Cutting Edge Research in the Contact Zone? The Establishment of the Nutritional Research Laboratories in Coonoor (1925–27)


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ABSTRACT

By 1928, Robert McCarrison’s laboratories in the South Indian hill station Coonoor had become recognized as the centre for nutritional research in India. Five years earlier, however, his institute had faced closure. This article argues that the establishment of McCarrison’s institute was based on his pitch to the Royal Commission on Agriculture in India in 1926, in which he successfully aligned his research to satisfy the concerns of various members of the commission. This discussion uses McCarrison’s lobbying for his centre as a case study to examine the broader political manoeuvrings that colonial scientists in the early twentieth century often had to undertake to establish their research agendas.

Keywords: Colonial Science, Laboratories, Nutrition, Agriculture, Race

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1 I wish to thank the South Asia reviewers as well as Ian Miller, Emma Reisz, John Lourdusamy, Joanna Simonow and my co-editors for improving this article.
In 1935 Sir Robert McCarrison retired from the Indian Medical Services as the Director of the National Institute of Nutrition in Coonoor, Tamil Nadu. Upon departing from India, he might have reflected on how far his research institute had progressed from its humble beginnings. Indeed, his laboratories in Coonoor had acquired significant funding from the Government of India (GOI) and had become established as the national centre for nutritional research in India. Yet in the 1920s, McCarrison’s research agenda was in a precarious situation and his institute in danger of being closed.

David Arnold and James Vernon have acknowledged McCarrison’s role in establishing nutritional research in India. However, the challenges McCarrison faced to secure funding for his institute have escaped scholarly attention. Vernon in particular lauds McCarrison’s efforts in undermining the notion that diseases of deficiency in India were due to environmental factors, demonstrating that McCarrison’s experiments drew attention to the manner in which diseases of deficiency arose from poor diets, common both to British and Indians.2 Michael Worboys has discussed McCarrison’s work broadly within the context of the ‘discovery’ of colonial malnutrition as an imperial problem in the interwar period that affected the agricultural and economic productivity of European colonies.3 This article, however, examines the processes by which McCarrison created his reputation as a nutritional research pioneer and how by the 1930s, his Coonoor laboratories came to be considered India’s primary nutritional research centre.

I argue that the establishment of McCarrison’s nutritional laboratories had less to do with the rigour of his scientific research, and more to do with his tactical skills. In this

respect, I will demonstrate how McCarrison took advantage of the fragmented manner that imperial public health was administered to secure institutional support. Whilst David Arnold and Randall Packard have mentioned briefly his pitch to the Royal Commission on Agriculture in India (RCAI) in 1926, they have not fully explored its significance. The RCAI had been established earlier that year ‘to investigate the conditions of agriculture’ and make recommendations to the GOI’s Department of Agriculture and Lands concerning how to increase the ‘prosperity of the rural population’, as well as to coordinate efforts with local governments on specific measures that could be implemented to improve agricultural practice.

The RCAI panel was made up of Lord Linlithgow (the Chairman of the Commission), Nagendranath Gangulee (a Professor of Agriculture and Rural Economics at the University of Calcutta), Sir Lala Ganga Ram (a civil engineer), Sir Henry Staveley (the Acting Governor of Bombay), Lodhi Karim Hyder (a Professor of Economics at Aligarh University), Sir James Mackenna (a Civil Servant), Hubert Calvert (a Civil Servant), Balkrishna Sitaram Kamat (a Bombay Legislator), Sir Thomas Middleton (Professor of Agriculture at Baroda College and Deputy General of the Food Production Department), and Rajah Srikrishna Chandra Gajapati Narayana Deo Garu (the Rajah of Parlakamedi). In this respect, it consisted of a diverse range of actors ranging from Indian and British senior civil servants, leading government officials, agricultural scientists, economists, and an Indian raja. The striking feature of the

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4 The colonial state’s structures were fractured, with various administrative bodies at provincial and all-India levels competing to defend their own interests. See Sanjoy Bhattacharya, Mark Harrison & Michael Wroeby, Fractured States: Smallpox, Public Health and Vaccination Policy in British India, 1800-1944 (Hyderabad: Educa Books, 2005), pp.7-8.


7 See London Gazette, April 27, 1926, no. 2858.
RCAI panel, though, was that five out of the ten of its members were Indians. This, as I will demonstrate, was a concession to nationalist demands during this period for greater inclusion in the decision-making process when it came to the development of Indian agricultural and scientific research. Yet it also affected the ways in which McCarrison promoted his research to the commission. I argue that on one level, he aligned his research interests to suit the GOI that wished to increase the efficiency of its colonised workforce, animal livestock, and military recruits. Yet at the same time I am concerned with the ways in which he appealed to the differing demands of Indian members of the commission, who sought opportunities for Indian scientists and research institutes and were eager to promote the health of the next generation of Indians. McCarrison demonstrated strategic skills in both satisfying the differing interests represented in the commission, as well as in successfully bypassing the authority of the Indian Research Fund Association (IRFA), who originally funded his research. In this respect the increased funding that he managed to secure was because he was able to take advantage of what Arnold has noted to be a transitional period in imperial science in colonial India, where the IRFA’s power base was being contested, and other sources of patronage becoming available. Moreover, the RAI, which he appealed to, was open to the proto-nationalist concerns which he had to satisfy in his funding pitch.

McCarrison’s lobbying for a nutritional research centre might be seen as a case study to examine the political manoeuvrings that a colonial scientist working in British India in the 1920s had to resort to in order to receive patronage. Previous scholars concerned with the development of colonial scientific institutes in the late nineteenth and early twentieth century

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8 The IRFA was established in 1911 to finance and coordinate scientific research in India. See David Arnold, ‘Colonial Medicine in Transition: Medical Research in India, 1910-47’ in South Asia Research, vol. 14 no. 1 (spring 1994), pp.10-35.
9 Similarly to McCarrison, the geologist Dr E. Pascoe, the mycologist Dr W. McRae and the agricultural chemist Dr W Harrison made RCAI funding applications, where they stressed their collaborations with other research centres in India, their interdisciplinary methods and research positions that they could offer Indian science graduates. See RCAI vol. 1, part 2, pp.117-123, pp.225-237 & pp.261-284.
have rightly demonstrated how such centres were integral to framing imperialism as a modernising rationalist force. My micro study of the establishment of McCarrison’s Nutrition Research Laboratories at Coonoor is intended to offer another dimension to the existing historiography by identifying how, within this broader process, individual scientists managed to secure their own interests, and the ways in which influential Indians exerted leverage. Thus, this paper provides a corrective to largely top-down scholarly approaches which examine the establishment of imperial science endeavours in the colonies. Before delving into these matters, it is pertinent to examine McCarrison’s career prior to the establishment of his institute.

