract when it comes to mothers and motherhood? My aesthetic and material techniques are intended to act as '(bio)markers' for embodied lived experiences; to critique complex epigenetic perspectives, since epigenetic theories are at a tipping-point, with a potential to create a new discourse of mother-blaming attitudes.

AFTER WILLIAM SMELLIE: QUESTIONING WHAT HIGH SOCIOECONOMIC STATUS MIGHT LOOK LIKE

William Smellie's 1754 *Set of Anatomical Tables* was a treatise designed to illustrate as accurately as possible a realistic female pelvis and fetus (**Figure 2**). Longo & Reynolds (2016: 138) cite Smellie as stating:

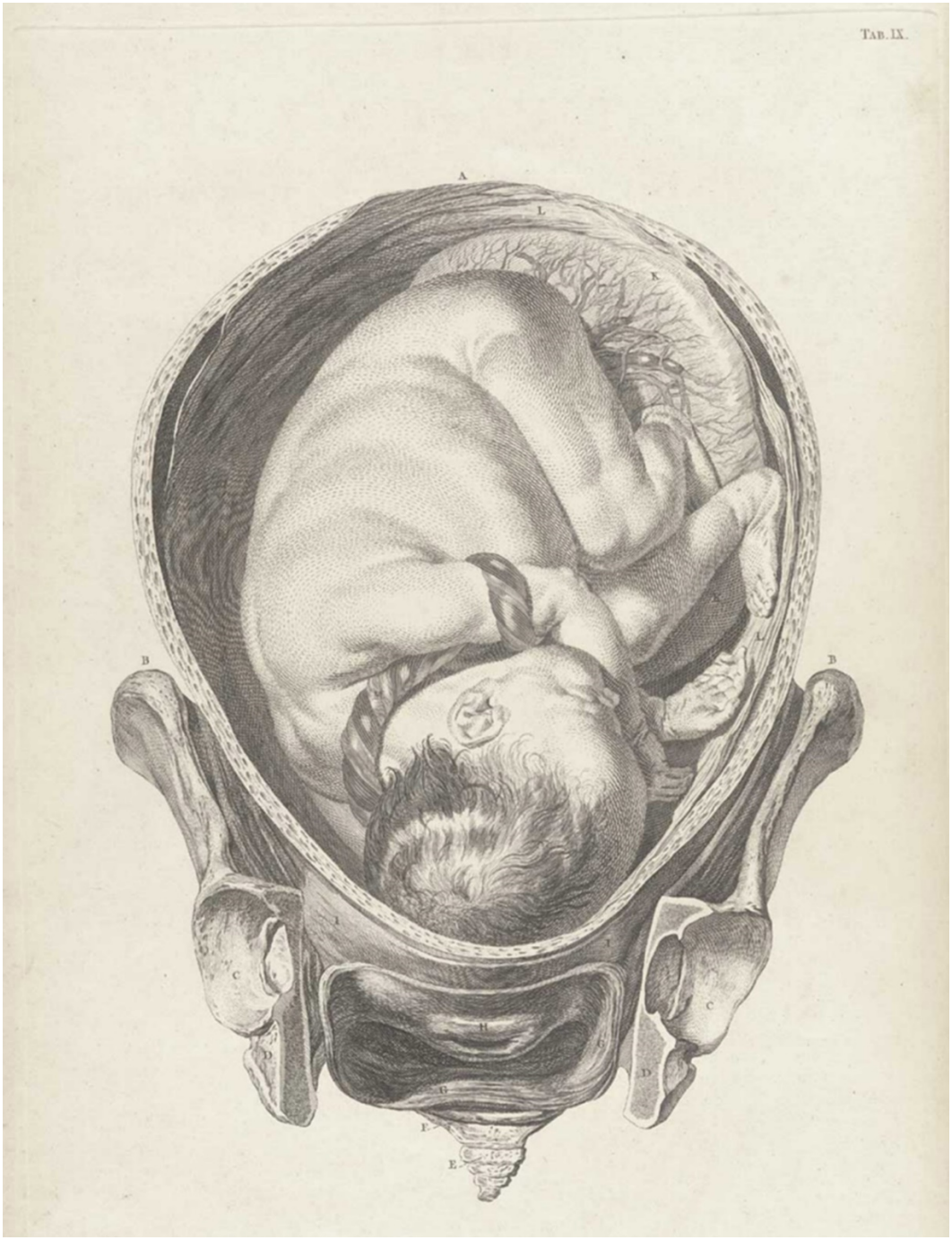

Figure 2. Smellie, W. (1774). Ninth Table [Etched plate]. Retrieved from University of New South Wales, Sydney, Australia. Available at https://www.nlm.nih.gov/exhibition/historicalanatomies/Images/1200_pixels/Smellie_09.jpg (Accessed 12 July 2017).

