

BOOK REVIEW

## Caroline Arni, *Of Human Born: Fetal Lives 1800–1950*, tr. Kate Sturge

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In the early 1880s, the French psychiatrist and experimental scientist Charles Féré took an interest in a cohort of children conceived and born during the German siege of Paris in 1871. The siege and its aftermath, including the short-lived Paris Commune and its bloody end, caused much deprivation and stress. Years later, it became clear to Féré and his colleagues that the maternal physical and mental suffering somehow caused ‘developmental disturbances’ manifested in symptoms as varied as epilepsy, ‘intellectual abnormalities’, stuttering and hearing loss. What was it that exerted this ‘influence’ upon the unborn? How did maternal ‘trauma’ in 1871 – a term whose meaning expanded from physical wound to psychological phenomena exactly in this period and right there at Bicêtre where Féré worked under Jean-Martin Charcot – manifest itself in the child’s manifold symptoms decades later?

In *Of Human Born* – an English translation by Kate Sturge of *Pränatale Zeiten: Das Ungeborene und die Humanwissenschaften (1800–1950)* (2018) – Arni uses the story of ‘the children of the siege’ as both a hook and the bookend for her exploration of how European experimental and clinical scientists created a novel ‘epistemic space’ of prenatal life by building on the knowledge and methods of new biological disciplines but also elements of the old concept of ‘maternal impressions’.

This book is a much-needed addition to the rich historiography of heredity, development and reproduction of the past decades. We now know how, in the early nineteenth century, ‘heredity’ was created as a material entity passed across generations. Around the same time, procreation transformed from *generation*, a creative process in which a new being is made from maternal and paternal contributions under environmental conditions, into *reproduction*, in which hereditary traits are faithfully, almost mechanically, copied from parents to offspring. We also know how debates between proponents of preformation and epigenesis over when and how life is created was resolved, by the late eighteenth century, not by the victory of epigenesis, as is often interpreted, but by changing the core research question into: what are the rules of development? To answer this question, embryologists collected and dissected animal and human abortions to build developmental series. Underexplored until now was how, during the same period, experimentalists and clinicians constituted the living, developing organism as a research subject and as a patient. Arni engages this question in three parts: situating this research in the broader disciplinary landscape, examining

experimental research on living developing organisms and, finally, showing how clinicians used and interpreted fetal physiology to interpret child psychology.

A key part of experimentalists' endeavour was forming research questions. Early on, Xavier Bichat and others wrestled with questions originating in antiquity: when does a fetus become truly alive? For Bichat, birth was the consequential moment when life was both transformed and doubled: the fetus became 'living' but also, through its newly acquired exteriority, 'animated'. Birth was far less significant for others, starting with Pierre-Jean Georges Cabanis. In his "Die Seele des Kindes" and "Specielle Physiologie des Embryo" William T. Preyer argued that the fetus felt, moved and experienced pleasure and displeasure before, across and after birth (p. 91). However, this question would resurface again in the twentieth century in the very discipline that centred child psychological development – psychoanalysis – when Otto Rank took the separation at birth as the ultimate source of all the trauma – an argument that Sigmund Freud, interested in both ontogenetic and phylogenetic trauma/potential of the development, vehemently rejected (pp. 182–95).

Studying the unborn was challenging. Not only was the experimental subject hidden inside the maternal body, but it was also hard to pin down: it was constantly transforming. Scientists tried to contain the elusive subject, 'to ascertain for each separate phenomenon in the course of life its historical place, and its relationship to what was before it and what will come after it' (Ignaz Döllinger quoted on p. 78). Experiments were often gruesome: experimentalists opened sheep, rabbit and cat bellies; cut amniotic membranes; and drained amniotic fluid to observe the fetal movement. They also travelled, if modified, between humans and animals: Lester Sontag provoked audiogenic seizures in pregnant rats and subjected pregnant human patients to sensory stimuli to observe fetal movements in response (p. 204). Human newborns were proxies for the fetus: the Austrian psychiatrist Silvio Canestrini affixed metal caps with a pneumatic spring to the anterior fontanelle (soft spot) to measure brain response when he exposed infants to sounds and visual stimuli (pp. 176–81). In the mid-twentieth-century United States, philanthropy and public infrastructure provided resources to capture longitudinal data, from maternity wards, school registers and statistical offices, to clarify the link between prenatal environment and childhood health (pp. 204–10).

To constitute the fetus as a research subject and prenatal life as an epistemic space, researchers first had to establish mother and fetus as separate organisms. The placenta, which separated and linked them, presented a puzzle: although there was no direct communication between maternal and fetal bloodstreams, substances – nutrients and toxins – travelled across this 'organ of relation'. This passage of toxins – morphine, or germs of scarlatina and syphilis (p. 112) – provided a model for influences of other kinds, including those of a psychological and emotional nature. The early twentieth-century boom of hormonal research provided a solution: the mother and the fetus communicated not through direct contact but through chemical messengers. But, if their communication was akin to the hormonal circulation within an organism, then should this dyad not be considered a single organism too?

Many scientists discussed in the book will be familiar to historians of nineteenth-century biology and medicine, and one of Arni's many excellent contributions is linking the scholarship on heredity and development with that on experimental physiology. For me, the greatest value is that it provides the missing piece in the long history of understanding the relationship between the developing organism and the 'environment' – the mother and the physical and social world that she inhabited, sitting between the rejection of 'old' maternal impressions and Lamarckism and the late twentieth-century interpretations in the form of DOHaD (developmental origins of health and disease) and epigenetics.