Robert McCarrison’s Early Career

McCarrison trained as a medical practitioner at Queen’s College Belfast, qualifying in medicine in 1900 at the Royal University of Ireland in Dublin. After graduating, he enlisted in the Indian Medical services (IMS) and began his career serving as a regimental medical officer in Chitral (in North West India, now Pakistan).10 He later rose to the level of Agency Surgeon in Gilgit, where he served from 1904-1911. McCarrison was promoted to the rank of Major and, in 1912, was transferred to the Central Research Institute in Kasauli, Punjab, where he took up a research position.11 As McCarrison’s research progressed he became interested in establishing the correlation between diet and disease.

In 1918, McCarrison received an IFRA research grant to head a Beriberi Unit at the Pasteur Institute in Coonoor, in Tamil Nadu.12 The Pasteur Institute was established in 1907

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to study and provide a vaccine for rabies, although later the institute became concerned with investigating other bacterial diseases. Imperial laboratories served as symbols of colonial modernity against the allegedly backward backdrop of India. Pasteurian institutes, established in both British and French colonies in Asia and Africa in the late nineteenth and early twentieth century, aimed to create vaccines as part of an effort to eradicate diseases. In practical terms, they enhanced the colonial state’s capacity to exploit indigenous labour. Furthermore, they were discursively useful in terms of justifying the colonial civilising mission, as they created the impression back home that colonial medicine was eradicating disease from pathologically diseased colonised locales.

Notably, McCarrison’s early nutritional research was limited in scale; he was granted only a spare room and a microscope at the institute. Mula Singh, a former soldier and a Sikh, who had received no formal scientific laboratory training, was his only assistant. Nevertheless, it was here that McCarrison had an opportunity to test his hypothesis that variances in diet were responsible for the allegedly differing physical and moral characteristics of different ‘races’ within India. Beriberi was a pretext for him to investigate the effects of diet on physical characteristics and behaviour. Thus, at this stage, before nutrition had gained status as a scientific topic necessitating an all-India institution devoted to it, McCarrison had to present his research interests as being focused on a specific disease.

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17 Beriberi is caused by a thiamine deficiency. It is common where white polished rice is the major part of the diet, with the milling process removing the outer husk and inner skin of rice grains. This removes the thiamine content. The symptoms include impaired sensory perception, weakness, pain in the limbs and an irregular heartbeat. Beriberi outbreaks spiked in the Dutch East Indies, India, and
At the same time, nutritional research had gained ground in Britain during World War I. The depleted food supplies available for the civilian population during the war, along with the need to adequately feed its soldiers, meant that the British government was attentive to issues of food security and willing to sponsor laboratory-based nutritional research. The issue of nutrition was further gaining international attention with the League of Nations Health Organisation increasingly becoming interested in promoting health standards in Africa and Asia. The raising of the nutritional health of inhabitants based in these regions played a crucial role in this broader effort.

Within this context, more studies were conducted in Asia and Africa that sought to determine universal nutritional standards and to identify possible means by which the nutritional health of indigenous populations could be raised. Researchers such as John Boyd Orr and John Gilks in Kenya, for example, conducted experiments focussing on how the different diets of the Kikuyu and Masai peoples affected their physical health. British researchers sponsored by the IRFA, such as McCarrison, followed suit and engaged in their own nutritional investigations.

Notwithstanding the growing international interest in nutritional research, McCarrison initially faced difficulties establishing a Beriberi research unit, which was axed in 1923 on the recommendation of the Lord Inchcape Committee in an effort to downscale government expenditure. The unit did reopen in 1925, but this time operating as the ‘Deficiency Disease Japan from the 1870s onwards because of the proliferation of mechanized milling, leading later to studies being carried out in this field by British, Dutch, and Japanese scientists working in these regions. See David Arnold, ‘British India and the “Beriberi Problem”, 1798-1942’ in Med History 53, no. 3 (July: 2010): pp.295-314.  
18 Vernon, Hunger, pp.91-4.  
20 Ibid, pp.80-81.
Enquiry’. This institute would also have likely been axed, had McCarrison not presented his research agenda in a manner more in line with the concerns of the visiting RCAI.

Rat Experiments and the RCAI

In 1925, McCarrison embarked upon an experiment which saw seven groups of rats provided with different diets, supposedly typically consumed by specific races within India. According to the experiment, the rats who consumed the diets of the so-called martial races (the Sikhs, Marathas, and Pathans), consisting of a high content of buttermilk, leafy vegetables, a small quantity of meat, and chapattis made of wholemeal wheat, weighed the most, had the lowest mortality rates, and suffered less from ailments during their lives. They also lived in a contented fashion within their own groups. The two worst performers were the rats provided with the Bengali and the ‘Madrassi’ (or South Indian) diets, who were reported to have become emaciated and restless. These two groups were provided with a diet consisting of white imported milled rice, watery dhal, a small quantity of fish and vegetables. The Bengali and South Indian diets were thought to be especially detrimental because of their reliance upon milled rice, with the processing thought to remove vital vitamins present within what was in any case a poor cereal nutritionally, and because their diet was lacking in protein, vitamins and minerals.