> '(…) I hope I may without vanity say, that I have done something towards reducing that Art, into a more simple and mechanical method that has hitherto been done'.

By 'reducing the art' Smellie was referring to the desire to eradicate artistic style in order to illustrate medical-scientific accuracy. Kemp (2010: 192) explains how artistic style in anatomical art spoke of the maker's mode of presentation, the production of this art, patronage, and the intended reception. 'Style' was not valued as a prime criterion within scientific models, although aesthetic style played a major part in historical anatomical art, as it still does today.

Figure 3. Nicholson, C. (2017). Silver Spoon [Sculpture]. Photo Credit: Jessica Maurer.

With this in mind, *Silver Spoon* (**Figure 3**) is stylized through aesthetics and the material form of bronze, silver-plate and antique oak. The use of bronze alloy has spanned many countries and cultures at different times. Glausiusz (2008: 3) discusses how the global trading of copper and tin – the ingredients for bronze, '(…) drove commerce between kingdoms of the second millennium BC and inspired a cross-border blossoming of art and technology'. Kleiner (2012: 493) explains the Chinese Shang dynasty (ca. 1600-1050 BCE) '(…) perfected the casting of elaborate bronze vessels… used in sacrifices to ancestors and in funerary ceremonies', and Bourla (2015)

writes about the Renaissance use of bronze écorché (flayed) statuettes for the accurate anatomical study of the muscles to be used in art and science. Historically and into contemporary times, bronze has been the ubiquitous, semi-precious metal of 'heroic male statutory', cast in order to memorialise the celebration of triumphant military and sporting battles (Beckstead, Twose, Levesque-Gottlieb and Rizzo, 2011; Inglis and Brazier, 2008; Holt, 2017; Osmond and Phillips, 2016). By utilising bronze for the model *Silver Spoon* I am acknowledging the enduring hierarchical cultural orthodoxies embedded within this metal.

Across time, silver has been established as a precious metal and employed for a variety of uses. Alexander (2009) explains that the medicinal history of metallic silver extends back to 4,000 BCE and folkloristically used to promote wound healing, as a blood purifier, and to treat heart palpitations. Silver was thought to reduce mortality rates during plague epidemics. However, Alexander also makes note that from the 1700's onwards '(…) privileged families used silver eating utensils and [they] often developed a bluish-gray discoloration of the skin, thus becoming known as "blue bloods" (2009: 290). This condition is called argyria, and can also cause tissue and organ damage[3].

Smith and Beentjes, (2010) state that from the 16th-century, silver life-castings of small reptiles or plants served as proof of rare or odd natural phenomena; such life-castings were used as stand-ins for perishable natural objects, but also to display the artistic knowledge and talent used in producing fine moulds and metal castings. However, these life-casts '(…) also possessed a more profound significance [of demonstrating] the human ability to imitate the transformative powers of nature" (2010: 140).

In 1825 'The English parliament passed the 'Sterling Silver Money Act' which legally made British coins the only recognised form of currency in Australia… Silver coins were shipped to Australia after being made at the British Royal Mint' (Royal Australian Mint website (n.d., para. 10). Counter to such governmental regimes, Pascoe[4] (2014: 137) explains that within Australian Indigenous cultures,

> 'one of the central tenets of trading was the sharing of resources (…) actively pursuing the opportunity to attract other clans into their country for the purpose of cultural and social exchange. The resource was more than a commodity; it was a civilising glue'.

The Eurocentric saying: 'To be born with a silver spoon in your mouth' means to have high social position and to be rich from birth (Cambridge Advance Learner's Dictionary and Thesaurus, n.d.), but clearly such sentiments are highly problematic. This particular precious metal not only created insidious disease in the wealthy elite, but in many ways remains symbolic of a colonising mercantilism that invaded, denied and dismantled Australian Aboriginal custodian law.

