CHAPTER TWENTY FOUR

A THRONE BETWEEN TWO STOOLS 1927–1932

No one could take from Theiler his reputation as the leading expert on sub-tropical animal diseases and as a pioneering investigator of their bacteriological, toxic, parasitic and other causes. In a world striving for development in agricultural economy, there was no one with equal knowledge, experience and organising ability. Amery knew it. His satellite research scientists such as John Boyd Orr knew it. The Colonial Governors – Sir John Chancellor of Southern Rhodesia who visited Onderstepoort in Theiler's time, and Sir Edward Grigg of Kenya who came soon after he left – also knew it. Distantly in the Antipodes, responsible men both knew it and were taking action on a scale as grand as Amery himself. In May 1926, Stanley Bruce, Prime Minister of Australia, had introduced a Bill providing for a Council of Scientific and Industrial Research. He ensured that it operate directly under the control of the Prime Minister. Carefully he chose experts to inaugurate it – an academic professor, A. C. D. Rivett; a consulting engineer, George A. Julius; and an agricultural scientist, A. E. V. Richardson who had been to Onderstepoort and Armoedsvlakte in his preliminary survey. It was not long before they too were in pursuit of Theiler.

The old man was well aware of his value to the world at large but, baulked of a lifetime's scientific records now immured in Onderstepoort, had planned a future for himself sprung from genuine love of solving a professional problem. It had been in his mind since 1894 when, as a struggling veterinary surgeon in Johannesburg, he had crossed swords in the public Press with his competitor Hollingham on the subject of Osteoporosis – the disabling disease in horses that softened bones to the consistency of sponge. The 27-year old Theiler had then written lengthily and learnedly that 'it is hardly necessary to warn anyone with the slightest knowledge of pathology against considering every case of stiffness as ipso facto osteomalachia or osteoporosis' (which he purported successfully to treat by the administration of calcium and other 'phosphate salts'). He was aware then that mere dosing in water or solids did not necessarily fortify animal bone-structure and that the whole field of bone diseases was ill-defined and ill-understood. The problem of Rickets, Stifjziekte and other bone afflictions flittered on his periphery until the revelations of the Lamziekte investigation when he, du Toit and Green began to examine the effect of mineral deficiencies in cattle diet in respect of growth, bone formation, milk production and general health. Theiler selected as his particular future field the examination of bone structure and the determination and classifying of the various forms of bone diseases. He had collected massive equine and bovine material which he intended studying at Basle. He would be usefully and congenially occupied and du Toit would do what he could to help.

On his 60th birthday (26th March 1927), he and Emma arrived at the Foyer Suisse in London to the usual tumult of friends and colleagues. Almost immediately, Amery invited appointment and Theiler met the Colonial Secretary together with Sir Edward Grigg of Kenya in his Whitehall office. Their talk was of research into animal diseases and both Amery and Walter Elliot (whom Theiler later met) indicated that the British Government was determined to do more for scientific research in the future than it had in the past. Grigg mooted the Central African Laboratory which Walker had already described to Theiler. A very palpable straw flew past in the wind. ('The achievements of O.P. stand out as an inspiring example', Theiler later told du Toit, 'and may be emulated by some other Colony. Grigg speaks of a big laboratory for the whole of British East Africa where opportunities for research and training in Empire Veterinary Science

should be given.' It was all recorded in an official Colonial Office memorandum in most gratifying terms.)

Staring through his spectacles, Amery point blank asked him whether his services to South Africa were finally finished. Theiler said Yes. Amery asked whether they were at the disposal of the Colonial Office and Theiler again said Yes. Was he prepared to go out again into the Colonies? Theiler replied that he was prepared to go anywhere and undertake any work provided he could see that his service would be useful. Amery indicated that a proposition would be made him but not until after the Imperial Agricultural Research Conference to be held at Cambridge in October which he should attend. Theiler was delighted despite the fact that the six intervening months would be insufficient for his bone work. It was good to be wanted.

After two weeks in London, the Theilers went to Switzerland and were briefly immersed in personal and professional affairs before settling into lodgings at Basle. At the University, Arnold, ensconced in a corner of a laboratory with a lady assistant to section his bones, began his investigation and attended relevant lectures under his patron Rössle. Gratifying things continued to happen. Apologising profusely for the delay, Downie of Southern Rhodesia acknowledged Theiler's letter of January from Pretoria suggesting research, and asked for a memorandum outlining what he would require to implement his scheme. Ormsby-Gore, fired with Amery's urge to get something going, 'wrote him a very inspiring and enthusiastic letter'. Even Andrews at Weybridge wrote that 'things were now moving'. Theiler answered Downie very carefully, sending the requested memorandum but qualifying his original offer by retailing his discussions with Amery and Walter Elliot. The smart of rejection was being replaced by elation at being so much wanted.

With the best will in the world (his intention had never been firmer), Arnold had difficulty in getting on with what Emma contemptuously called 'his bones' – a matter in which, already occupied with his articles and correspondence, she became increasingly involved. Du Toit could have echoed Arnold's earlier protest against F. B. Smith's ordering him about 'as if he were still my Chief'. Theiler wrote him repeatedly, demanding more pathological material, results of experiments and, after a German tour meeting many colleagues, photographs and publications for supply to them. He regarded du Toit as an obedient accomplice in all his work. (Loyally, du Toit had found a place for Hans at Onderstepoort; but Theiler's ill-starred first-born who had meanwhile married an asthmatic German lady, had secured appointment as assistant in Comparative Pathology to Professor E. E. Tyzzer of the Harvard Medical School, Boston where he remained for several years. It was at once a solace to his father whose application to his own work now fluctuated.) Mid-summer public holidays interrupted his research and then there was Max.

When the Harvard Central African Expedition came to an end at Mombasa, Max left it to travel down the coast to South Africa. His intention was to see his sisters and to ascertain whether either the Johannesburg or Cape Town Medical Schools or Onderstepoort could offer him appointment in Tropical Medicine. None could nor, in severely depressed times, were prepared to consider prospect. Max continued his journey to Europe, enterprisingly using an aeroplane for part of the way, and arrived in Basle at the end of June 1927. Habitually since childhood, he settled down in his parents' lodgings to read, ostensibly to bring himself up-to-date, sometimes immuring himself for the whole day. Innured to his manner, they dragged him out after a week for a short tour of Germany in the company of Arnold's Boer War Swiss friend Kollmann and, soon after, a visit to Paris where Arnold bought books and equipment. Then they crossed the Channel at the behest and expense of the Empire Marketing Board.

Amery and an entourage including the Board's Gervas Huxley had left for a tour of South Africa and Rhodesia. (On the 9th September, General Smuts took them to Onderstepoort which

Amery later described in enthusiastic terms. The Colonial Secretary then carried his banner to Australia, New Zealand and Canada, promoting the Commonwealth all the way and returning to England in February 1928.) Theiler meanwhile sat in consultation in London at meetings with Lord Lovat, Ormsby-Gore, Walter Elliot, Orr, Stephen Tallents and others. With casuistic reasoning, he told du Toit he hoped his connection with colonial veterinarians in this manner would cast light on skeletal diseases; but in the meantime, the bones at Basle were being neglected. The Board had further pledged his time for a week's visit to Scotland. Emma worried about Max's still being with them. His return to Harvard was a week overdue – what would Dr Strong say? In time she learnt to accept the abstracted-scientist syndrome by which no deep-research devotee was held to account for breaches of regulation or service applicable to ordinary mortals. Max duly sailed on the *Berengaria* for New York and the Theilers went to Scotland for an arduous tour of the more usual sights in Edinburgh, the Trossachs etc and, the object of the journey, a visit to Aberdeen and the Rowett Research Institute.

Theiler who had confessed to 'the greatest disappointment' at Orr's report on Kenya during his 1926 visit to Africa ('he seems to have deficiency on the brain') was compelled to revise his view. He expressed himself 'very much impressed with the magnitude and scope of the Rowett Research Laboratory' and – further he could not go – 'experiments are made almost on as big a scale as in Onderstepoort'. Orr had all the fire and drive (and terrible temper) of the true apostle, meeting his problems headlong in open combat. Theiler tended to state his case with dispassionate dignity and to retire into sulks if it were not accepted. Both were indisputably masters in their fields and desirable to the world at large. Their brief association in Aberdeen had been exhausting and Theiler, after an unnerving Channel crossing when he and Emma were prostrate, returned to Basle tired and unsettled. He began to visit his laboratory only intermittently and to occupy himself with giving extra-mural lectures and writing articles which Emma copied. 'Pa is a restless spirit', she told the children, 'and no place pleases him for long'. He expected British Government appointment and a lengthy sojourn in London. All would be clinched at the Agricultural Conference in October. They crossed the Channel again on the 24th September 1927.

At few times in its history had 'Science' asserted itself more determinedly against 'Nature' than in the third decade of the 20th century. Einstein had propounded his theory of relativity. Rutherford was about to split the atom and countless physicists, chemists, pure mathematicians and germane brethren were working in fields hitherto unexplored. The charisma of 'Science' pervaded the whole world and its protagonists supplanted the exponents of physical feats as 'heroes' in the public mind. 'Science' was seen primarily as unlocking the secrets of the Universe but there was no lack of practical men who conceived it also as resolving the ills of humanity and securing a better life for all. It was in this atmosphere of new knowledge that the Theilers reached London and Arnold continued his service on Amery's Colonial Veterinary Service Organisation Committee with which was associated the Agricultural Colonial Service Committee, dealing with conditions of employment of vets. Also in London and active in the same ends was George Julius operating on instructions from the Prime Minister of Australia in developing the work of his new Council of Scientific and Industrial Research. Theiler, who anticipated being Britain's man, was soon aware that he might be Australia's.

The Imperial Agricultural Research Conference which opened at Cambridge two weeks later provided the ideal catalysis in the ideal setting for the ferments then current. Its president was Baron Bledisloe, Eton and Oxford, Parliamentary Secretary to the Ministry of Agriculture and with a long career of practical farming and association with agricultural organisations behind him. The conference was planned in the grand manner for a large convocation of Empire officials and scientists with their wives. It began with Cambridge University displaying its in-

stitutions and hospitality, interspersed with private parties which, for the Theilers, included twice dining with F. B. Smith at Downing College, the guests including the South African delegates – the Secretary for Agriculture G. N. Williams and the Director of Veterinary Education and Research P. J. du Toit. Talk was long and incessant. There was no idle moment and hardly a night was spent in the same bed. The Conference inspected every institution around Cambridge and then travelled north to Billingham to spend several days examining the Imperial Chemical Industries mammoth factory producing artificial fertilisers, its laboratories and various chemical processes. Emma trooped with the rest and confessed to understanding 'herzlich wenig' (jolly little). Thence to Scotland and innumerable agricultural colleges and research stations and finally back to London for the Conference's concluding stages. By then, Emma knew that Arnold had been prevailed upon by the Australian delegates, particularly A. E. V. Richardson who later
19 admitted to having originated the proposal. 'It is possible', she wrote on the 22nd October 'that Pa and I will leave for Australia for about 6 months at the beginning of 1928'.