The results of McCarrison’s experiments neatly aligned with ‘martial race’ discourses perpetuated by the military in the wake of the 1857 Indian Uprisings, which particularly denigrated Bengalis as duplicitous for their role in the Uprisings, shifting the recruitment patterns for the colonial army shifted to the North West of India. ‘Races’ who were deemed

to have been loyal, such as the Sikhs, Marathas, and Pathans, were now valorised in colonial discourse for their supposed manly qualities. These martial-race formulations clearly informed McCarrison’s science. His information regarding the diets consumed by different ‘races’ of Indians was heavily derived from the earlier medical research undertaken by David McCay based at Calcutta Medical School (1910-12). Moreover, the colonial scientist’s formulations of what foodstuffs different groups of Indians consumed was, with exception of the ‘Kanarese’, the ‘Madrassis’ and ‘Hunzas’, largely based on the stereotypical and impressionistic formulations of the dietary habits constructed by McCay more than a decade earlier. Naturally, these rigid categorizations of the differing Indian ‘races’ were even more problematic in 1920s colonial India. As Gajendra Singh has argued post World War I, there was recognition within British military circles in India that earlier martial-race categorisations formulated in the late nineteenth century were imperfect, and that in fact identities were more fluid than previously thought. Following from earlier colonial ethnographies, McCarrison’s clear-cut division of Indians races treated them as separate categories which were homogenous, making no allowance for distinctions of class, caste and

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24 Malhotra, Race, Diet and Class: Robert McCarrison’s Laboratory Experiments, p. 20.
25 The photographs in McCarrison’s posters and published work of the stock representative Sikh, Maratha, Pathan and Bengali men were culled from McCay’s work (see Poster of the Diet and Physique of Indian Races Displayed to Visitors of Robert McCarrison in Robert McCarrison File ‘Posters’ GC/205/A in Wellcome Trust Library [henceforth WTL]. The Robert McCarrison archive, held at the Wellcome Trust, holds McCarrison’s outgoing and incoming correspondence, a photograph album documenting his time at Coonoor, and posters which were displayed at his research institute & David McCay, The Protein Element in Nutrition (London: Edwin Arnold: 1912), p.912, p.59, p.109, p.205. The other sources he relied upon to determine what different Indian ‘races’ ate are sketchy. In an article co-authored with the agricultural chemist Roland Norris, data drawn from Madrassi prisoners are mentioned without further detail. See Robert McCarrison and Roland V. Norris, ‘Memoir no. 2, Oct. 1924: The Relationship of Rice to Beriberi in India’, in The Indian Journal of Medical Research xxii (1924-25): p.32. McCarrison’s information regarding Indian diets was likely supplemented by the input of his various Indian research assistants, and with regard to the Hunza diet his own previous interactions with them as a regimental medical officer in Gilgit.
levels of economic prosperity within those groups. In McCarrison’s paradigm, ‘race’
determined dietary choices.

Crucially, McCarrison’s research team did not conduct any surveys to assess what
people living in different regions of India ate.27 It also has to be remembered that as Catriona
Ellis points out, at around the same time McCarrison was conducting his rat experiments,
medical inspectors working for the Madras Corporation under the direction of Indian
councillors, were conducting investigations of schoolchildren based in the region to assess
their differing levels of nutritional health. Their investigations, unlike McCarrison’s, took
account of the fact that families belonging to an ethnic group could not be homogenized and
that their access to foodstuffs varied depending on their levels of income.28 McCarrison,
however, retained McCay’s formulations of what different Indian races ate as a premise for
his investigations, largely for convenience. Thus, from the outset there was, even for the
standards of the day, a lack of empirical rigour to McCarrison’s experiments, in addition to
the conceptual flaw upon which they were predicated.

The key difference between McCarrison’s and McCay’s findings regarded the
necessity of meat consumption. McCay argued that it was the high consumption of animal
protein in the diet of the martial races that accounted for their supposed physical and
intellectual superiority over other Indian races.29 By the time McCarrison was conducting his
research, however, this assumption had been challenged as nutritional scientists in Europe
and the USA, such as Casimir Funk, Elmer McCollum and Frederick Gowland Hopkins, had
conducted studies which stressed the importance of a more balanced diet consisting of a

27 This would be the task of Wallace Aykroyd, K. Rajagopal and B. G. Krishnan, who
conducted nutritional research at Coonoor after McCarrison had departed.
28 See Catriona Ellis’s article in this volume.
range of vitamins, minerals, and proteins. Influenced by this newer trend of research, McCarrison’s ideal diet was one consisting of milk or milk-based products, leafy vegetables produced without the aid of chemical fertilizers, and wheat-based foodstuffs. Meat in small quantities was beneficial, but by no means essential. Milk, in McCarrison’s view, was a perfectly adequate source of protein. In this respect, his findings could be discursively employed by high-caste Hindu organisations that were prevalent during this period. Indeed, the privileging of milk over meat as a source of protein would have aligned with movements such as the Arya Samaj or various cow protection societies who gave quasi-religious importance to the cow as a milk provider.

In addition to McCarrison’s findings resonating with certain high-caste Hindu beliefs, they provided solutions to a colonial administration seeking to boost male labour power and the strength of Indian soldiers. The experiment inferred that ‘inferior’ races could be ‘improved’ by changing their diets in line with those consumed by the Sikhs, Marathas, and Pathans. The other subtext of the experiment was that if Indians were well fed, they would become productive and contented subjects who were less likely to offer dissent.

McCarrison displayed this experiment to the RCAI, who visited the Coonoor laboratories in 1926. It had also that year visited agricultural research institutes that in Bangalore, Pusa, and Coimbatore that year, interviewing prominent agriculturalists, dairy

31 Such organisations often justified casteist and sectarian incensement directed at Muslims and Dalits for killing cows for beef, on rationalist grounds, arguing that cows provided milk which could feed a greater number of people for longer, than if they were killed for meat. Many high-caste Hindus would be receptive to the nutritional superiority of milk as it provided scientific legitimation for their beliefs. See Julia Hauser’s article in this volume and Sambaiah Gundimeda & V. S. Ashwin, ‘Cow Protection in India: from Secularising to Legitimating Debates’ in *South Asia Research* vol. 38 no. 2(2018), pp.156-176, pp.158-164.
32 A concern for how subordinate groups behaved when provided with differing diets is evident in McCarrison’s observations for his experiments. The rats presented with diets supposedly typically eaten by the ‘poorer European classes’, ‘Madrasis’ and ‘Bengalis’ became ‘nervous’ and did not live happily amongst each other, with the rats provided with the diet of the ‘poorer European classes’ even reported to ‘bite attendants’. The well-fed Sikh rats in contrast lived happily together as a group. SeeMalhotra, *Race, Diet and Class: Robert McCarrison’s Laboratory Experiments*, p.21.
experts, sugar experts, mycologists, bacteriologists, geologists, chemists, botanists, and statisticians. The appointment of the RCAI needs to be contextualised in relation to the GOI’s greater efforts to discover methods to improve agricultural development in the subcontinent in response to the famines of the 1860s and 70s as well as to an Indian intelligentsia increasingly advocating for agrarian reform from the 1890s onwards. This GOI’s increasing interest in these matters was mainly motivated by a desire to safeguard land revenue, maximise profits and offset peasant discontent. In addition to this, we see in the early twentieth century North American missionary organisations taking up the cause of improving agricultural practices in India. Thus, the RCAI emerged within a broader milieu where the GOI and external American Missionary organisations were seeking to make interventions into Indian agricultural practices.