Chwalkowski (2016:169) explains that historically oak was '(…) the raw material for every kind of human fabrication (…) [becoming] (…) a symbol of affirmation, strength, dependability, and endurance in many cultures. Ancient Druids '(…) traditionally associated [oak] with cycles of birth and death (…). Chwalkowski cites Ernst and Lehner (1960) who claim the oak was also a '(…) symbol of fecundity and immortality' for Nordic tribes. England has named the oak tree as a national symbol, believing there are '(…) more ancient native oak trees [in England] than the rest of Europe combined' (Ough, 2017: para. 4) while, America has claimed the oak as the national tree for its '(…) striking symbol of our nation's great strength' (Rosenow, cited by Nix, 2018: para. 2).

Generally, antique objects are considered authentic material conduits to previous generations. Symbolically they speak of valuing bygone cultural eras, familial and historical narratives and exhibiting a long-lost craftsmanship attached to particular milieus. Antique objects are also often read as tropes for iconic memorial, and used to symbolize the poignant affects of memory and caring.

By selecting these materials for the obstetric model *Silver Spoon* I am evoking all of these cultural associations: bronze for uniting a 'cross-border blossoming of art and technology' (Glausiusz, 2008: para. 3) and the subsequent iconic orthodoxies wrapped up in bronze memorializing statutory. By employing bronze in *Silver Spoon* I dismantle the gendered idealization concerned with the celebration of male achievement, in order to honor the achievement of women and mothers. Silver is used for its instantly recognisable cachet, and the casting of silver melaleuca plants in order to demonstrate the historical '…human ability to imitate the transformative powers of nature' (Smith & Beentjes, 2010: 140), and also to represent the way nature powerfully affects human ability, indicating the somatic changes that result through environmental imprinting. While the use of silver conveys the archaic medicinal understanding of healing, these prophylactic properties are also insidiously capable of causing detrimental adversity within privileged communities of higher socioeconomic status [5]. Silver use is representative of Eurocentric

[3] "… Silver can accumulate in the skin, liver, kidneys, corneas, gingiva, mucous membranes, nails and spleen (Sue et al., 2001, as cited by Drake and Hazelwood, 2005).

[4] Pascoe '… has a "complex" racial background, which includes Bunurong (South central Victoria), Yuin (NSW south coast) and Tasmania Aboriginal, as well as ancestry from Cornwall in the UK' (Tan, 2016: para. 15).

[5] Arguments that assume 'higher economic status' equates to improved health are often flawed. Adams, (2012: paras. 1- 2) for example clarifies eating too much is now claiming three million lives a year in the West– which is three times the number of individuals who die of malnutrition in developing countries untainted by Western diets. 'Poverty' in this instance is the safety-net against premature morbidity.

currency and emblematic of the devastating effects of imperialism within Australia. So in these ways I suggest that this salubrious metal has the ability to problematise and contradict cultural beliefs that higher socioeconomic status acts as a 'cure-all' epigenetic remedy.

Oak's evocative symbolism is tied up with strength, fecundity, dependability, endurance and wisdom, alongside antiquity as a means of valuing intangible cultural heritage. The use of oak is rapidly becoming obsolete in everyday life, as it is lost to mechanised technologies of mass-production as demonstrated in today's factory-produced medical models. By animating these materials through traditional anatomical artmaking skills in *Silver Spoon* I wish to problematise dominant cultural values that are tied to socioeconomic status; and link wealth to the epigenetic safety-net deployed against heritable disease and adversity.

The *melaleuca quinquenervia* twigs were sourced from my local Sydney environment. The Australian Government Department of Agriculture and Water Resources (ABARES) (2017) outline 6.4 million hectares of native melaleuca forests that trap vegetation and debris deposited in coastal areas during floods, and provide habitat for fish and bird species, retain and filter water and reduce soil and sediment run-off. Kamenev (2011: para. 7) explains that the foliage from several melaleuca species contain medicinal essential oils, and the Bundjalung Aboriginal people from the east coast of New South Wales use a poultice of crushed leaves for wounds, and brew a tea for throat infections. Aboriginal Education Officer for the Sydney Royal Botanic Gardens, Clarence Slockee (2010: paras. 5 & 6) explains the Cadigal; ancestors of the Dharug and Eora[6] nations used melaleuca bark to create shelters and as bedding. Wet bark was used to wrap around fish, emu or kangaroo to prevent the flesh burning while cooking in the fire, and due to its softness, the bark was also used by mothers to make coolamons (bowls) for their infants[7]. But despite such a rich cultural heritage and the obvious environmental, social and medicinal benefits, many melaleuca forests have become listed as endangered within Australia due to agricultural pursuits[8].