Theiler who had caught the eye of Bledisloe (destined soon to become Governor-General of New Zealand), had enhanced his father-figure and become an indispensable consultant in the general drive toward improved agricultural production. The Conference itself made many recommendations relating to the inter-change of publications, research workers, etc and, of particular reference to South Africa, recommended the institution of a chain of research stations throughout the Empire. More specifically, the Union Government was to be asked to increase the facilities at Onderstepoort to enable it to undertake the functions of a Central Research Station in animal diseases. Theiler had seen to it that his cherished Institute should come into its own. The Empire Marketing Board immediately opened negotiations with Williams and du Toit while Theiler in London continued in consultation with Amery's committees on the conditions of veterinary training and service in the Empire. He also spent time in Australia House in discussion with F. L. Mcdougall of the staff, George Julius of the C.S.I.R. and John Boyd Orr.
20 Julius was a notable negotiator and, once committed to Stanley Bruce's vision of the application of academic science to agriculture and industry, bent his best efforts on eliminating local antagonisms and securing overseas experts to set the scheme on its way. He had been instructed to obtain the services of Theiler and Orr to examine the Australian stock-raising industry with Theiler reporting on the organisation of the veterinary service.

Julius put a plausible case. He offered Theiler £1,000 in cash for a six-month tour early in 1928 with all expenses paid for himself and Emma. It was now obvious to Theiler that Amery's great schemes were still in their formative stage and that the Empire Marketing Board had yet to get into its stride. He was continually needed for advice on an ad hoc basis but the emerging structure as yet held no position for him. Williams and du Toit had pointedly distanced themselves, evidently occupied with seeking their Government's consent to the implications not of use of Theiler but of Onderstepoort. He had no tie there and accordingly he accepted Julius' proposal. Cables were sent to the Commonwealth Government requesting formal confirmation.

The month-long Conference at last came to an end with a full-dress reception at the Imperial Institute (where the Theilers met Sellards of Harvard, then on his way to Lagos to investigate Yellow Fever, who gave them cheering news of Hans and Max), 'a very swanky lunch' at the Savoy Hotel and final visits to laboratories. On their last night in London, the Theilers had Harry Green to dinner. He had been most of the time on leave in Glasgow where he had rashly accepted appointment without thought of the consequences and was now returning to South Africa with Williams and du Toit (who, no longer feeling obliged to pay his respects to his old chief, made his adieux vicariously through Green – Emma took it badly). By the time they left
21 London on the 1st November, their future had been further complicated by a commission from Amery's office, all expenses paid, to utilise their voyage to Australia to visit Ceylon for Theiler

22 to report on local veterinary research. Orr with his wife was already similarly involved in a nutritional survey of Egypt, Palestine, India and Ceylon where he would meet Theiler and sail by the same ship to Melbourne.

The bone business would have to wait. In only three days in Basle, the Theilers read their accumulated letters and journals and packed for further travels. The news of Arnold's complicity in the Colonial Office's grand planning had been noised abroad together with the announcement that the Societé de Pathologie Exotique in Paris had made the first award of its gold medal honouring Laveran to him. It was perhaps his highest professional honour yet and he would go
23 to Paris to receive it. Meanwhile his friends wrote to congratulate him on appointment to the British Service, mistaking his retention as adviser for permanent employment.

Within the week, the Theilers were in Rome where Pa attended an International Veterinary Conference and Emma diverted herself in the Borghese Gardens, gallery and Zoo ('not as many animals as in Pretoria'). As the Conference ended, Mcdougall of Australia House formally confirmed his Government's invitation in the terms discussed. The Theilers were then in Milan on
24 their way to Turin to see Frank Veglia who, leaving Onderstepoort in May 1927 after a 15-year association, was now a professor at the local University. When they reached Basle a few days later it was only to leave immediately for London on the invitation of the Colonial Office. Pa felt important but the going was hard. There seemed no end to constantly crossing the Channel.

The Colonial Office through its Research and Service Committees and the Empire Marketing Board (energetically organised by Stephen Tallents) were making the fullest use of his services in a wide variety of projects, organisational as well as scientific. When they came to fruition, there would surely be high place for him. Consultations sometimes took only two or three days. Within a week, the Theilers were back in Switzerland, spending the weekend at Zurich with Kupfer (longing in the bitter winter to be back at Besterput despite the dust and the heat and the loneliness), the failing Professor Zschokke, the venerable Professor Carl Schröter and Dr Albert Heim who aroused the old longing for Africa with fine colour pictures taken on the Mittelholzer flight. Back in Basle, letters demanded more consultations. Dr Rivett, director of the Australian C.S.I.R., wanted Theiler to concern himself with a particular disease of sheep. Australia House had outlined his itinerary. Tallents had received from Kenya's Sir Edward Grigg Theiler's memorandum to Downie on East Coast Fever with comments by local veterinarians. Grigg suggested close coöperation on the subject between Kenya, Southern Rhodesia and South Africa. Tallents asked Theiler to call to discuss it and other points. Within 10 days of their return, they were in London again. Theiler agreed to prepare a memorandum on Empire Research into East Coast Fever. The emissary from Australia House came to the Colonial Office to finalise his itinerary. Three days later, they were on their way to Paris. The old man throve on the busyness and importance but began to long for a home and a settled life.

The French did him great honour. He attended a luncheon given by the luminaries of the Institut Pasteur and in the late afternoon, the annual meeting of the Societé de Pathologie Exotique. At its conclusion, the Laveran medal was formally presented to him with generous eulogia and he gave his address in French on 'L'Aphosphorose chez le betail sudafricain'. Emma joined him in the evening at the main conference of the Societé de la Science Coloniale where he was presented to the French President Doumergue and the Minister of Agriculture Perrier. The next day, they were back in their lodgings at Basle.

Theiler was still determined to finish his 'bone work' before he left for Australia in March 1928. Ten weeks remained and, deeply offending Alfred, his family and friends by refusing to attend Christmas festivities, he intended completing his observations after dealing with accumu-
25 lated correspondence and commissions including the memorandum for Tallents on Colonial coöperation in combatting East Coast Fever. His connections at Onderstepoort wrote him con-

Lady Theiler – a portrait study made in New York in 1934.

Man of Distinction – Sir Arnold Theiler in London in 1934.

The Sculptor, *Coert Steynberg* modelling in clay the bust of Theiler in London in June/July 1934.

The completed bust, an excellent likeness, later cast in bronze.

tinuously. King had left Agriculture through force of circumstances and transferred to Education, now working in Cape Town where he had met Harry Green disembarking from England. Green was in two minds about his future – fearful of losing his pension at O.P. if he left for Glasgow where he had accepted appointment and basically wishing to remain in South Africa.
26 King correctly forecast that he would remain. The Governor-General was continuing his visits to Onderstepoort and had brought Lord Allenby. Princess Alice called with undiminished en-
27 thusiasm, bringing in January her cousin Princess Helena Victoria (Thora) who had scandalised Orenstein on the ship coming out by reclining in a deck-chair in knee-high skirts, smoking furiously and wondering what her grandmother Queen Victoria would have thought about it. Times were changing but the Empire was riding forward on a wave of energy and innovation greatly stimulated by the Empire Marketing Board. In London, Amery approved pioneering publicity schemes involving every kind of publication (books, pamphlets, posters), film productions (marking the birth of the documentary), exhibitions and other devices intended to initiate Empire-consciousness in the general public. Even for Theiler, it was 'Heaven to be alive' in a nascent new world.

He was steadfast in his aim to complete his comparative study of the influences on bone
28 structure. Emma resented the money he spent on his laboratory and assistants, his books and journeys to consult bone pathologists when in other matters, he was downright parsimonious. Over the New Year in freezing cold, they went to Dresden to consult the most famous German expert, Schmarl who was most enlightening and inspired Theiler anew. Three weeks later, he consulted him again. In January, he was due in London for another meeting of the Colonial Office Service Organisation Committee but it was postponed and he was able to continue his bone work until the 23rd when he crossed the Channel again for a brief visit. The results of his
29 microscopic investigation, he told du Toit, were 'startling'. Rössle wanted him to report them for publication but he had no time. He had found that Rickets in young animals was simply Aphosphorosis or due to deprivation of phosphates. He wanted du Toit to send him the results of the O.P. experiments on Aphosphorosis in foals. With no time on hand, it was insufferably frustrating.

On the 23rd February, a telegram came summoning him to London yet again, a bare two weeks before leaving for Australia. The great Colonial proposals hung in the air – a Tropical Veterinary School in London, a Central Research Laboratory in East Africa, an extension of the Bureau of Animal Health at Weybridge, a concert of Commonwealth effort on some undefined basis. But Emma, always with him (and busy buying formal apparel including a pearl necklace in London for their overseas visits) was peeved at all the talk and no propositions for Arnold. Fundamentally a realist of shrewd Swiss judgement, she complained to the children that they heard of no decisions, only rumours. Meanwhile, lunching with Mcdougall at the British Empire Club in St James Square, Arnold heard the final details of his Australian tour which Professor H. A. Woodruff of the Faculty of Veterinary Science at Melbourne University had arranged for him at the behest of Rivett of the C.S.I.R. Always anxious to brief himself beforehand, Arnold had asked for a book on Australian flora. All he got was a general handbook, the only copy in Australia House. Amery's great publicity drive had not yet struck the Antipodes.

They sailed from Naples on the 11th March 1928 on *S.S. Orama*, a bigger and more comfortable ship than any in their experience, and prepared to relax as far as it was possible for either. Arnold had bought a new toy, a cine-camera and books on learning Italian which he was determined to master on the voyage. The ship held only a third of its capacity for passengers and, progressing down the Red Sea into the Indian Ocean, gave the tired couple a chance to recover.

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Theiler was now a portly imposing figure, clean-shaven but for a neatly-trimmed moustache, and with his hair, grey at the temples, cut en brosse. He enjoyed returning to the tropical whites of his Transvaal days and, refreshed by the voyage, disembarked at Colombo to meet his colleagues and inspect their Ceylon Veterinary College. Confirming his forecast to du Toit, he derived valuable information on mineral deficiency in bovines and in due course, the resident veterinarians, Sturgess and Crawford, sent bone material to him in Switzerland. Orr and his wife, exhausted and depressed by the malnutrition and 'abysmal poverty' they had seen in Egypt, Palestine and India, came aboard from their last assignment at Madras and gladly met the Theilers. They had much in common and the voyage to Australia was very pleasant, no one being bored, Arnold noted appreciatively. They expected to arrive fighting fit at Melbourne, unsuspecting of royal welcome until Theiler received a radiogram at sea advising that he would be met at Freemantle.