The RCAI was impressed by this visit to McCarrison’s institute. The Rajah of Parlakamedi gave McCarrison a lakh of rupees (approximately £7000) to create two new Parlakamedi Research Fellowships for Indian scientists, allowing for the chemist S. Ranganathan and the biochemist G. Sankaran to take up posts at the institute. McCarrison was summoned later that year by the commission to Madras, where he presented them with a memorandum justifying his research and was interviewed by the panel.

In McCarrison’s memorandum he claimed that ‘malnutrition’ was ‘the most far-reaching of the causes of disease in India’. McCarrison argued that poor nutrition in both humans and animals was linked to substandard soil quality. According to McCarrison, cattle

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34 For instance, the American Presbyterian Mission established the Agricultural Institute at Allahabad in 1912, with Sam Higginbottom, the British director of the institute, seeking to improve the agricultural education curriculum in India. The American Presbyterian Mission also sponsored John Goheen to introduce an agricultural programme in Sangli, in Maharashtra (West India), to meet the demands of local farmers. Ibid.

35 RCAI vol. 1, part 2, p.96.
and sheep grazing within the environs of this soil became consequently inefficient in their milk yields. Humans reliant upon the milk of sheep and cows as well as the crops which were produced from inferior soil were physically affected, leading to farmers being too depleted to exploit the soil. McCarrison advocated for nutritional and agricultural research to be tied together, drawing attention to how his own preliminary investigations based on his collaborations with agricultural scientists working for both the Government of Madras and the Agricultural College, Coimbatore, had led to the discovery that millet grown with farmyard manure in South India had a much higher vitamin A content than other forms of millet. McCarrison argued that people and animals that lived off foodstuffs grown on soil rich in vitamin A were less susceptible to infectious diseases. Consequently, the colonial scientist proposed a holistic approach which professed to chart deficiency from the soil, through vegetable and animal life and then finally to humans. He correlated the causes of poor nutrition to farming methods that did not preserve the nutritional quality of crops, and to the overproduction of a cereal such as rice, which did not contain the necessary minerals and vitamins to sustain a productive individual. McCarrison’s research was framed in economic terms; it was about maximising resources by enhancing the physical efficiency of Indian labourers, boosting agricultural yields, and improving existing animal stocks.

It is significant that McCarrison presented nutritional science as an interdisciplinary endeavour which combined agricultural and chemical laboratory-based methods. It marks a repositioning from earlier nutritional research undertaken by McCay, who viewed nutrition within a medical-chemical paradigm. In this respect his research needs to be placed within the context of the interwar period, where malnutrition in the colonies was increasingly seen

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36 Ibid, pp.97-98.
37 Ibid.
through broader interdisciplinary frameworks. Crucially, McCarrison’s memorandum drew attention to the parallel findings of Albert Howard. From 1924-1931, Howard was the Director of the Institute of Plant Industry at Indore and in the process of developing an aerobic composting method known as the Indore Process. Howard stressed holistic approaches to agriculture. Howard saw the soil as teeming with micro-organisms which were essential to the healthy cultivation of crops. He argued that organic fertilisers, rather than chemical ones, were more conducive to the long-term health of the soil because, according to him, they encouraged these micro-organisms to flourish. McCarrison’s advocacy of a holistic approach to agriculture and nutrition chimed with Howard’s – establishing parallels between his research and that undertaken by the leading agricultural scientist in India at the time clearly bolstered McCarrison’s case. Furthermore, by emphasizing the agricultural aspects of his research, he cannily placed it in line with the RCAI’s remit.

Bruno Latour, in *The Pasteurization of France*, has argued that Pasteurian science gained traction in the late-nineteenth and early-twentieth century because of the ability of Pasteurians to forge strategic alliances with hygienists, physicians, and various social movements. Pasteurians posited the centrality of microbes to all illnesses. Latour’s analysis of Pasteurian strategies is helpful when considering those employed by McCarrison. Yet instead of ascribing the spread of diseases to microbes as Pasteurians had done, McCarrison represented nutrition as the primary cause for diseases, arguing that if bodies were properly fed, they would be able to fend off diseases. McCarrison thereby attempted to establish a new

38 Malnutrition was increasingly viewed during this period as a phenomenon that could be solved with the cooperation of agriculturalists, nutritional experts, doctors, anthropologists and economists. See Worboys, *Discovery of Colonial Malnutrition*, p.221.
paradigm for understanding the root cause of diseases. McCarrison’s emphasis on the supposed synergies of these disciplines was intended to emphasize the significance of his own nutritional research, advocating that all these research interests needed to be placed under ‘broad-minded direction’. Without explicitly saying so, McCarrison proposed to coordinate these different agendas, as well as ‘translate’ them.

Lord Linlithgow, the Chairman of the Commission, requested McCarrison to highlight how nutrition affected the ‘economic capacity of the individuals’ and formulate solutions. In this respect the commission’s concerns aligned with what Gyan Prakash has described as a form of colonial governmentality in which the colonial state seeks to collect a range of information about its subject population and to optimise the bodies of its subjects for its own ends. In this case, the Commission sought to harness the power of its animal and human subjects for economic profit. Whereas previously, when the RCAI had visited McCarrison at his institute they mainly bore witness to his rat experiments, at the panel interview he presented them with an array of statistical and visual material.