Juxtaposing human anatomy specimens with European plants, especially tulips, was popularised by Vanitas from the Dutch Golden Age - a 17th century genre that was affiliated with still life paintings. Vanitas were loaded with Eurocentric social values and mores, intended to prompt the viewer's memory in order to connect through symbolism entrenched social and religious doctrines, such as *memento mori* (remember you must die) (Valverde, 2009: 508). By embodying the indigenous melaleuca plant over a cultivated European pant the artwork seeks to deny the Eurocentric valuing systems that "standardize and regulate" (Lock, 2015: 152) hierarchical epistemologies that fail to honour Indigenous-place, Indigenous knowledge and Indigenous spiritual connectedness to the land. In this way the artwork venerates instead the wealth of epigenetic agency and fecundity that resides in Indigenous cultural, spiritual and agricultural legacies (**Figure 4**). Such inclusion feels important given the forced invisibility of Australian Indigenous peoples by European colonisation and ongoing racism, which has persisted since white settlement (Anthony, 2016; Russell, 2005; Moses, 2005; Healey, 2011). Applying a thin white silver-plating wash over the life-cast melaleuca imparts a sense of colonisation; a veil to conceal that which is lost through Eurocentric sovereignty, because as Pascoe (2014: 158) states:

> To deny Aboriginal agricultural and spiritual achievement is the single greatest impediment to inter-cultural understanding and, perhaps, Australian moral and economic prosperity.

Consequently, *Silver Spoon* questions what exactly *is* high socioeconomic status, when colonial history has ensured invasive economic prerogatives have dismantled the wealth of Indigenous cultural legacies, limiting an ongoing ability to maintain an innate connection to the land.

[6] "It is generally acknowledged that the Eora are the coastal people of the Sydney area, with the Dharug (Darug) people occupying the inland area from Parramatta to the Blue Mountains" (Heiss and Gibson, n.d.).

[7] See Pearn (2005) for the ethnobotanical recording of Australian Aboriginal use of plants for child health.

[8] See the Australian Government Department of the Environment and Energy website (n. d) for clarification on which Melaleuca species are at risk.

Figure 4. Nicholson, C. (2017). Silver Spoon [Botanical life-casts]. Photo Credit: Jessica Maurer.

AFTER WILLIAM HUNTER: UNEARTHING BODIES OF KNOWLEDGE TO CONVEY PRIVILEGING FACTORS

> *Anatomical figures are made in two very different ways; one is the simple portrait, in which the object is represented exactly as it was seen; the other is a representation of the object under such circumstances as were not acutally seen, but conceived in the imagination.*
>
> William Hunter, 1774 (as cited by Longo & Reynolds, 2016)

In a further attempt to make epigenetic connections directly linked to the land, I use the primal material of earthenware clay to create an obstetric model "conceived in the imagination" (Hunter, 1774 as cited by Longo & Reynolds, 2016) and inspired by William Hunter's 1774 treatise *Anatomia uteri humani gravidi, Tab VI* (**Figure 5**). Jan van Rymsdyk was the artist responsible for the thirty-four life-size copper plates that made up Hunter's treatise[9] (Rifkin et al., 2006: 194). Van Rymsdyk was clearly an extraordinarily fine draftsman, capable of conveying the connection between delicate artistic stroke and visual impact. However, it is interesting that van Rymsdyk applied such visual sensitivity to the unborn child, but that such sensitivity is entirely lacking in the representation of the maternal body. The infant is intact whereas the mother's fragmented body resembles a butchered mass of meaty

[9] The drawings for this book were started in 1751, however publication did not take place until 1774 (Rifkin et al., 2006: 194).

Figure 5. Hunter, W. Artist van Riemsdyk, J. (1774). Tab VI. [Etching]. Courtesy of the National Library of Medicine. Available at: https://www.nlm.nih.gov/exhibition/historicalanatomies/Images/1200_pixels/Hunterw_table_06.jpg (Accessed 26 July 2017).

off-cuts, laid bare in a confronting manner. This juxtaposition causes a friction that both lulls and repels, imparting a sense of lurid medical-scientific scrutiny of the gestating maternal body, in order to reveal the untouched and perfect fetus growing within and reminds me of Richardson's (2015: 223) observation concerning epigenetic maternal-fetal programming:

> The maternal body is a transducing and amplifying medium necessary to get to the fetus, an obligatory passage point, not a primary endpoint or subject of DOHaD research.