Australia, despite the publicity deriving from its services during the Great War, was still very much 'the outback' attainable only by lengthy voyages (there were no transcontinental air services) and generally known as a huge and largely desolate area producing sheep where not populated by kangaroos, dingo dogs, emus and rabbits. Arnold had 'read up' as much as he could but was unprepared for the lavish attention and veneration shown him while Emma was confounded by the cultural differences which isolation imposed. At Freemantle, members of the local Veterinary Medical Association came aboard and took them to lunch with University professors and Agricultural officials. At Adelaide, they were met by A. E. V. Richardson of the Waite Agricultural Research Institute which they visited. Richardson made no secret of his designs on Theiler. On the 9th April they arrived in Melbourne where the C.S.I.R. secretary Lightfoot installed them temporarily in an hotel before moving them to official quarters. On the following night the Prime Minister himself presided at an official welcoming dinner whose guests represented the University and the C.S.I.R. Bruce and his wife were exceptionally amiable (Bruce had great hopes for the wand Theiler would wave) in the pronouncedly informal manner of his country where 'everything free and easy' astounded the withdrawn and conservative Emma.

Then it was work. The Orrs were carried off on a specialised six-week tour and Theiler was rushed about in a manner totally disregardful of his age and eminence. Always keenly interested, looking for material that might support his working hypotheses and observant of divergences from his own and world-wide practices, he could well blame himself. At no time did he call a halt in an itinerary that would have felled a younger man. Emma, plagued by colds and tonsillitis and much discomfitted by primitive train travel (1,000 miles without a dining-car – only snatched meals at stations) was with him throughout and, as always, acted as amanuensis. Australia did not commend itself to her. She had difficulty in understanding the people 'whose speech was worse than the commonest Cockney' and learning a new vocabulary. A man with more than 1,000 sheep was not a sheep farmer but a 'pasturalist' and a cattle farmer was a 'grazier'. Culture was of no account and Europe was very very remote. Arnold liked the Australians and, ever responsive to challenge, was interested in their problems. From the outset, he knew that they intended employing him to solve them. So did Amery, not for a single country but for the whole Empire. The dilemma declared itself and the participants early took sides. Emma emphatically inclined toward the Colonial Office, Arnold toward Australia – with his usual conditions, now including employment for both daughters. Neither choice had yet come to the point but Arnold wrote to Margaret and Gertrud while Emma silently besought Amery to show his hand.

Theiler recorded every detail of his exhausting seven months travelling through Australia – every place he visited, every official and farmer he interrogated, every condition he found, every

postmortem made at his behest. His coming had been well prepared and he was saluted wherever he went – by his professional colleagues (in New South Wales, he encountered Major C. J. Sanderson, Veterinary Officer in charge of Tick Eradication, who had used the Daspoort Laboratory as sick lines for his horses in 1900 in temporary authority over Theiler before George Turner came – racy reminiscences abounded); by learned bodies such as the Royal Society of Tasmania to which he delivered lectures; by the vice-regal authorities everywhere (Lady de Chair, wife of the Governor of New South Wales, Sir Dudley de Chair, wrote Emma specially about her garden party – she was Enid, daughter of Harry Struben of the pioneering Pretoria family whom Arnold had known in the early days as an enlightened Transvaal farmer); by University authorities and Government officials and by farmers at every level from the impoverished drought-stricken pasturalists in the north to opulent owners running 50,000 sheep on huge estates and, in one instance, amazing Emma with a beautiful house, six servants, chauffeur and gardener. While the Australians spared him nothing in a 20,000 mile survey, they treated him like royalty throughout and engaged his best efforts. Slowly there crystallised in his mind the proposal to found an Empire Central Research Station, a second Onderstepoort, at Canberra of which it were foregone that he would be Director. Nothing could be settled until he discussed it with Amery.

Orr returned to Melbourne in May and joined Theiler in discussions with C.S.I.R. officials. He had no interest in future prospect, being content with directing the Rowett Research Institute and other avenues of self-expression; but, like Theiler, was determined to promote inter-Dominion coöperation in research. On the invitation of the New Zealand Government, Orr and his wife sailed for Wellington in a ramshackle ship as a Seamen's Strike paralysed normal facilities and were lucky to reach it alive after severe storms. Similarly invited, Theiler was prevented by a further strike from reaching New Zealand but suffered dreadfully with Emma in a storm-ridden crossing to Tasmania.

He remained in communication with du Toit (to whom he referred countless demands for Onderstepoort publications, pathological specimens and other material for his Australian friends) and was distressed to note in a delayed letter from him that Harry Green appeared to be losing his reason. Green with his keen perception and over-conscientious temperament, had been a cardinal collaborator in some of Theiler's most important work. Now he suffered overpowering delusions of inefficiency and inaccuracy in his conclusions, rendering him useless as a scientific worker. Du Toit indicated that his mental state was deteriorating and Theiler replied that he was sorry that he could not see him as he felt that he could help him. There was a close bond between them founded on Green's exceptional meticulousness and reliability.

From the States had come exciting news. Sellards of the Harvard Medical School, returning from West Africa with Yellow Fever material, had met Max in New York and offered him the opportunity of working on it. Max had gladly accepted and his Harvard superior, Dr Strong, had given a champagne dinner to the staff to celebrate his advancement. The lethal nature of the disease was familiar to all of them but unbeknown to the celebrants at that moment was its latest victim, a co-worker and friend. Noguchi who had been working at the British Medical Research Institute at Accra as a guest-scientist from the Rockefeller Institute, left on his return to New York on the 19th May 1928, having injected himself with Yellow Fever from Indian monkeys to which he thought himself immune. Two days later, he died on the ship. Theiler first heard of it in Sydney in June and Emma, exhilarated by Max's enthusiastic letter, became fearful that even if his experimental animals were not monkeys, he might be infected by the mosquitoes with which he worked. There was now another to share her concern – Max had married an American girl, Lillian Graham, unbeknown to his parents, and was soon contemplating fatherhood.

On the long tour of Queensland and beyond, Theiler noted many familiar problems – toxic plants, mineral deficiencies, various forms of botulism, tick-borne diseases and, in an area deep in four years' drought, malnutrition and despair. Rinderpest had vanished and Scab in sheep had been eradicated but curiously, Trypanblue had not proved a specific against Redwater as in South Africa. Theiler surmised that the Australians were administering an ineffective type. The meetings of pasturalists convened for his benefit showed pathetic faith in his ability to wreak miracles and banish their troubles. Instead of informing him, they asked his advice, poignant in
38 the presence of prolonged drought. 'People came from long distances to hear what I had to say and expected to leave with information which, as a matter of fact, I was unable to give', he said. It was not one of his functions but it added to his argument that a Research Institute should not interfere with the work of extension and administrative veterinary officers.

39 Concluding his Queensland tour, he met the stocky little Sir John Russell, director of the Rothamstead Agricultural Experimental Station in England who many years before, had contemplated joining F. B. Smith's staff in Pretoria as a chemist. They travelled together from Brisbane to Sydney, comparing notes and confidences. (Russell in his eighties recorded the impression that Theiler 'was dropped from the agricultural service in South Africa' owing to a policy of employing only Afrikaner nationalists. 'When I met him and his wife in Australia, he was still sad at having to leave.') Together they attended an Executive meeting of the C.S.I.R.. Bruce was making use of every available expert to further his plans. Theiler was then escorted by George Julius, A. E. V. Richardson and Dr A. C. D. Rivett to Canberra to inspect the site chosen for the proposed Institute. He was much impressed but, worthy of his hire, raised problems of proximity of infectious diseases, disposal of carcases and other disengaging features for the
40 nascent capital. He had now definitely been offered appointment as its Director but had neither declined nor made conditions, deciding first to go to London to see whether the Colonial Office offered a better proposition.

Then it was time to make the horrid crossing to Tasmania – 'the land of the wattles', Emma
41 wrote, dutifully bouncing in motor cars throughout the island. Theiler was delighted to spend an afternoon with a farmer Broadribb who, years before, had consulted him by letter about a parasitic infection in his sheep. He had applied Theiler's advice 'with complete success to his flock' – a shining instance of Commonwealth coöperation. The relentless pace and comprehensiveness of their journeys were telling on the old man. At the end of exhausting days, he was drained of vigour and went straight to bed. Emma watched him carefully. He had been affected
42 by the deaths of Stockman, Leischman the Scots bacteriologist, even his own Secretary for Agriculture, P. J. du Toit. Now there was Noguchi and soon after, young Kehoe. From Pretoria, he heard constantly of Green's mental collapse. Protesting that all his work was faulty and his results fabricated, Green would talk to no one but du Toit and a subordinate Graf. Neither could convince him that he was deluded nor in any way restore his self-confidence. He refused to
43 work and his wife, detecting him burying phials of cyanide in the garden for future suicide, confided in Orenstein who recommended treatment at a specialised hospital in England. The corruption of his friend's mind saddened Theiler who hopefully sent messages via du Toit. More he could not do until his contracted survey were completed.

There remained South and Western Australia, beginning with a detailed examination of Richardson's Waite Agricultural Research Station at Adelaide. Richardson and his C.S.I.R. colleagues applied increasing pressure to induce Theiler to accept appointment. They assured him that he might employ Green as his bio-chemist and Gertrud as parasitologist; but Emma cannily noted that conditions were hard – only 14 days annual leave, no overseas sabbaticals, no chance to go to Europe. The assault continued during the last stages of their tour and with it, the tragic problem of Green. On the 15th September in Perth, Theiler received a cable from Mrs

Green – 'Harry still very ill – can you possibly return via Pretoria – cable reply'. Much though she wanted to see New Zealand, Emma thought he should go – if Harry really were his friend. Du
44 Toit confirmed the situation – Green had been absent from work on full pay for 8 months and the doctors had pronounced his case hopeless. He wished Theiler were nearer 'owing to the great influence which you always had over him'.

Except in his appointed task – his own refuge from vacillation – the old man's mind was a tumult of indecision. Emma had forthrightly declared her dislike of Australia's isolation from the world as she knew it and expressed the hope that the Colonial Office would have something for Arnold that would keep him far from the Antipodes. The girls had shown no inclination to uproot their careers for a raw and unknown land. Back in Melbourne after the final tour of the west, Theiler sustained further assault. He was offered appointment as Director of the new Research Institute (on which he had not even begun to prepare his report) at £2,000 a year with house allowance. He might employ Gertrud at £500 a year as parasitologist and Margaret at £400 as private secretary. He might also employ the bio-chemist H. H. Green as assistant. Emma set her face against it. She hated Australia. Pa might find the work congenial but he would soon mind being banished from his overseas colleagues. The Colonial Office was the only hope. There was also Green to be saved and 'his head put back'.

Theiler's original plan had been to visit New Zealand and return to Europe across the Pacific, seeing Hans and Max with his new wife in the United States en route. He abandoned it because of Green (whose wife now qualified her cable with a written cri du coeur and the hardening determination to take him to England since he did no work at all and showed no improvement). Arnold now intended returning to South Africa after a trip to New Zealand but a Seamen's Strike prevented the excursion and he booked directly to Durban. He had less than a month in which to complete his report (between the 25th September and the 23rd October when due to embark on *Ceramic*) and was constantly between two fires. The Colonial Office had expected him back at the end of September.