McCarrison’s pointed out the Commission the superior nutritional qualities of whole wheat, grown with the aid of grown with the aid ‘cattle’ or ‘farm-yard manure’, over rice which was commonly eaten by Indians residing in the Madras Presidency. He proposed substituting rice for grains such ‘cholam’ and ‘cumbu’ which ‘were in common use in

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41 RCAI vol. 1, part 2, p.98.
42 Ibid, p.100.
44 For instance, they were presented with a bar chart which supposedly demonstrated that ‘that the greatest prevalence of leprosy is among the people who use the poorest food’, a line graph which compared the body weights of different groups of rats whose diets included or did not include vitamin supplements (a, b & d), rice and wheat. The graph supposedly demonstrated that those rats fed a diet which incorporated wheat recorded the greatest bodyweight. There was a line graph that demonstrated that rats provided with whole wheat acquired much greater bodyweight than those provided with white flour. RCAI vol. 1, part 2, see p.101 & various charts in appendix to evidence after p.116.
Moreover, he stressed the need for cattle manure to be used for the growing of millet and whole wheat, which would, unlike a chemical fertiliser, boost the vitamin content of these cereals. Central to McCarrison’s argument was that substandard human nutrition, animal husbandry, and farming were not predominantly linked to poverty, but to cultural habits of different Indian ‘races’. McCarrison implied that atta (wheat) was cheaper than rice. If Indians living within the environs of Madras changed their dietary staple by substituting rice for other locally grown grains such as cholam or cumbu, as well as drank more milk and ate more green vegetables, they might attain physical and moral capabilities similar to those of the wheat-eating ‘martial’ races of the north. This would only require a shift in both agricultural production and dietary habits. Failing that, a transition from milling rice through intensive par-boiling methods which removed the outer husk of rice to more traditional methods would lead to improvement.

McCarrison made a universalistic assertion of what human bodies required. His experiments sought to demonstrate how deficient diets debilitated white Europeans and Indians in similar ways and that their nutritional requirements were identical. However, discrepancies between the physical characteristics between different ethnicities in India, in McCarrison’s view, were not primarily due to economic disparities. Addressing deficiency was not a case of alleviating poverty or increasing the purchasing power of Indians to feed

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45 RCAI vol. 1, part 2, see p.97 & p. 101. Chemical manures in this context refer to chemical fertilizers and the Presidency here refers to the Madras Presidency.
48 The idea of racially-specific dietary needs was the subject of well publicized debates in nineteenth century colonial India between Richard Temple and Surgeon Major General William Robert Cornish. Temple, an administrator with no scientific training, conducted dietary experiments during the famine in 1877 on Indians in Madras labour camps to determine the minimum diet necessary for sustenance. He drew on these experiments to argue Indian bodies had different dietary requirements to white Europeans, justifying limited efforts undertaken by the Government of India to engage in famine relief or to provide rations for hospitals and prisons which housed Indians. Cornish disputed that there were distinct dietary requirements and called for greater provisions. Dana Simmons, ‘Starvation Science: From Colonies to Metropole’ Ch. 10 in *Food and Globalization: Consumption, Markets and Politics in the Modern World* (Berg Publishers: New York, 2008), pp.173-192, p.176.
themselves properly, but of shifting agricultural production priorities and effecting a change in dietary habits. His research thus did not engage in a critique of colonial economic policy per se and was therefore calculated not to offend colonial sensibilities. In this respect McCarrison’s conclusion was at odds with those later expressed by Nagendranath Gangulee, a member of the RCAI interviewing McCarrison and Professor of Agriculture and Social Economics at the University of Calcutta. While Gangulee’s views were not widely broadcast at the time of the RCAI delegation in 1926 in his work Health and Nutrition in India (1939), he convincingly correlated famine and malnutrition to colonial exploitation.

McCarrison’s remarks to the RCAI must be contextualised in relation to a growing trend by colonial scientists and scientists working for internationalist organisations to move away from a paradigm of viewing malnutrition in the colonies as being caused by poverty brought on by colonial economic policies to depicting it as being exacerbated by the ignorant agricultural and dietary practices of the ‘natives’ themselves. The problem of malnutrition, according to this paradigm, rather than requiring radical reform, could be offset by technical changes to agricultural practices and through educating indigenous populations. In this respect the work of European colonial scientists and internationalist organisations marked a significant contrast to the efforts undertaken by the Madras Corporation which, in 1925, introduced midday free meal scheme for children enrolled in schools in the region of Madras. This was a state intervention directed by Indian councillors of the Corporation, only one year

49 Romesh Dutt convincingly correlated British economic exploitation in India to widespread agrarian poverty leading to widespread famines. See Romesh Dutt, Indian Famines: their Causes and Prevention (London: P. S. King & Son, 1901).
50 Worboys, Discovery of Colonial Malnutrition, p.221 & Packard, History of Global Health, 80.

McCarrison’s findings present a contrast to the radio broadcast he delivered for the BBC in 1937. In this radio series, designed to raise the nutritional health of the British public, McCarrison argued, along with John Boyd Orr and Dr George McGonigle, that British lower-class families failed to incorporate protective foods, such as leafy vegetables and milk in their diet due to poverty and being unable to purchase these foodstuffs. Thus, in Britain itself McCarrison was ready to acknowledge the real effect of poverty in people’s dietary choices. See BBC/PP/GMG/B12 File in WTL. This file holds correspondence between the BBC and George McGonigle, relating to McGonigle’s, McCarrison’s and Orr’s BBC broadcasts.
prior to McCarrison presenting his evidence to the RCAI, to address what it recognised to be the major role poverty played in the nutritional health of Indian school children.51

The Indian interviewers Lala Ganga Ram, Nagendranath Gangulee, Lodhi Karim Hyder, Balkrishna Sitaram Kamat and Srikrishna Chandra Gajapati Narayana Deo Garu (the Rajah of Parlakamedi) were concerned with the implications of McCarrison’s research for the subcontinent. Dr Lodhi Karim Hyder, Professor of Economics at Aligarh University, asked him if MSc biochemistry, medical and graduates from Indian universities could receive training at his institute. Both Kamat, a Bombay Legislator, and the Rajah of Parlakamedi were both concerned with how McCarrison’s research, with the aid of Indian assistants, could be disseminated in accessible translated forms for young Indians in school textbooks and pamphlets. The Indian interviewers enquiries also were generally interested in McCarrison’s possible collaborations with ‘native’ scientists and centres within India and the relevance of his research to Indians.52 Nation building, regional development, and improving the prospects for a coming generation of Indian scientists were their priorities. Moreover, they were anxious about Indians becoming physically debilitated by following European culinary tastes such as drinking lemonades, aerated waters, and eating tinned foods.53 Clearly there were anxieties among the Indian members about the detrimental effect that western dietary trends were having on affluent young Indians. At least one of the Indian members of the RCAI subscribed to martial-race theories, with Kamat asking McCarrison as to what ‘advice’ he would ‘give to the Madras people to attain the same efficiency as the Punjab people’, thus