As previously discussed, the fetus in *Silver Spoon* was inspired by the illustrations of anatomist and man-midwife William Smellie, who cared for disadvantaged and poor women (Roberts et al., 2010: 205-206). In contrast, Massey (2005: 77) explains:

Figure 6. Nicholson, C. (2017). Fertile garden [Sculpture]. Photo credit: Jessica Maurer.

> 'Hunter was the antithesis of Smellie (…) becoming a fashionable man-midwife to London's elite (…) with his career culminating as Physician Extraordinary to Queen Charlotte, wife of George III'.

With this understanding I closely reworked Hunter's anatomical plate using only earthenware clay in order to dismantle the cultural hierarchies associated with bronze, silver and antique oak. Historically, glazed ceramics signified high-brow culture and were employed in Vanitas to demonstrate luxury and wealth. So, by utilising unglazed clay, the obstetric model *Fertile Garden* (**Figure 6**) is the un-gilded lily, reliant only on an embellishment of structural form and the alchemy of heat to turn mud into 'rock'. I chose Keane's White 37 earthenware – a clay body that is formulated using a combined mixture of raw clay materials from Australia, the USA and Canada, and talc from China, with a small proportion of bentonite added to enhance the clay's natural plasticity[10] to make the work. This melding of natural, raw geological elements taken from disparate global environments and altered to enhance plasticity in order to enable reshaping and remodelling spoke to me of the agential epigenetics which entangle maternal and fetal bodies directly with the land.

Just like Hunter's dissected and fragmented *gravid uterus*, the abdomen and uterus in the model *Fertile Garden* are also dissected, but its anatomical elements are substituted with botanical components in order to demonstrate the interlocking entanglements which permeate through the mother's body to imprint upon the unborn child. The fetus is well-nourished, also presenting in the right occiput transverse position, but with its head engaged as a sign of imminent birth. Despite this impending event, the infant appears relaxed, resting, with knees gently bent, an arm outstretched, and hands semi-closed.

[10] (Keane's Ceramics (personal communication), October 30, 2018)

Figure 7. Nicholson, C. (2017). Fertile Garden (Detail) [Sculpture]. Photo credit: Jessica Maurer.

A midline surgical spinal incision creates a 'window' into the infant's interior body, exposing a hidden fledgling garden growing within (**Figure 7**), passed on from mother to child. These adornments signify privilege and hierarchical wealth, which is delivered symbolically through the embodiment of agential botanical materiality, permeating through the mother's body to imprint upon the unborn child. Despite such clinical intervention, *Fertile Garden* does not express the same level of butchery as Hunter's illustration. Anatomical details within the cross-sectional view of the amputated legs and the maternal genitalia are minimised or omitted to direct the gaze towards aspects of the maternal anatomy that are enhanced by alluring vegetation. For example, adipose tissue is renewed by blossoming clumps of *Crocosmia croscosmiflora*, which can be seen in the details of **Figure 7**. These plants create a lattice criss-crossing pattern – an ordered 'tangle' of growth, interwoven and spilling out from the anatomised