Emma ceaselessly promoted his prospects there. She would rather go to East Africa, she said, than return to Australia. The C.S.I.R. summoned him to Sydney for further meetings, adding to
45 its blandishments. He could make his own terms but Theiler still havered – 'I have so far only indicated the possibility of my accepting the appointment and outlined the eventual conditions which they would accept in toto', he told Alfred, 'I have however postponed my decision until
46 my arrival in London.' Australia had given him much. 'I have received the hospitality of a prince, at times almost embarrassing and I have learned to like the Australians.' They had offered a challenge and captured his interest in its grand solution. He had traversed their vast and varied agricultural regions both as observer and as pupil. He had made a special study of wool-culture which he found captivating in research possibilities. Responding to his enthu-
47 siasm in addresses and personal interviews, the National Council of Wool-Selling Brokers of Australia had started a fund with a target of £100,000 to help him found the Research Institute he envisaged. It remained now to record his observations and make his recommendations.

48 Merely to look at the Table of Contents of Theiler's 46-page 'The Health and Nutrition of Animals' (Orr added an 11-page discursive account of his short tour) at once indicates the phenomenal orderliness of Theiler's mind and his capacity to marshal a diffuse mass of facts into a coherent constructive plan. Simple, terse and direct, he surveyed the Australian stock-raising scene with the wide eyes of a topical Empire-addict. The climate of his times was assertively Empire-orientated. Australia under Bruce wished to join the coöperative conglomerate with its manifest advantages. Theiler saw it as having its own claims and likely to confer benisons on its brethren. Stock diseases were generally common to most of them but in Australia, ex-

perimental animals were cheaper and research could be more economical. The C.S.I.R. should draw the fact to the attention of the Empire Marketing Board.

The main recommendations were made in the grand manner of the senior statesman wisely considering the facts of the present in relation to the aspirations of the future. He proposed dealing
49 positively with animal health as a whole. 'The Institute at Onderstepoort, South Africa which was founded and organised by me did not deal with all the aspects of animal health as I propose should be done in Australia. It dealt almost exclusively with disease. It is true that the activities were somewhat different inasmuch as they included services to farmers by correspndence; demonstration trains; the supply of serums, vaccines and drugs; testing dip materials; routine diagnosis; etc. There was attached to the Institute a Veterinary Faculty. It was carried on almost as a sideline to the research work. All these activities were a gradual development resulting from the research portion of the staff. Onderstepoort had the advantage of plenty of cheap labour and much of the routine work was done by trained lay assistants, leaving to the qualified staff the supervision and ample time for research. In comparing thus the two organisations, Onderstepoort was a much bigger one for a limited number of subjects. Yet the stock population of South Africa is much smaller than that of Australia. There are 30,000,000 sheep and 9,000,000 head of cattle in the former to 100,000,000 sheep and 22,000,000 cattle in the latter. The Institute at Onderstepoort was the result of a gradual development, beginning very moderately and finishing magnificently. It could not be foreseen to what the first enterprise would lead and its evolution was subsequently a natural one. Having had all that experience, I have applied it to the problems of Australia and have made a forecast of what I see will be the Institution of the Commonwealth (of Australia) when it is allowed a natural growth.'

He proposed the progressive development of a Main Laboratory for pure research at Canberra and of the existing veterinary institutions elsewhere for local requirements. 'My ex-
50 perience has taught me', he stated, 'that the more boldly a problem is attacked, the sooner it yields to the effort.' Its primary premise was the appointment of a Chief of a Division of Animal Health. Pending his assumption of duty, the local sub-stations could be developed. He begged the C.S.I.R. to recognise that Australia's main industries were based on the health of animals. Their care should be its first concern. 'Animal health', he wrote tritely, 'is national wealth.'

The text of his Report was in the Committee's hands before he left. In Melbourne to embark, he again met its members. Heavy pressure was renewed. For so visionary a scheme, only Theiler himself, originator of a famous analogue, could be responsible. 'The people here', Emma wrote
51 her children laconically, 'want to have Pa back.' He would give no immediate answer. The Report, ostensibly confidential and considered of the highest importance, was rushed to the Government Printer. Copies reached Australia House in London in February 1929 and twelve were sent to Theiler at his Basle address. The siege continued.

* * *

S.S. Ceramic left Melbourne on the 23rd October on the long voyage to South Africa. Burdened by the mass of papers Arnold had collected, the Theilers relaxed in utter exhaustion. 'They sat
52 side by side on the deck for hours on end', a fellow passenger recorded,' neither reading nor talking to passengers and resisting attempts to break the ice'; but on the 26-day journey, they recovered and landed in Durban on the 18th November in good order and, in Arnold's case, fighting fit. A welcoming telegram and two letters from du Toit awaited him, both regretting that he would be away from Onderstepoort on leave at East London until the 8th December and confirming that Green's condition was unchanged. The South African Press awaited him too.

Theiler made some provocative statements dear to the hearts of newspapermen. He said that

Stanley Bruce had asked him to become Director of Research in Animal Health to the Commonwealth of Australia but that he had not yet given his decision owing to his obligations to the British Government. Bitterness welled up within him and he recalled how Kemp had enforced his retirement 'to make way for a younger man'. He had been prevented from continuing his
53 research work and even from completing his Reports. 'I have never made provision as many civil servants do, by acquiring a farm to which I could retire so I decided to go to Europe to finish some of my research. But, having no access to the records which I had carefully accumulated for many years, I had no opportunity of completing a work which had been the aim of my life – to give to the veterinary profession and South African farmers a treatise on animal diseases of South Africa so I had to abandon the idea.' (It was in fact then being compiled from his own records by one of his pristine staff, M. W. Henning.)

54 This was manna for disgruntled editors. The Johannesburg *Star* in a leader pointed out that 'Sir Arnold Theiler is one of the two or three scientists who have made an international reputation entirely by work carried out in South Africa', that Australia had voted vast sums for research and had had the wit to consult and possibly employ him while South Africa had thrown him away at the height of his mental vigour and deprived him of his records. It was too much for Kemp. While Theiler dallied for a day in Pietermaritzburg meeting old colleagues on his way to
55 Johannesburg, Kemp in Pretoria issued an official statement to the Press. Theiler, he proclaimed, had been generously treated with a £3,000 bonus, paid sabbaticals, and pension and leave concessions. He had never asked for access to his records. Equally combative, Theiler replied from
56 Johannesburg where he had put up, a stranger, in the Carlton Hotel. He stated at length that he owed the Government for no favours and was 'ready to say more if necessary'. *The Star* returned
57 to the charge that he had been jettisoned 'in his intellectual prime'. It was no atmosphere in which to effect reconciliation or to render easy Theiler's enforced visit to Pretoria (to sell his furniture and make other final arrangements) and to Onderstepoort in the absence of du Toit.

Planning a two-week holiday at the Cape with Margaret and Gertrud before embarking for England to make their crucial decision, Arnold and Emma spent a week in Pretoria settling
58 their affairs. (Theiler made a point of calling on General Smuts now, in opposition, devoting increased time to botanising and studying the Natural Sciences.) Rivett of the Australian C.S.I.R.
59 cabled Theiler in Pretoria for advice about a staff appointment and he replied as if already attach-
60 ed. He made several visits to Onderstepoort to see the irremediable Green and to tell Gilles de Kock, Alexander, Bisschop, Hinds and others of the fascinating aspects of his Australian journey
61 which they duly retailed to du Toit when he returned. Mrs Green had accepted Orenstein's advice to return to England and later made arrangements for committing her suicidal husband to the Maudsley Hospital in London. They would travel on the same ship as the Theilers and perhaps, in a change of scene, Arnold would at length prevail upon Harry, sunk in clinical melancholia.

The voyage, otherwise successful, was marred by Green's distressing condition. Theiler could do little with him. He oscillated between normality and periods of deep delusion in which he mistrusted all his work and remained locked in his cabin. His wife stood valiantly by him but Emma found it hard. Landing in England in bitter cold, he was taken quietly away by his two brothers-in-law to Cardiff. The Theilers, already victims of vicious winter weather, went straight to London where Arnold's 'chronic bronchitis' and rheumatism in his right shoulder almost incapacitated him. He managed to go to the Colonial Office to discuss his affairs and, meeting Ormsby-Gore, was advised to accept the Australian offer. Amery evidently had no position
62 ready for him. He had fervently and secretly hoped to be appointed Veterinary Adviser to the Colonial Office. He felt too ill to deal conclusively with Australia House and Mcdougall did not
63 press him for an answer, offering to come to Basle when he felt better.

In fact he was beset by indecision, hoping always that Amery would want him. Concertedly
64 Emma, Margaret and Gertrud had set their faces against Australia though Emma conceded that they could save money there. Emma, since her early days in England as governess/companion, was English-orientated. So was Arnold since the Boer War when the British had treated him handsomely. But Australia was a challenge and a recognition of his capacity to meet it. The Gordian knot could be cut by his physician.

On the 16th January 1929, Theiler was thoroughly examined by Professor Stähelin in Basle and 'Röntgen-rayed' the next day. There was nothing fundamentally wrong with him – no trace of pleurisy in the lungs, the heart sound, a touch of arthritis in the right shoulder which would respond to hydro-therapy, a slight deafness in the left ear. Stähelin pronounced that there was ab-
65 solutely no reason why he should not accept any appointment including Australia. Desperately
66 on the night of the 17th Theiler wrote to the Empire Marketing Board, formally reporting his return, describing his investigations and the forthcoming publication of his Australian report.
67 Tallents replied immediately and non-committally – 'I am sorry to hear that you were under doctors' orders while in London and I hope we may meet when you are next over here.' There
68 was no way out. Emma was iller than he and coughed alarmingly. 'Pa is becoming a bore', she complained, 'He still doesn't know what he wants to do or rather, he doesn't want to say.'

Rivett wrote to Theiler, 'quite impatient to know what the decision is to be after your discussion with Mr Amery' and, unable to contain himself, cabled Mcdougall before the letter could arrive. Theiler, in reply to request, detailed his physical state for the pleasure of Mcdoug-
69 all's riposting – 'the periarthritis and the lesions of chronic pleurisy would respond quite won-
70 derfully to the Australian climate'. Orr, younger than Theiler by 13 years and much impressed by his scientific ability and dedication, was now invoked to force the issue while Rivett continued cabling 'great anxiety about Theiler's decision'. Coughing and sneezing in extremely cold weather, hating 'hydro-therapeutic treatment' which did his rheumatism no good, the old man's
71 mind was further distracted by a cable announcing the birth on the 7th February of his first grandchild – a son to Max and Lillian who would be called Arnold Theiler, 'Noldi' for short.
72 Orr and Mcdougall, deferring to the frigid weather, his ill-health and the pressure from Australia announced that they would arrive in Basle on the 16th February. He was cornered.