51 See Catriona Ellis’s article in this special issue.
demonstrating that it was not solely British colonial administrators who were responsible for perpetuating these stereotypes.54

The Indian members of the RCAI were eager to follow McCarrison’s research in the expectation that it could be utilized to raise the physical condition of future generations of Indians.55 The British members of the commission, by contrast, were more concerned with his knowledge of nutritional research carried outside of the subcontinent.56 They were interested in locating McCarrison’s work within global networks of nutritional science and demarcating a niche that McCarrison could pursue. Clearly, they were intrigued by the transnational possibilities of McCarrison’s research and its implications beyond India. McCarrison made efforts to respond to the concerns of both his Indian and British interviewers. He demonstrated his awareness of nutritional research being carried out at Cambridge University, the Rowett Institute in Aberdeen, the Lister Institute in London, and at Johns Hopkins in Baltimore, USA.57 He was keen to emphasize that he had networks with

54 Ibid, p.115. In the early twentieth century Indian scientists, such as Chunilal Bose, a Chemical Professor at Calcutta Medical College, reaffirmed stereotypes about the relative physical inferiority of certain groups of Indians, such as Bengalis, which could be addressed by dietary improvements. See Jayanta Sengupta, ‘Nation on a Platter: the Culture and Politics of Food and Cuisine in Colonial Bengal’ in Modern Asian Studies vol. 44 no. 1 (2010), pp.81-98, pp.89-9.

55 Similarly, Mohandas Gandhi, although unconvinced of the necessity of milk, later followed McCarrison’s research. McCarrison’s emphasis on incorporating a high proportion of vegetables into one’s diet and warnings against the dangers of milled imported rice aligned with Gandhi’s espousal of vegetarianism and for foods to be produced using local traditional agrarian methods. Gandhi’s interest in McCarrison’s investigations stemmed largely from a desire to find a healthy national diet that would inculcate virtue into its citizens and be accessible for Indian villagers of limited means. McCarrison’s willingness to correspond with Gandhi and allow him to publish in 1929 their epistolary exchange in his newspaper Young India demonstrates that he was ready to attract the interest of Indians with nationalist sentiments, even if he was not a supporter of the Indian nationalist cause per se. See Sunil Amrith, ‘Food and Welfare in India c. 1900-1950’ in Comparative Studies in Society and History, vol. 50 no. 4 (Oct. 2008), 1010-35, 1018-1019 & Nico Slate, Gandhi’s Search for the Perfect Diet: Eating with the World in Mind (Washington: University of Washington,2019), p.41, p.135.

56 Henry Lawrence asked about McCarrison’s knowledge of nutritional research being undertaken in Europe, Japan, and the USA. See RCAI vol. 1, part 2, p.106.

Indian researchers in Madras and throughout British India, as well as his willingness to train Indian graduates.\textsuperscript{58}

The high ratio of Indians in the RCAI panel was unusual for 1920s colonial India for a committee that sought to implement policies and innovations at an all-India level. Its diversity was a marked difference to the IRFA, which had hitherto been funding McCarrison’s research, where power rested with the Director General of the Indian Medical Services of India and the Sanitary Commissioner of India, both of who were Britons, with the Scientific Advisory Body only allowed a consulting function. The significant Indian presence in the RCAI allowed for a space where, to an extent, proto-nationalist agendas could be promulgated. The interests of the Indian RCAI members thus need to be viewed alongside growing Indian nationalist criticisms of the IRFA’s biases towards supporting research institutes headed by British IMS researchers rather than offering opportunities to Indians. An emerging Indian independent medical profession, the Indian National Congress, the nationalist press and members for Indian legislative committees were increasingly advocating for science and imperial medical research carried out at research institutes to be relevant to Indians, linked to local Indian hospitals and universities, as well as offer more employment opportunities for Indian scientists.\textsuperscript{59} These demands must also be seen alongside similar demands for a greater proportion of Indians post World War I to be admitted to the upper echelons of the civil service and Indian army which were gaining momentum during this period and some reluctant concessions made by the GOI in this regard.\textsuperscript{60} Whilst unable to

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\item \textsuperscript{58} \textit{Ibid}, pp.97-8, pp.109-13.
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gain a notable presence in the IRFA at this time, it would seem Indian mobilisation on these issues was significant enough that the GOI appointed a high ratio of Indians in the RCAI panel. Yet here the Indian RCAI members were in a weak position to directly lobby for funding for Indian scientists and Indian universities. They were what Latour might term ‘weaker actants’, who could only realistically gain strength through association with stronger actants, such as McCarrison. A main component of their agenda, in this situation, was to determine if by supporting McCarrison’s interests their aspirations for developing Indian nascent science and a future generation of Indians could be pursued, albeit indirectly.

Up until the commission’s visit, the condition of livestock had not been an important consideration for McCarrison. Yet since animal stocks were a key RCAI concern, he made speculations with regard to this field when summoned again to outline his research in Madras. When providing answers to the RCAI, McCarrison emphasized linkages to other animal nutrition and plant nutrition centres within India. He argued that interdisciplinary dialogue would be beneficial, as animal and plant nutrition researchers had focused mostly on minerals present in the soil, whereas his research up to then had been predominantly vitamin focused. Indeed, he argued that he was ideally placed to collaborate with the Agricultural Research Institute in Coimbatore and the Animal Research Section at Bangalore as he was in reasonable proximity to both these locales.