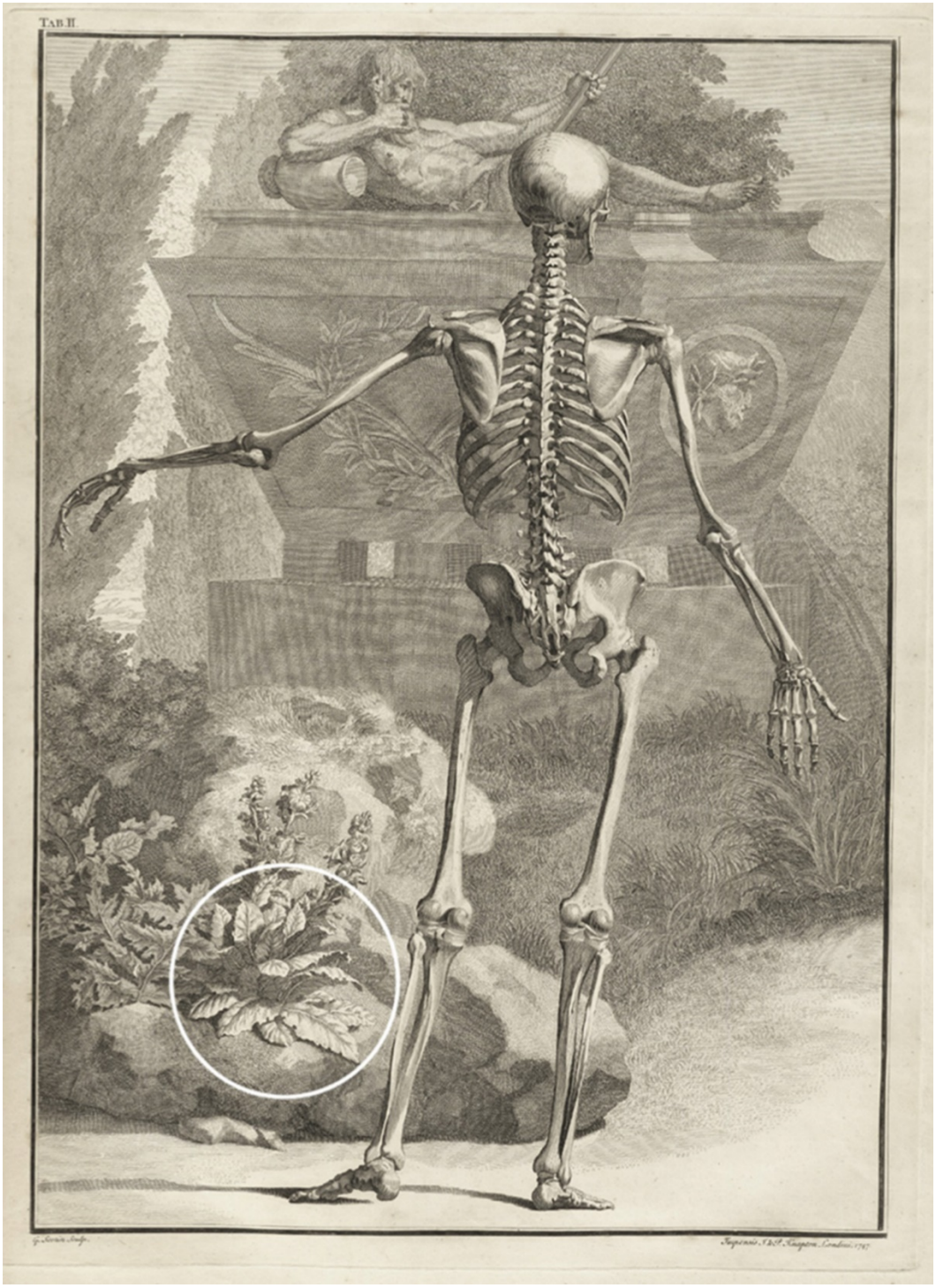

Figure 8. Albinus, B. S. Anatomical artist Wandelaar, J. (1749). Tabulae sceleti et musculorum corporis humani [Etching]. Courtesy of the National Library of Medicine. Available at: https://www.nlm.nih.gov/exhibition/historicalanatomies/Images/1200_pixels/Albinus_t02.jpg (Accessed 30 October 2018).

abdominal flaps. "Crocosmia, commonly known as Montbretia, is a member of the Iridaceae [Iris] family from South Africa" (Hankins, 2009: 2). Within folklore traditions, the iris symbolizes 'faith, wisdom, valor, hope, light and promise' (Lehner and Lehner, 1960: 118). The maternal torso height has been extended to incorporate the liver (an organ predominately known for its blood purifying qualities), which has been replaced by a wreath of *Acanthus mollis* instead.

Acanthus mollis was '(…) common in gardens during Roman times' (Stackelberg, 2009 as cited by Yilmaz, et al., 2013: 140) and '(…) considered to symbolize life, immortality, the horns of lunar crescent, and the veneration of the arts' (Cooper, 1987, as cited by Yilmaz, et al., 2013: 140). *Acanthus* also featured in historical anatomical plates, as seen in Bernard Siegfried Albinus' 1749 treaties *Tabulae sceleti et musculorum corporis humani* (**Figure 8**). Within

Fertile Garden, *Acanthus mollis* also replaces the placenta, which in turn elongates to become an umbilical 'vine', connecting mother and infant.