Over a long weekend during which the Theilers entertained the persuasive and distinguished delegation, the old man haggled desperately – his age, his health, his own work, his need for a specialised assistant now that Harry Green was unavailable, his fee, his travelling expenses, his
73 lack of topical literature. He was overborne. Without waiting to return to London, Mcdougall cabled Rivett from Basle – 'Theiler definitely unable accept post offered owing desire undivided research, age and health. Theiler Orr agree Australian policy animal health should for some years be attack immediate problems with improvised field laboratories in two forms in Queensland and Southern Australia. They suggest Central Laboratory be deferred pending field operations and availability director. If Australia prepared to accept plan of immediate attack, Theiler prepared favourably to consider coming to Australia in July for one year to act as adviser to the scheme. Orr is prepared to supply a bio-chemist and to make Rowett laboratories available. Both urge plan of immediate attack for sound scientific and economic reasons. Am sending memorandum agreed by Theiler and Orr within two weeks.'

74 Rivett, considering half a loaf better than no bread, cabled immediately that though disappointed, he agreed to the one-year arrangement on the previous basis of £2,000 a year, rent allowance of £300 in lieu of a house and transport exclusive of Lady Theiler. Arnold made his own conditions – the journey must be via the United States (so that he could see his grandchild)
75 and an allowance of £50 to buy literature for the C.S.I.R. He openly doubted whether one year
76 only 'will do any good'. To Alfred he confided that there seemed 'no way out and we have al-

ready begun enquiries about the journey'. He wanted to return to his bones. Emma told the children that he was going 'very unwillingly and would much rather stay here'. They enquired tentatively about ships and Theiler (still plagued by his shoulder and Emma by her cough), between lecturing various bodies only too glad to hear the great man, fitfully worked in his laboratory whose female assistant he had hoped to take to Australia. Rivett had written with disappointment but sympathetically – he understood that Theiler had accepted only one year's appointment because of his health, his daughters' refusal to live in Australia and the inability of Green to be his second-in-command. George Julius (now knighted) had obtained Ministerial confirmation of the new arrangement. Macdougall reported from London that 'every letter and cable I receive from Dr Rivett shows how keenly Australia is looking forward to your visit'.

The old man agonised over his decision. Bisschop on study-leave came to remind him of Onderstepoort and the happy days and to be helped as always by his 'old chief'. The bone work could never be completed before he left. He proposed travelling on *Ormonde* leaving for Australia on the 25th May. It was now too late to go to the United States and Margaret, arriving in the middle of April at Basle, would have to go alone. Sellards who had shared his work on Yellow Fever with Cowdry and Max (Cowdry kept in communication with Theiler, writing him at Basle), now left the whole problem to Max with, his parents later heard, disastrous results. Max caught the deadly disease and survived to become immunised.

The net was closing. Australia required Theiler to select various instruments in Germany and to go to Bradford in England to inspect woolspinning machinery. Orr wanted to see him in London. Theiler agreed to a meeting on the 23rd April if his expenses were paid and cancelled the arrangement three days later. He offered the view that there would be difficulties in Australia in employing an English bio-chemist. Mcdougall discounted it and Orr confirmed obtaining a candidate. April was reaching its end and Theiler was compelled to ask Macdougall to make 'a provisional booking' on *Ormonde* for the 25th May. All the books and papers were already packed and his temper worsened. 'Pa complains that the Spring weather affects his shoulder and is in a bad mood because he cannot complete his beloved bone work and must now pack it all up. He has found an entirely new field of research and', wrote Emma presciently, 'if it ever comes to publication, will cause a sensation.' Only a deus ex machina could save him now. Stähelin provided it.

A month before his intended departure, Theiler consulted the professor on the state of his health. The prognosis was against his new occupation. He no longer had the constitution of a strong man, Stähelin said, and he had a kidney defect which required attention. If his strength were over-taxed, he would fail. 'It came to me as a real shock', Theiler stated and forthwith on the 27th April wrote to Mcdougall who immediately cabled Rivett that all arrangements were cancelled. Expressing himself profoundly disappointed, he wrote Theiler that he 'was sure Sir George Julius and A. E. V. Richardson would be very grieved. I hope your general health will improve and that you will be spared to continue your own research work and especially the magnum opus'. A month later, Stanley Baldwin's Conservative Party was defeated at a General Election and Ramsay Macdonald formed a Labour Government. Amery left the Dominions and Colonial Office and all his great schemes were consigned to less enthusiastic hands. Theiler had fallen between two stools.

* * *

Almost the first thing he did was to resume relations with P. J. du Toit with whom he had not communicated for more than six months. At the end of a long letter describing his circumstances, he flew a kite – 'I am seriously considering whether I should not return to South Africa where the

climate suits me best and where I might yet find some research work to keep me busy.' Partly as a result of the Imperial Agricultural Research Conference in October 1927, Onderstepoort, cruelly short of funds, was about to undergo a renascence.

89 At that time, Theiler had been much implicated in the Empire Marketing Board and had prepared constructive memoranda proposing the Board's subsidising research in certain fields at O.P. on a regular basis as well as encouraging Central Laboratories elsewhere in the Empire. The Conference had moved accordingly, formally requesting the Union Government to participate. Its representatives, G. N. Williams and P. J. du Toit then had detailed discussions with the Board which officially approached the Government in a despatch of the 31st January 1928 offering to pay for any additional general expenditure and suggesting that individual countries requesting enquiries into special veterinary problems should make their own contributions. With happy disregard of political animus, Hertzog's Government had accepted the proposal and undertaken to submit a detailed scheme. Prepared by Williams and du Toit, this was sent to Amery by Hertzog under cover of a note of the 5th September 1928. It involved an annual expenditure of £11,000 on services, equipment and buildings. Early in 1929, the Board approved it for a period of five years. Theiler had been in Australia while the negotiations took place but since his return, much activity had resulted at Onderstepoort.

Du Toit, involved in absorbing problems and planning, delayed his reply until after the South African General Election on the 12th June 1929 and Theiler, knocked off his balance by Stähelin's verdict and by impending eviction from his lodgings (the landlady had simply decided to give up), endured one of his periods of acute indecision. The family went visiting but once Margaret had left for the U.S.A., he returned to his muttons, saddened by the death of his 90 earliest proponent and friend, Professor E. Zschokke at the age of 74. He was, said Emma, 'with the exception of his rheumatism, fit and well and it is really a pity he hasn't more work'. His kidneys didn't in the least worry him but it was as well he hadn't gone to Australia as he would have over-worked and broken down. Now he was 'working for dear life on his bones so as to reach a point by the end of June when he will no longer need a lab . . .' Deprived of lodgings, 91 they contemplated various tours, first Scandinavia, then Italy. At the back of their minds was the thought that if Hertzog were defeated and the odious Kemp eliminated, they would return to South Africa. The result transformed them into wanderers. The Nationalists were returned with 78 seats against Smuts' Party with 61 seats (but more votes) and Hertzog was entrenched for another five years. Smuts resigned himself to more botanising and futuristic reflection (he was invited in July by Oxford University to give the Rhodes Memorial Lectures in November which 92 he gladly accepted). Du Toit then wrote to Theiler, noting the possibility of his returning with the forthright comment – 'I should like very much to welcome you back here'.

Theiler never left a problem once he had engaged it. Almost his entire professional life had been devoted intermittently to Horse Sickness and, if he had failed to find the fly believed to be its cause, he had at least devised an imperfect form of immunisation. By the same token he would not abandon his bone research once he had grasped the implications of the investigation. The different forms of malformation and disease at various stages of growth indicated valuable conclusions in feeding, particularly in remedying mineral deficiencies, and if he pushed on with his work, he might further revolutionise the stock-raising industry. Now he was homeless, all 93 his books, papers and correspondence locked in cases ('ich hasse die ewige Päckeri' – I hate the eternal packing, Emma confided to her children) and temporarily his life lacked firm direction. Scandinavia was abandoned but when Margaret returned from the States, they visited Germany and at Wiesbaden, stayed with Theiler's old East African colleague, Dr G. Lichtenheld. Arnold 94 had now decided to engage his rheumatism and resorted to sulphur baths at Schimberg. Both he and Emma became gravely ill with influenza and according to the unfortunate Margaret, 'it was

a waste of time'. They bade her farewell on her return to South Africa and feebly made their way to Aix-les-Bains for more dedicated treatment.

A month at Aix restored them both, even diminishing Arnold's rheumatism, and at last he
95 found time to answer du Toit's letter. 'I was very pleased to read that you will welcome me back', he wrote and described his immediate plans – a long visit to Florence to escape another severe Swiss winter and a month with Rössle, now professor of Pathology at Berlin University, before returning to his bones. He had been diverted by du Toit's continued involvement in Empire schemes and his collaboration with Walter Elliott in arranging Research Fellowships at Onderstepoort for Imperial candidates. 'It is amusing', he remarked, 'to see that Kemp has after all swallowed the Imperial pill! At least I hope he is not letting you down!' The early founding work done by Theiler in London was now showing result. His reports were being printed and
96 circulated (his definitive account of 'African Horse Sickness' would soon be published in Volume III of 'A System of Bacteriology in relation to Medicine' under the aegis of the Privy Council's Medical Research Council) and his recommendations were being put into practice by his successor. With Kemp providing no hindrance, Onderstepoort would be a changed place. 'The Theiler Institute' was certainly increasing its stature.

97 A creature of enthusiasms (some for 'toys', as Emma called them – the cinecamera, invaluable in Australia, was not much used thereafter), Arnold intended devoting his sojourn in Florence to acquiring proficiency in Italian (the better to understand lectures in Pathology at the local University) and to remedying deficiencies in his knowledge of the humanities. Emma of course would do likewise. To her unconcealed joy, they boarded in a pension Beau Séjour near the University with a Swiss cuisiniére and she was saved the ardours of housekeeping and cooking. Instead she became the slave of pen and typewriter. They arrived early in September in great heat when the University was still on Summer vacation and, comfortably if restrictedly accommodated in a small room where Arnold immediately mounted his microscope under the sole window, they began their study of Italian language and culture. Arnold early discovered that the Church
98 was the best linguistic teacher – the monks and clerics spoke slowly and distinctly, articulating every syllable. They accordingly regularly attended early evening service and solemnly recited Paternosters and Ave Marias, varying the venue from Santa Maria Novello to St Annunciata to hear an outstanding choir. They visited all the galleries, museums and historic sites and buildings, text-books in hand, and when Bisschop came specially in November to take his leave, he was
99 astounded at their expertise in Art. 'I showed him my knowledge of Florence as cicerone in a very satisfactory way', Arnold crowed to du Toit.

A routine enthusiasm was for journals, professional and otherwise. In Florence, he received the *Berliner Tierartzliche Wochenschrift*, the English *Veterinary Journal* and later also the *Veterinary Record*, the London *Weekly Times* and later at Lucerne, *Farming in South Africa*, the Agricultural Department's journal. Leo Weinthal continued to send the excellent *African World* containing excerpts from South African newspapers. Theiler was always widely informed
100 (which Princess Alice had noted, admiring also his 'great wit') and carefully watched current affairs. When Smuts arrived in London in October to give the Rhodes Memorial Lectures, he
101 could not forbear, feeling it his duty 'to add my welcome to the many others you received from your old friends', to send him the rueful reflections of the rejected. He longed to return to South Africa for his health and interests 'but since Kemp returned to office, I saw no hope of linking up again with my old connections. It is better to stay away . . . I feel that I am gradually forgotten but this is apparently the way of the world and I am submitting to it with quiet resignation.' Smuts made no reply.