61 I am using Bruno Latour’s notion that scientific networks consist of actants (which could be humans, animals or objects) that form strategic alliances with each other in order to assert agency. Latour, *The Pasteurization of France*, p.169.
62 The RCAI’s interest in livestock should be understood in the context of the famines which occurred in India in 1896/7 and 1899/1900. As well as causing the deaths of millions through starvation, they led to large-scale fodder shortages, resulting in high rates of cattle mortality. Plough cattle losses impacted upon the colonial economy as cattle were an essential cultivation tool, thereby leading to a decrease in agricultural productivity. Thus, the interest in maintaining animal stock was related to the Government of India’s desire to maintain agricultural productivity upon which the colonial economy depended. See Saurabh Mishra, ‘Cattle, Dearth, and the Colonial State: Famines and Livestock in Colonial India, 1896-1900’ in *Journal of Social History* vol. 46 no. 4 (2013), pp.989-1012.
63 *RCAI* vol. 1, part 2, p.99.
Whilst McCarrison sought to convey the potential for various collaborations, he stressed the precarious nature of his predicament. He made clear to the commission that his research was funded by a modest IRFA annual grant of 70,000 rupees, and that he was in effect only a ‘guest at the Pasteur Institute’. Thus he did not have his own autonomous institute and lacked resources. When asked if there was a suitable space in the vicinity in which he could expand, he mentioned a vacant jam factory beside the Pasteur Institute which was ‘suitable for nutritional work’. McCarrison thus came to the interview prepared with a plan of expansion.

As Latour and Woolgar argue in *Laboratory Life*, the claims of scientists are often imbricated in procuring privileges. Furthermore, they argue that scientists are ‘strategists’, and ‘the better politicians they are the better science they produce’. These insights seem apt when considering the strategies that McCarrison adopted when facing the commission. When asked questions he could not answer or had yet not shown an interest in, he was careful not to be dismissive. Instead, he responded that they were worthwhile avenues for research but would require a well-funded and expanded institute to pursue. When both Kamat and the Rajah of Parlakamedi requested that the findings should be disseminated in Indian vernaculars and the results of the research should be reproduced in simplified form in school text books, McCarrison replied that in an expanded institute there could be a publicity department responsible for popularizing the institute’s findings. Clearly McCarrison’s

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65 *Ibid*.  
69 *Ibid*, p.112. McCarrison proposal, though, was rejected in favour of keeping health propaganda outputs being controlled centrally. See letter dated 14 August 1928 from the Office of the Director of Public Health Madras to the Public Health Department in *Go. No. 861 in Public Health Local Self Government Tamil Nadu State Archives, Chennai* [henceforth PHLSG TNSA]. The Tamil Nadu Public Health Local Self Government Madras archive contains correspondence between the Madras local self-government and McCarrison, correspondence between governmental agencies regarding the
openness to enquiries was tactical in that it helped justify the expansion of his centre and additional funding.

**Expanding McCarrison’s Nutritional Research Laboratories**

The RCAI was impressed by the ways in which McCarrison promoted his research. It recommended that his institute become the central nutritional institute in India.70 Lord Linlithgow, the lead member of the commission, personally contacted the Viceroy, Lord Irwin, and conveyed the importance of McCarrison’s research, as well as directly addressed the Government of India ‘officially on the subject’.71 The Viceroy subsequently expedited proceedings by arranging for his private secretary to correspond to J. W. Bhore, a civil servant in the Department of Agriculture and Lands, who in turn passed on the RCAI’s letter to the GOI. The letter demanded ‘that immediate steps’ should be taken to secure and extend the work ‘at present being carried on at Coonoor’ and stated that the need to do this was ‘so urgent’ that the RCAI ‘have deemed it their duty to bring their views to the immediate notice of the Government of India’.72 By directly addressing the GOI, Linlithgow had suspended due process and the consultation process with relevant governmental agencies and the IRFA.

The fact that McCarrison bypassed the IRFA antagonised Samuel Rickard Christophers, the Director of the Central Research Institute, in Kasauli, and member of the nutritional research laboratories at Coonoor and the granting by various colonial governmental departments of resources and funds to McCarrison.


71 Letter dated 6 April 1927 from the Private Secretary of the Viceroy to J. W. Bhore of the Indian Civil Service in Deficiency Diseases Enquiry 1927 File number 79 in Director General India Medical Services Public Health the National Archives of India, New Delhi [henceforth DGIMS PH NAI]. The DGIMS PH records at the National Archives of India, New Delhi, contains correspondence between McCarrison and the IRFA, internal correspondence between the IRFA and its Scientific Advisory Board, and correspondence between various colonial governmental agencies regarding McCarrison’s research institute.

72 Letter dated 6 April 1927 from the Private Secretary of the Viceroy to J. W. Bhore of the Indian Civil Service in Deficiency Diseases Enquiry 1927 File number 79 in DGIMS PH NAI.
Scientific Advisory Board, which was consulted by the IRFA when it came to funding decisions. Christophers expressed his annoyance in a letter to J. D. Graham, the IRFA’s Secretary of the Governing Body, that McCarrison, who had been appointed by the IRFA, was now ‘clearly actively pursuing [sic] a policy of a Nutritional Ministry and is already a self constituted Director of Nutritional Research in India.’ Christophers added that to his knowledge no such ‘scheme for any such enormous expansion’ had ‘been ever put up for open discussion at the Research Workers meeting’. Christophers resented how McCarrison had circumvented their protocols for securing funding by autonomously courting the RCAI and the Agricultural Department of Madras. To Christophers, McCarrison was engaged in an untoward scheme to make himself the director of all-India nutritional research. Indeed, J. D. Graham further expressed his disapproval in a letter to Major General F. H. C Hutchinson, Surgeon General with the Government of Madras:

McCarrison ought to know the rules of the Association under which he works, though he expressed complete ignorance, of them to the Agricultural Commission. You mention that he has put up proposals to you for a provincial institute. I may tell you off hand that this is the first we have heard of it just as we heard nothing about his pourparlers with Parlakemedi regarding how his donation should be spent not at all events until they had been extracted from him. I do not think he quite plays the game in this respect…

Clearly, having an Indian Prince donating and McCarrison agreeing to his stipulations about how that money should be spent, antagonized Graham, as this encroached upon the IRFA’s

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73 Letter dated 10 September 1927 from Samuel Rickard Christophers, Director of the Central Research Institute in Kasauli, to J. D. Graham, Secretary of Scientific Advisor Board, Indian Research Fund Association, Simla in Deficiency Diseases Enquiry 1927 FILE number 79 in DGIMS PH NAI.
74 Letter from J. D. Graham to Major General F. H. C. Hutchinson, CIE, IMS, Surgeon General with the Government of Madras, from Simla 12 October 1927 in Deficiency Diseases Enquiry 1927 FILE number 79 in the DGIMS PH NAI.
territory. For Graham this compounded McCarrison’s original sleight of hand in courting the RCAI without informing the IRFA, which officially employed him. Later, Graham expressed ‘disapproval with a proposal’ made by the Agricultural Department of Madras on McCarrison’s behalf that he should gain control of ‘certain experimental operations connected with the growing of crops’.