By combining these botanical elements within the maternal anatomy and fetal *hortus conclusus*[11] I wish to suggest all of the meanings associated with the plants stated above, whilst also referencing historical socio-anatomical connections that indicate how the dissected body has previously been aligned with nature. However, I also want to infer the reciprocal epigenetic symbiosis between the ecological transgenerational imprinting of maternal and fetal bodies, which dismantles the historical externalizing parameters that separate nature from nurture. Utilising the fragility of humble earthenware clay implies the endangerment and need for a primal environmental human connection between such untainted, unmechanised and 'natural' landscapes. Materially uncomplicated, the fired mud which constructs *Fertile Garden* is intended to counter biological threats derived from the contemporary Anthropocenic burden of contaminated, toxic landscapes in order to represent 'wealth' in its purist form.

Kahn (1997: 2) discusses Wilson's (1984) belief that '(…) biophilic[12] instinct emerges, often unconsciously, in our cognition, emotions, art, and ethics …' Kahn proposes this hypothesis provides a '(…) framework by which new scientific ground across many disciplines can be charted that bear on understanding the human relationship with nature'. However, the exploitative and destructive treatment of natural environments and biodiversity (Yap et al., 2015; Koh et al., 2004), worsening ecotoxicology (Singh and Prasad, 2015; Griffin et al., 2002) along with encroaching urbanisation, leave many young people feeling a sense of disconnection with nature (Fairweather, 2014; Miller, 2005). Kellert (1996: 32) wrote:

> People can survive the extirpation of many life forms, just as they may endure polluted water, fouled air, and contaminated soils. But will this impoverished condition permit people to prosper physically, emotionally, intellectually, and spiritually?

Over two decades later, the importance and urgency of this question continues to gather momentum, although muffled by conventional notions of what prosperity and capital are supposed to look like.

Wells (2010: 11) is concerned about epigenetic fetal adversity resulting from maternal low socioeconomic status, writing that:

> While the ghetto in its traditional sense reflects a form of social isolation, I want to extend this concept to a physical bodily dimension and use it to express the impact of economic marginalization on the physiology of reproduction. If pregnancy is a niche occupied by the fetus (Wells, 2007), then economic marginalization over generations can transform that niche into a physiological ghetto where the phenotypic consequences are long-term and liable to reproduction in future generations.

Wells (2010) has maternal and offspring wellbeing at the forefront of his mind, but his use of disparaging terminology to describe maternal bodies could easily be misunderstood, distorting societal attitudes towards maternal responsibilities. Singh (2012: 311) alerts us to a 'landmark warning' issued in 2011 by the American Academy of Paediatrics (AAP) that:

> '(…) certain demographic factors [such as] poverty, lack of community resources, lack of education, abuse and neglect (…) create stresses that are literally written into the biological processes of development (…)'.

The AAP have coined the term "toxic stress" (AAP, 2012, "Toxic Stress on Children: Evidence of consequences": para.1) for this 'aetiology', outlining that these traits start in the womb.

Attaching such labels to a gestating mother's life circumstances could surely have devastating outcomes as mothers refuse to seek healthcare support for fear of prejudicial labelling and stereotyping. As Alaimo and Hekman (2008: 7) point out, '(…) discourses have material consequences that require ethical responses'. Marginalised mothers enduring low socioeconomic status have been made very aware of their denigrated cultural and social placement (Flanagan, 1998; Kaplan, 1992; Keefe et al., 2017; Read, 2000; Rolfe, 2008). Bhatia et al., (2015: 9427) studied the combined effects of maternal perception of neighbourhood quality with preterm birth outcomes:

[11] *Hortus conclusus* is an enclosed garden, a '… potent sign within which art, religion, medicine, and social constructions of gender coalesce to produce meaning' (Corazzo, 1996: 132).

[12] Edward O. Wilson's 1984 book *Biophilia* provided an '…understanding of how the human tendency to relate with life and natural process might be the expression of a biological need, one that is integral to the human species' developmental process and essential in physical and mental growth' (Kellert, 1993:20).

> The risk of preterm birth among mothers who perceived their neighbourhood as of poor quality was about 30% greater compared to mothers who perceived their neighbourhood as of good quality; the risk was 12% greater among mothers with low resilience compared to those with high resilience.