Typically his lectures at Oxford University kindled the minds of men with new ideas and set in train a grand concept. Africa, he said, was developing under the control of European powers.

Different and often conflicting principles were being applied by them in the administrative, social, educational and legal fields. There was no survey of what was taking place in Africa as a whole. He pleaded eloquently for the compilation of such a survey which would include a review of the extent to which modern knowledge was being applied to African problems. The
102 gauge was picked up and with Carnegie and Rhodes Trustees' funds, 'An African Survey' under the direction of Sir Malcolm Hailey was launched. Theiler was invited to act as adviser on the relevant sub-committee which commissioned preparatory researches in 1933, and ultimately edited the chapter on 'Agriculture and Animal Health'.

The old man's thoughts gravitated too toward the einigkeit of his own family. He 'missed his
103 girls', he said and confided to Alfred that he now understood why 'Father and Mother opposed my going out into the world'. It had been good to see Margaret. Hans was proposing to spend a holiday in Europe. Gertrud, grossly overworked at the Huguenot University College and at odds with her senior colleagues, was thinking of leaving but later repented. Closely cast in her father's mould, she was already a member of the Council of the South African Association for
104 the Advancement of Science. Max in Boston was using Sellard's Yellow Fever virus to experiment on Rhesus monkeys; but Sellards, with a restricted budget, refused to supply additional expensive monkeys and Max was disgruntled. Emma kept in communication with all her child-
105 ren (though Hans seldom wrote) and grieved with Arnold that, wanderers as they had become, there was no home where the family could foregather.

A winter only slightly less severe than Switzerland now settled on Florence and with it, the reopening of the University. Veglia of Turin had given Theiler letters to the professors of Pathol-
106 ogy and he now presented them. There was some consternation about accommodating him but by the middle of November, he was able to move his microscope from the pension room where he had worked with difficulty, to a corner of an ice-cold laboratory almost insufferable to a weakened old man. He attended the pathological lectures of Professor de Vechi which he clearly understood but was confounded by the weekly discussion group when as many as seven disciples would simultaneously and emotionally declare their views in torrential Italian. Theiler had now conscientiously resumed the apparently endless task of analysing his massive collection of bone sections. The arctic conditions of the laboratory soon defeated him and he took his microscope back to the bedroom where he and Emma dutifully worked all day. She was checking and correcting his scribbled notes on his observations and typing them. They planned to leave in February and knew that his investigations could not be completed by then. It was in fact difficult to
107 concentrate. 'He works very zealously on the bones and sits the whole day over his microscope', she told Alfred, 'but his thoughts are much more with The History of Art and the Italian Language.' At night, they went to concerts.

108 Emma regretted the waste of knowledge and talents. True he could occupy himself endlessly with writing standard scientific works but he was worthy of more. He should be an emeritus professor at some University which would give him time for his own ancillary interests. Both longed to settle somewhere. In December, they wrote to Alfred asking him to find a many-storeyed house in Lucerne which Arnold could buy, reserving some floors for himself and letting the rest. Emma mistrusted the scheme. Alfred's proximity would be pleasant but Lucerne's climate was not the best and, more important, it was not a University town. Arnold would be severed from his associates in Basle, Berne, Zurich and elsewhere. The brute reality was that a professorship in Tropical Medicine for Veterinarians which Amery had planned for London with his eye on Theiler had not eventuated by the time Labour had removed him from office. It might be established in the future but Arnold would then be too old to occupy it. Realist as she intrinsically was, Emma was compelled to accept Lucerne and Alfred went about his appointed task while the Theilers were reminded of happier days by touching and enheartening visits from

109 Dr and Mrs Gilles de Kock and J. Quin (the first to graduate B. Vet.Sc. with honours, and appointed to Onderstepoort), bringing his wife on honeymoon. Much domestic gossip was dis-
110 cussed including the belief that the ambitious P. R. Viljoen would leave to become Under-Secretary for Agriculture. Arnold, much helped in forgetting the bitterness of the past, promised to reciprocate the visits by returning at some time to Onderstepoort.

The pious Alfred, always put upon by his elder brother, spent much time establishing that no suitable house was for sale in Lucerne and offered a commodious flat with basement in a private house overlooking the lake. The Theilers gladly and gratefully accepted it on lease for one year and, having sucked Florence dry, moved on to exhaust the remaining winter months in Mediterranean travel. As always, it was a busman's holiday. They toured Sicily extensively, exclaiming at its similarity to South Africa and Arnold visited the Zootechnical Institute at Palermo. Returning to Italy via Naples, he called at the Institute of Infectious Diseases and the Veterinary School. Intending to stay for two weeks in Rome, they telegraphed Alfred to send his daughter Klara immediately to join them in their further tour. Arnold was much impressed by the Rome Zootechnical Institute, calling also on the parasitologist Dr Allessandrini whom he referred to the hapless du Toit. He then visited the International Institute of Agriculture whose excellent library he intended consulting when he spent the following winter in Rome. Klara saw all the sights and was then transported to Perugia, Siena, Florence, Pisa, Bologna, and Milan before
111 returning to Lucerne. Arnold visited the Veterinary Colleges at Perugia, Bologna and Milan, gaining the interesting impression that Onderstepoort was well known to all of them, particularly its parasitological work; but no germane institution seemed to know anything of the work on Aphosphorosis.

They reached Lucerne on the 29th March to find Onderstepoort's customary birthday cable. Emma approvingly inspected the flat (samples of whose wallpaper Klara had brought so that all had been prepared and decorated from a distance) and got into the train again on the 1st April for Berlin. Rössle was in the chair of a Pathological Conference which Arnold wished to attend 'to bring himself up to date'. A week later they were in Basle for consultation with Professor Stähelin. He pronounced an all-round improvement but recommended more Aix-les-Bains. The rheumatism was decidedly better and the kidneys no worse. 'The rest has also greatly improved
112 my mind', Arnold told du Toit in a lengthy letter, 'I have forgotten many things that embittered me and I am forgetting others as well. Generally I feel happier and more contented than I have been for many years!' On the 11th April they took occupation of their new home in Lucerne, confronted by the huge task of unpacking their own cases and those sent by the girls from South Africa, in expectation of visits from their two sons and their wives.

* * *

With a variety of excuses (only two months leave, insecurity in his job, etc), Hans did not come. Gertrud intended a visit the following year and wrote of attending a vice-regal garden party in Pretoria. Hertzog had asked the Earl of Athlone to prolong his term for a further year and already the gubernatorial pair were grieving at leaving the country they had learnt to love. Princess
113 Alice sat down with Gertrud (smoking a clandestine cigarette inside Government House) and chatted about her parents, wanting to know where Theiler was and what he was doing. She would remember him until the end of her days. Far in Europe, Pa was pleased when he heard. Emma, long severed from housekeeping, struggled to re-learn it under Swiss conditions and was soon saved by an excellent maid-of-all-work Lina. The flat had extra bedrooms and all must be
114 readied for Max, Lillian and Noldi. Max, deprived of his monkeys, had been working on other experimental animals and had finally settled on rapidly-reproducing Swiss white mice. In a

series of highly-complicated experiments using the brains of these mice and cross-injections with monkeys and Yellow Fever victims, he was able to obtain a substance which protected the mice
115 from the disease. Before leaving for Switzerland, he reported his findings for various publications and attracted the attention of the Rockefeller Research Institute whose investigators wanted to repeat his experiments. Max was never deviated from his course and despite the exciting potential of his discovery, clove to his plan to visit his parents in June.

In the short meantime, their flat and their modus vivendi became the scene of turbulence.
116 Hardly installed, they were visited by Cowdry who, on his way to Kenya to make intensive study of tick-borne diseases, came specially to consult the master for a few hours before proceeding to Paris. (On his return via the Sudan and Egypt in September, he was unable again to visit Theiler
117 but remained in close communication – with, Theiler told du Toit, controversial result.) The old man never lost his grip on the development of veterinary science and was determined to keep
118 abreast of it. The failure of Trypanblue to combat Redwater in Australia aroused his interest in a variation called Piroblue manufactured by the Sandoz chemical firm in Basle. He agreed to promote it by submitting a report personally to the Societé de Pathologie Exotique and by the end of April, Pa, Emma and their nephew Alfred were in Paris where they exhausted themselves showing their sibling the sights.

With one eye on his bones, Theiler kept the other on the momentous marches of Science that would be given expression at a series of Conferences from June to September which du Toit was
119 coming specially from South Africa to attend – the Imperial Entomological Conference, International Poultry and Veterinary Conference, the meeting of the British Association for the Advancement of Science in Bristol, an Empire Wool Research Congress and finally, the routine Imperial Conference of Prime Ministers with adjuncts. It had evidently escaped du Toit, the old
120 man remarked, that the first international Congress of Microbiologists under the presidency of Jules Bordet would be held in Paris from the 20th to the 26th July. He intended attending 'to bring me up to date again in different subjects that I had to neglect since I left Onderstepoort'. Max would also be there.

Max, Lillian and Noldi arrived at Basle on the 10th June 1930. Theiler awaited them. He had not seen his son for six years and now there was a very American wife and a healthy engaging grandson. They reached Lucerne at midnight. Emma had made thoughtful preparations. Max, as was his wont, inclined to immuring himself and reading; but his wife had to be shown Switzerland. Arnold himself took them on a tour by lake-ship and train. In all the hullabaloo of their
121 arrival, he managed to write to du Toit in London 'to welcome you to the old country' and mooting the possibility of attending the International Veterinary Conference there in August.
122 Emma was sceptical. Arnold was piqued that the Colonial Office had appointed Montgomery as its Veterinary Adviser without first inviting him.

Stress developed in the Theiler household where a clash of personalities early declared itself. Hot-tempered and volatile, Lillian thought Arnold arrogant and authoritarian. Closely congenial with Max, particularly in his new attack on immunisation against a fatal virus, Arnold could enter into no rapport with his daughter-in-law. Emma, withdrawn and non-committal, watched with hurt and amaze as resentment rose on both sides. Perhaps Paris would help.

Entrusting Noldi to a nurse and the faithful Lina, the four Theilers left on the 19th July 1930
123 for the historic first International Microbiological Conference which du Toit, taking Theiler's advice, was also attending together with E. M. Robinson (in Paris with his wife on study-leave). It was Max's first international conference and pure joy for the old man to introduce his already distinguished son to the great men in his field. (There had been significant developments in it. Ernest Goodpasture whom Theiler had met in Pittsburgh in 1923, had evolved a revolutionary technique of culturing virus in eggs. Mechanical facilities had also improved. Theiler himself

prospered from new staining processes for his bone sections.) Max 'enjoyed it immensely' and Theiler was happy to resume his relationship with du Toit, unaltered and stimulating. Du Toit persuaded him to go to London. After less than a week in Lucerne, Arnold and Emma crossed the Channel, leaving the young couple to divert themselves with tours and visits. Basle was already a busy airport. The Theilers had seen Graf Zeppelin cruising overhead in his airship but, their children's enthusiasm notwithstanding, they never took to the air.