The IRFA’s resentment can be understood by looking closer at its organizational structures and the criticisms it faced from the 1920s onwards. Pardey Lukis, the Director General of the IMS, had established the IRFA in order that scientific research funding would not be dependent on the GOI and especially the Indian Legislative Assemblies for approval. The IRFA favoured, in terms of distributing funding favoured central research institutes headed by British IMS officers, over supporting Indian universities. Graham had consistently resisted growing nationalist demands in the 1920s for inclusion of Indians and legislative members in the governing body of the IRFA for and greater inclusion of Indian scientists. He argued, seemingly unaware of his own ideological biases, that this was an unnecessary political intervention that threatened scientific neutrality and rigour. In this respect, the Rajah’s stipulation that his donation be reserved for research fellowships for Indian scientists would be an affront to Graham.

If the IRFA thought that McCarrison had ignored them, the Indian members of the RCAI may have felt justified in feeling betrayed when the colonial scientist turned his back on an earlier claim to them that he intended to collaborate extensively with the Indian agricultural chemist B. Viswanath based at the Agricultural Department of the Madras Government. In his replies to interviewers of the RCAI McCarrison remarked that he ‘was greatly impressed’ by the ‘magnificent work’ that Viswanath was ‘doing under very difficult

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75 Letter dated 7 March 1930 from the Director of Industries to the Secretary to Government of Madras, Development Department Go. No. 1117 1931 file in PHLSG TNSA.
76 Chakrabarti, Sign of the Times, pp.188-211.
circumstances' regarding mineral deficiencies of the soil based in Bihar and Malabar and expressed a keen interest to collaborate with the Indian scientist. Upon receiving a funding commitment from the RCAI, however, he criticized Viswanath’s research. In a letter addressed to Rudolf Anstead, the Director of the Madras Agricultural Department, he disapproved of Anstead’s proposal that his team should undertake a study to verify Viswanath’s hypothesis that chemical fertilizers, in contrast to farmyard manure, led in all circumstances to the eventual deterioration of the soil. Critiquing Viswanath’s methodology, McCarrison told Anstead that it was ‘premature’ given ‘that the observations so far made’ were ‘incomplete’ to justify him engaging in a study to verify the Indian scientist’s hypothesis. McCarrison said he was only willing to pursue this investigation ‘in exchange for’ further ‘facilities’ and a promise that the ‘manner of study be such’ as he himself ‘shall determine’. Thus, to secure RCAI funding he paid lip service to collaborating with Viswanath but when McCarrison obtained support, dispensed with the idea of working with him on anything less than entirely his terms. In this respect, McCarrison sought to suppress the agency of this Indian scientist in promulgating his own research agenda, as well as re-establish hierarchies by demanding that the Indian scientist and his research interests should be subordinate to the white British colonial researcher and his own agenda.

The colonial scientist’s strategy, though, was successful. His efforts to secure the aid of colonial authorities at both regional and national levels bore fruit. The institute changed its name to the Nutrition Research Laboratories in 1928 and acquired significant funding between the years 1928 and 35. It expanded in 1930, with the Government of Madras loaning the former buildings of the nearby jam factory to the Nutrition Research Laboratories, as McCarrison had suggested, in addition to the grounds and a house associated with the

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77 See RCAI vol. 1 part 2, p.109 & p.112
production of silk.\textsuperscript{79} The institute acquired more rooms and equipment. There were extra facilities created to house animals such as the laboratory rats and pigeons that were experimented upon, as well as more animal attendants, servants, and Indian researchers.

\textbf{Conclusion}

McCarrison’s laboratory experiments on rats were presented in a manner which aligned to the interests of the RCAI. It was, however, in McCarrison’s oral evidence presented to the RCAI where his political skills were most evident. It was here that he extended his research interests to justify expansion. He had to speak to the concerns of different audience members with different agendas, align his research to prevailing colonial interests and to demonstrate the transnational significance of his research. Yet, crucially, he had to satisfy the Indian members of the RCAI by demonstrating the networks he had formed with Indian scientists, the potential of his research institute to promote the upcoming generation of Indian scientists and the capacity of his research to strengthen the bodies of the indigenous population. An examination of the ways in which McCarrison’s Coonoor laboratories became established, thus, provides a revealing case study of how British imperial scientific research endeavours were forced to balance, at least at face value, imperial priorities and emerging nationalist sentiment. Indeed, the reputation of this colonial scientist relied heavily upon his skills to forge alliances and to bypass official bureaucratic channels when needed. Indeed, by examining McCarrison’s efforts to secure his agenda, I have offered a corrective to existing studies of colonial science that have too often seen science unproblematically serving colonial states. This micro-study of McCarrison demonstrates indicates a need to adequately take account of the idiosyncratic interests of individual colonial scientists and their own

\textsuperscript{79}Letter dated 7 March 1930 from the Director of Industries to the Secretary to Government of Madras, Development Department \textit{Go. No. 1117 1931 file in PHLSG TNSA}. 
agency within this process. This study also illuminates the ways in which Indians on
representative bodies could use their leverage to press British colonial researchers to meet, to
some extent, their concerns, creating openings for the Indianisation of science. Finally, this
study draws attention to the multiple and diverse interests within the colonial administration,
and in colonial society more broadly, which the researcher’s ‘science’ had to speak to in
order to gain traction. This study thus intends to open up a space for future scholarship with
more flexible scholarly approaches that are more able to capture the contingent and
improvisational nature of many scientific agendas in the colonies.