This study strongly suggests that the human psychological response created by disadvantage and stigmatization epigenetically 'materializes' into somatic and physiological adversity, puting both vulnerable mothers and infants at risk. The use of clinical discourses which subjugate and abject maternity continues: a cursory look at birthing models for sale on the digital shopping forum ebay reveals this point. Crudely fabricated from cheap, stiff, plastic of a generic monochromatic Caucasian skin tone, one model consists of the severed lower torso of a gravid female body, with splayed amputated thighs positioned upwards and outwards, exposing a gaping keyhole as a 'stand-in' for the vagina, and surrounding genitalia. Plastic screws hold a gravid abdomen 'plate' in situ, and the leg stumps to the pelvis. With an expression of distress, an underweight, but otherwise 'intact' plastic neonate lays next to the fragmented maternal abdomen in a curled up semi-fetal position. Metal screws secure the arm and leg joints and a pliable yellow 'umbilical cord' connects the infant to a dark red, round plastic disc with embossed 'veins' to represent the placenta. This inadequate model does not speak of maternal lives, experiences or the passing on of women's knowledge, let alone the latest understanding of epigenetic influences, but instead imparts an abjectified, technological instrumentalization of birth, women's bodies and motherhood. The obsolescence of anatomical model making skills, combined with the mass-productivity found in contemporary obstetric models represents a devaluation of motherhood. How mothers perceive themselves is formulated from how mothers are framed and described within society and in artefacts such as this. The mass-production of three-dimensional medical models that are gruesome and barbaric subjugates and disempowers mothers in medical settings. It is important to challenge and reform such representations by portraying alternative maternal realities, that incorporate positive epigenetic influences which are passed on from mother to child; just as it is important for artists to create female anatomical models that represent something of the complexity and materiality of lived maternal experience. By animating the materials in my obstetric medical models I hope to deliver a visual criticality that can represent the interplay of socio-medical and environmental agency, compounding, complicating and materialising through the gestating body in complex ways. As Alaimo and Hekman (2008: 3 - 4) argue:

> the postmodern (…) retreat from materiality has had serious consequences for feminist theory and practice [but that] we need a way to talk about these bodies and the materiality they inhabit. Focusing exclusively on representations, ideology, and discourse excludes lived experience, corporeal practice, and biological substance from consideration. It makes it nearly impossible for feminism to engage with medicine or science in innovative, productive, or affirmative ways – the only path available is the well-worn path of critique.

By remaking medical models that erase the line between the biosocial and natural worlds, I am speaking of maternal lived experiences in affirmative ways, which will hopefully ignite dialogue, because to date at least, the positive attributes which mothers imprint on their offspring appear to receive very little exposure or recognition within current epigenetic scientific enquiry.

Aligning low maternal socioeconomic status as epigenetically causal to infant ill-health fails to consider the complexity of the embodied 'cross-stitching' from societal inequity that may result in offspring adversity. As Singh (2012: 314) states:

> The idea that social class disparities have a biology, and that this 'biology' explains poverty is the sort of scientifically erroneous nonsense that gives developmental biology a bad name.

It is not 'social class' that creates a biological difference, but rather structural processes in which subjugation and injustice ensures those lacking the 'power of choice' experience marginalisation, and thus endure a heightened toxicant exposure, depleted nutritional intake, impoverished or dangerous living conditions and a range of adverse health effects that accompany such inequalities. While it is not my intention to denigrate epigenetic enquiry, it is important to address the sort of convoluted suppositions which are associated with reduced maternal socioeconomic status that are not always quantifiable or identifiable. My medical models are an attempt to rewrite the canonical perspective of how the maternal body has been medically and scientifically understood; they are intended to challenge these perspectives by introducing and foregrounding new epigenetic findings such as environmental influences that impress/imprint upon the maternal body. Outdated reiterations of derogatory institutional obstetric models that fail to consider maternal lived experiences and life circumstances, but instead convey inaccurate and invalidating social conceptualisations of motherhood perpetuate harmful messages. It is ethically important to address or challenge injurious epigenetic discourses for fear they become further embraced by the public, resulting in discriminatory ideas regarding marginalised or socially excluded mothers who are judged to be disadvantaging their offspring. Instead, *Silver Spoon* and *Fertile Garden* create a competing visual epistemology

that questions conventional hierarchies regarding economic status, and instead more accurately convey some of the complexities and entanglements that play through maternal and foetal bodies. My obstetric models are intended as timely reminders that maternal representations which quantify and value epigenetic influences that are based on economic status alone, fail to recognise the intergenerational privilege and importance of having access to a rapidly disappearing clean, natural environment.

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