The father-figure of Sir Arnold Theiler, pioneer in sub-tropical veterinary science and now engaged privately on pathological work of high general importance, remained an ornament of international gatherings and a special pet to their hosts. The usual receptions, banquets and ceremonial tours were staged in London and its environs and much valuable colloquy was held. While Emma investigated new sights, Arnold re-established relationships with his peers and
124 entertained various proposals. Friends he had made in the United States enquired whether he would be prepared to spend six months or a year in California to assist investigations into Anaplasmosis. He was not averse, calculating that he would have finished his bone work early in 1931. The emissaries promised to confirm the proposal in writing on their return to America.

Together with Emma, he lunched in London with Sir Charles Martin, Director of the Lister Institute (soon to leave for Australia as Chief of the Division of Animal Nutrition and a member of the C.S.I.R.) and Sir David and Lady Bruce, both sadly failing in health. The Theilers had visited Harry Green in St Andrews Hospital where he was making notable progress toward recovery of his mental equilibrium. Du Toit, affairé and harassed, promised to visit them shortly in Lucerne before officiating at the Bristol B.A.A.S. meeting. It had all been very unsettling and confirmed Emma in the view that Lucerne was no place for Arnold. It was remote from his academic interests (Alfred was preoccupied with his own affairs and took his family away on holidays) and, lacking self-expression, he found little pleasure in fulfilment when driven in upon himself. Expecting a succession of visitors, they returned to their flat in the middle of August to confront a painful situation.

Admittedly the weather had been vile and the unilingual Lillian had been precluded from making the acquaintance of local Swiss; but neither factor seemed to justify the dikke luft that developed in the flat, hurtful to Emma and embarrassing to Max. With Arnold and Lillian at daggers drawn, crisis was inevitable. Arnold went to Basle to fetch du Toit and the following day, both accompanied Max and his family to the Calais train in Basle station in a sudden and wounding departure for England. Although there were other house-guests, constant visitors (including Schwetz of the Belgian Congo) and much enforced entertaining, the flat was suddenly empty.
125 'Without Noldi', Emma wrote, 'our house is as if dead. We miss him terribly and it is good that Miss Voss and du Toit are here to help us over the next few days.'

For Arnold, it was easier. All his sense of deprivation disappeared in the presence of the perfect person to understand his work, his problems and his needs. In one week, du Toit was rushed
126 about Switzerland into Germany in an official car (provided by the State Veterinarian, Professor Burgi in exchange for Onderstepoort's assistance in supplying Redwater- and Gall Sickness-infected animals to immunise Swiss calves for export to Brazil) while Theiler talked torrentially and often far into the night. He opened his heart and his mind to his friend, telling him of his progress so far with the sectioned bones and outlining the further revelations possible if facilities were given him. Du Toit readily realised the importance of his work, the value to it of stored reservoirs of bone material at Onderstepoort that Theiler himself had cached, and the contribution which other investigations, notably at O.P., the Rowett Institute, Cambridge and other laboratories, could make. His interest and enthusiasm fired Theiler anew and they made plans
127 based on collaboration. Theiler proposed coming to Onderstepoort to extrapolate his quest and du Toit would assemble relevant experimental material of which Theiler would provide a list.

Their felicious relationship was rekindled and they parted in a glow of mutual trust and respect. Du Toit wrote of 'having enjoyed every minute of my stay and learned a great deal', being as good as his word in immediately discussing with Orr in London the availability of a Cambridge analysis of pig bones. Theiler, he wrote, must now write to Orr. He himself would soon go to Bristol for the B.A.A.S. meeting at which, as president of the Agricultural Section, he would deliver a paper, now illustrated by the old man's slides lent in Lucerne (it was 'very well received' and was reproduced in *Nature*).

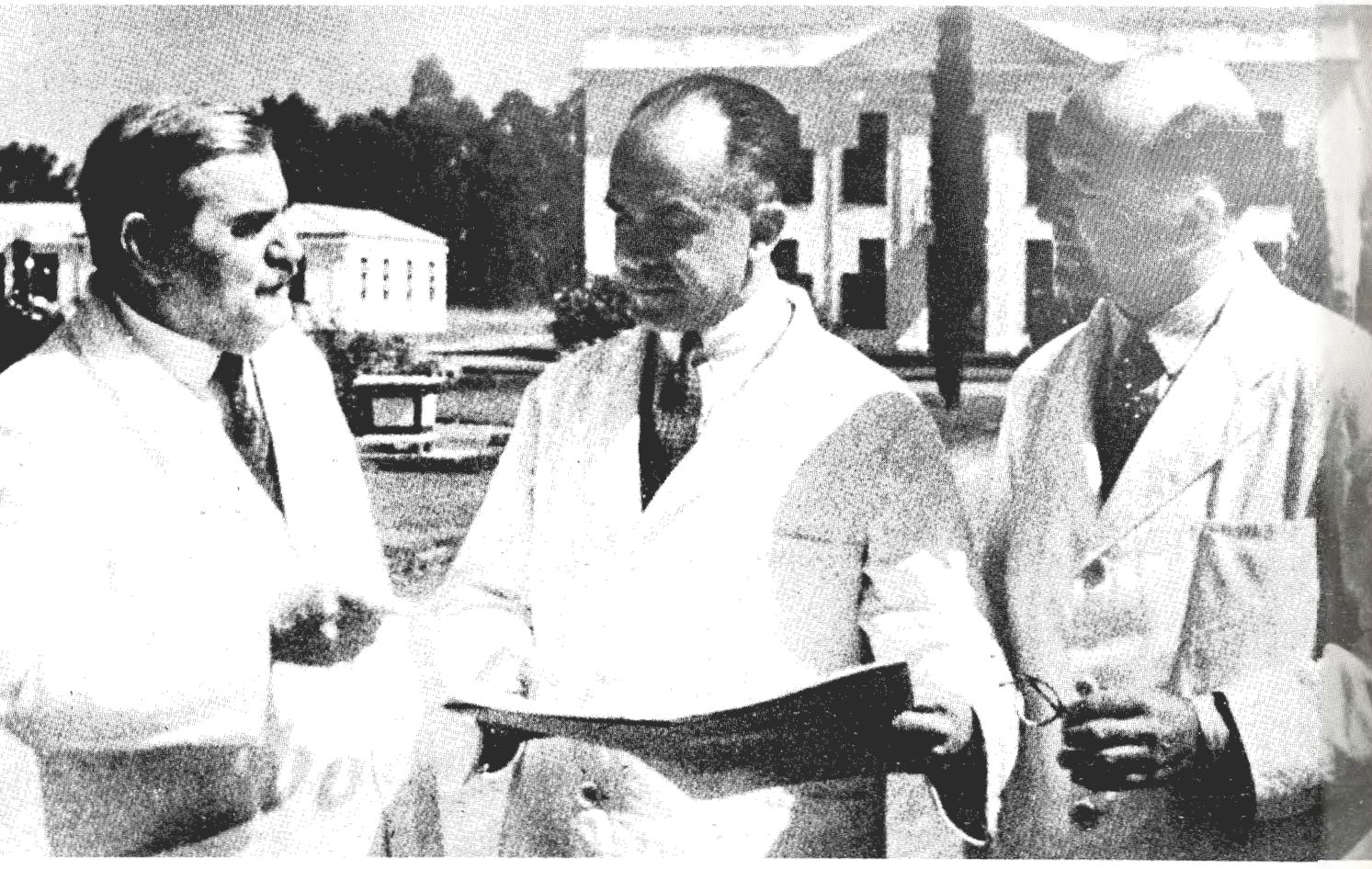
Over-run by visitors, Theiler took time to reply – 'I think often with pleasure of the visit you paid us here in Lucerne', he wrote, 'and I am pleased to see that things between us are as they used to be of old.' Emma rejoiced that he had so much enjoyed du Toit's brief stay and that they had had time to talk themselves out. 'Pa has also become a little more reasonable', she told the girls, 'and is no longer so bitter.' Before he left England on the 24th October, du Toit confirmed – 'I shall do my best to have everything ready for you when you come out and may I say again that it would give me unbounded pleasure if you could carry out your intention to come to Onderstepoort' – inspiriting words for the old man.

He meant to go back to his bones but was constantly interrupted – lunch in Lucerne with Sir John M'Fadyean and the widowed Lady Stockman and suddenly in September, Dr H. R. Seddon, Director of the New South Wales Veterinary Research Station and his frequent host and collaborator in Australia who 'talked shop until midnight'. Then the annual conference of the Schweizer Naturforschende Gesellschaft at St Gallen, a ceremonial and lengthy occasion which exhausted them both and imposed a further week for recovery. 'Pa has now had enough holiday', Emma noted and returned to deciphering his scribbles as he recorded the microscopic features of countless bone sections. There was still the vexatious question as to whether he would go to California. The promoters had written asking him to consult a Dr Schilling in Germany but the proposal remained indefinite.

Max had returned to Harvard and wrote that he had twice seen Mrs Green in London and that she was delighted with Harry's progress, hoping he would soon be discharged. Max had sent his parents a reprint of his work on Yellow Fever – 'a very good publication with a mass of work in it', they pronounced professionally; but he was now unhappy in his work. Strong had gone to South America and Sellards became acting chief of his department. There was no more money for experiments and Max was forced to continue the development of his discovery with mice instead of costly monkeys. Things were different at the Rockefeller Institute in New York. Many investigators had died from Yellow Fever and Max, accidentally immunised, was a desirable property to scientists determined to find a vaccine. He entered into pourparlers. Early in 1930, he was offered appointment under Wilbur A. Sawyer on his own terms. Lillian saw to it that they were double his salary at Harvard.

Theiler was now working hard. There was no question of escaping the winter abroad. The lease of their flat expired in February 1931 and, as all his bone material was already sectioned, he remained steadfastly within, comparatively warm, and had no need of a laboratory. He had examined and described his countless specimens, Emma had copied his notes and he had written an account of his observations which she also copied. Then he began all over again, reviewing every specimen and making additional notes and corrections for amending the article. 'Pa's writing is so bad', Emma, a travel- and work-worn woman of 62, told the girls, 'that it is quicker for me to copy it by hand,' Finally she would have to use the typewriter, already constantly employed for his letters. His dedication was so strict that he had failed to advise du Toit of the deficiency experiments he must mount and the collection of bones he must assemble. 'I have recently been busy all day writing up the results of my investigations with the histology of the normal growing bone', he at length wrote him, 'and have postponed correspondence'.

General J. C. Smuts addressing Sir Arnold Theiler (left) before presenting the Gold Medal of the Royal British Agricultural Society at the Rand Show in Johannesburg in March 1935.



Historical Photograph taken in 1935 when three directors of the National Veterinary Research Institute were together at Onderstepoort – (left to right): Dr P. J. du Toit (present); Sir Arnold Theiler (past) and Dr R. Alexander (future).

138 The first draft was entitled 'Die Rolle des fibrösen Bindegewebes in Dicken wachdtum der
139 Rinder Knochen'. His following letter to du Toit listed an enormous and detailed number of bones from cattle for the study of the growth of the bone. They included specimens from pigs and sheep suffering mineral deficiencies and Theiler gave greatly detailed instructions on how they should be prepared. Samples of wool and pieces of skin should also be taken from the experimental sheep. Du Toit, thinking of the expert assistants he would have to allocate to the old
140 man's demands, recoiled at the sight but undertook 'to go very fully into the question of the necessary bones for your study of osteomalachia'. He was about to welcome Sir Charles Martin for a week at Onderstepoort, a visit to Armoedsvlakte and other centres before he assumed duty in Australia.

The old man now had some sense of achievement and laboured on to refine his results with the pistol of February departure at his head. He planned to finish the winter touring North Africa.
141 Emma was not well. Her heart was troubling her. Nothing more had been heard of the California appointment and no obligation now lay upon them. Instead, further honours came. 'His
142 French friends', as Emma called them – Roux, Calmette, Mesnil and Leclainche – secured his election as Membre Correspondent de l'Institut de France, tantamount to Fellowship of the Royal Society. It was one of the highest scientific awards and Theiler was justifiably proud, addressing himself with renewed vigour to his work. Then the Council of the British Association
143 for the Advancement of Science asked him to accept a vice-presidency of Section M at their commemorative Centenary Celebration in London in September. Theiler knew that he owed the honour to the Section's president, Sir John Russell, a longstanding admirer who had attained his own eminence in agricultural research by a way almost harder than Theiler's. He accepted joyously, wanting to meet General Smuts who had been highly honoured by the
144 Council's invitation to preside at the historic meeting. Soon after, the American Society of Parasitologists made him an honorary member. His name and attainments still lived in the
145 United States. In February 1931, a cable came from Philadelphia similar to the California approach, asking him to accept appointment as consultant. Theiler provisionally agreed and received a further cable. Philadelphia was not as attractive as California and he would wait to see what the confirming letter said. For the dwindling Emma, it was die ewige Packerei again.

In their last days at Lucerne protracted until the 8th March (they had renewed their lease and retained Lina) with snow falling heavily, Theiler all but concluded his bone investigation. It had grown into a lengthy work, too long for publication in a journal, he feared, and wanted only
146 correction. It must wait until they returned from North Africa. Du Toit had wanted to send bone specimens selected by Gilles de Kock from deficiency experiments but Theiler stopped him. They and his other requests should wait at O.P. until he came in 1932.

Of their seven weeks absence in North Africa and France (while snow fell continuously in Switzerland), Theiler wrote so fascinatingly, both professionally and personally, that du Toit
147 called a general assembly of the staff at Onderstepoort to read his long letter to them – 'everybody enjoyed it immensely'. Unrecorded in this communication were the 'Cook's Tours' by bus and motor car which Arnold and Emma dutifully undertook, some purveying belly-dancers, whirling dervishes and other local specialities. For the most part, Theiler was occupied with his colleagues who made much of him, drove him over their domains and showed him everything they were doing on the land in 'élevage' or husbandry and in their laboratories. Landing at Tunis enfeebled by seasickness but restored by the Hotel Splendide, he visited the local Pasteur Institut under C. Nicolle in charge of research with Balozet as chef de service, and the Institut Arloing. Emma was well enough to enjoy the motor tours and to rest in Algiers while Arnold was made welcome by his old friend Eduard Sergent, head of the Institut Pasteur who required
148 advice on fly-traps and grasses for pasturage. The two men 'had a glorious time', Emma wrote,

'Sergent was very kind to us. We were his guests in the best hotel and every afternoon he fetched us in his car and took us far into the country so that we learnt to know the surroundings of Algiers for a distance of 100 kilometres.' Sergent profitted by much Theiler wisdom and du Toit suffered from hints dropped of observations that might be made on peculiarities that Theiler had noticed. In Algiers, Arnold received the customary O.P. cable on his birthday – he was 64, vigorous but very tired at night.

Then, still in funds and time, they took another tour to Morocco – Oran, Ouija, Fez, Rabat and Casablanca – which entertained them less. Again Theiler was made welcome at the Casa-
149 blanca Institut Pasteur by its director H. Velu. He was also cajoled into addressing the local Societé de Medicine et Hygiene and gave a more or less extempore' causerie sur l'aphosphorose du bétail'. He was much impressed by the developmental activities of the various branches of the Institut Pasteur in French North Africa and their readiness to learn and practice the results of South African work.

Sailing from Casablanca to Bordeaux, they left immediately for Toulouse on the same
150 tourist-veterinary errand. Arnold visited the Veterinary School and, acclaimed by its professors, was lunched by them with Emma enjoying red and white Bordeaux and champagne. Thence as tourists to Nimes, Arles, Avignon and Orange on their way to the historic first veterinary college at Lyon whose Dean, Professor Porcher, had invited him when they met at the World Dairy Conference in Washington in October 1923. With his colleague Professor O. Marotel, Porcher did Theiler the honours becoming to a member of the Institut de France and du Toit suffered the consequences. Marotel was intrigued by Theiler's graded set of spoons for administering the wire-worm remedy (the object of widespread interest) and among numerous other requests, du Toit was asked to send several sets as well as the latest information on milk-recording in South Africa. By train to Geneva and Berne where Theiler was not yet done, insisting on visiting the Veterinary School and consulting with Professor Burgi over lunch. Back in Lucerne before the end of April, they found 'a mountain of newspapers' and letters but none from Philadelphia. Max imparted that he was very happy in his new job in New York, especially
151 as he had been promised assistants. He had been cleared of all trace of bilharzia complications when he left Boston and the attacks of pain had long since ceased. His future was promising.

Dragged across North Africa and Europe, Emma had wilted. Their tour had been enjoyable but exacting and had done her heart no good. Walking still made her breathless and distressed.
152 Climbing the stairs to their first-floor flat became an ordeal. Shortly after their return, Arnold took her to Stähelin in Basle who diagnosed Ascitis and put her into hospital on a digitalis treatment. He said she had a heart defect of 20 years standing. Arnold returned disconsolately to Lucerne and during the two weeks of her treatment, visited her every few days. He was dis-
153 tracted in his loneliness by the visits of P. J. J. Fourie, now purporting to idolise him, and a younger research assistant of Onderstepoort, Bekker with their families. They talked of the menace of Foot-and-Mouth disease which was advancing south from Rhodesia and causing du Toit much concern and travel. At O.P. there was more than usual chatter among the staff. Theiler was not surprised that Viljoen had forsaken Science for Administration as Under-Secretary for Agriculture, believing him more interested in power than professional prowess. Fourie himself had been promoted to a Sub-Director of Research over the heads of Curson and
154 Robinson. Both complained but said Emma, when told, 'it is Kemp who rules'. The desire to
155 return dwindled in Theiler nor would he go to America. When a copy came of Philadelphia's letter which had been lost (inviting him to make a study of Anaplasmosis and give some lectures), he refused.

Emma professed to be 'notably better' but exertion still distressed her. Arnold found it hard to continue his bone investigation. Their flat had become a magnet to almost everyone they had

ever met and some of the visitors (including Alexander of Onderstepoort where the Empire Marketing Board was building a beautiful library) stayed with them. In the intervals, Arnold occupied himself with 'a new plaything' – a microphoto camera essential to the illustration of his work which took him long to master. After months of experiment, he made a routine of taking four microphotographs of bone sections each night and developing them in the bathroom,
156 converted into a dark-room by one of Emma's O.P. curtains. By then a significant element had re-entered his life.

157 Harry Green began writing him quasi-normal letters though still protesting that he wanted to expunge his 'crimes'. He asked Theiler's permission to quote him as a reference in an application for a Beit Scholarship to study at the Bureau of Animal Health at what Theiler, with his mind on O.P. and Armoedsvlakte, called 'Weighbridge'. Green was voluntarily 'trying his
158 hand' there with his old colleague Andrews in charge. It was, said Emma, 'a happy piece of news'. There had been times at Onderstepoort when Mrs Green (who returned to school-
159 teaching to support her family during her husband's illness) had alleged that Arnold 'exploited' Harry. Arnold, inspired by his vision of solutions to veterinary problems, drove all his men. (A few like K. F. Meyer and Marcus Zschokke, objected to his domineering manner and left.)
160 The stronger shared in it and kept their character. The weaker, like Robinson, allowed themselves to be dominated. Harry Green was neither. Arnold considered him a coeval partner in important
161 work. The malicious allegation that Theiler had been the cause of his losing his reason was unfounded. He became deranged almost a year after Theiler had left. Now he was all but restored.
162 Du Toit too received lucid letters. The Theilers invited the Greens to spend a holiday with them in July.

In the time intervening, Arnold cut a summer caper in which Emma refused to share. Having
163 occasion 'to keep up to date' and check his bone work at the Alfort Veterinary College and Institut Pasteur as well as attend Journées Veterinaires Coloniales and a meeting of the Academie des Sciences in Paris, he invited his brother to accompany him. The sober pious Alfred who had never before visited la ville lumiére, occupied himself with bus tours and even attended the Folies Bergéres by himself. He went with Arnold to some of the meetings and to operas in the evening, returning to his school a day late and talking interminably about the pleasures of Paris. Arnold too was pleased. His colleagues had received him with homage.

On the 28th July 1931, the Green family arrived.

* * *

Green was Theiler's touchstone, more evocative even than the 'brilliant' du Toit (who never acquired the old man's inspiring driving effect of his men). As Emma had surmised, Theiler was starved of scientific communication in Lucerne. When Green arrived, his mind was at once transfused with energy. Emma found Harry 'tedious' because of his habitual analytic approach
164 – even in ordinary conversation when he would dissect the most trifling comment. For Theiler, that was his most valuable quality, short of the soundness of his work. They discussed the bone investigation in which Green, catching fire from his 'old chief', took the liveliest interest. They looked at the microphotographs of malformations and considered the problem of identifying their specific source, at what stage of growth, to what degree and to what extent preventable. Theiler read his bone sections like the rings of a tree. A vast field of research was revealed, as captivating to Green as to Theiler. They saw it all clearly and contemplated a programme of
165 enquiry that would cover it, giving results of great value to veterinary science and to the livestock industry, Talking and making notes every morning and then with excursions intervening, far into the night, they proposed allocating sections of research to various institutes including

166 Orr's with a grand plan for Onderstepoort. 'We hope', Theiler wrote to du Toit three months later, 'to establish the old trio – Theiler, Green and du Toit – although working in different parts of the world. I shall write you in full details and you will then be able to let us know how far you can join.'

Green was, in the Theilers' favourite phrase, 'as of old' – alert, prescient, exhaustive in his perception of the dimensions and intensity of the subject. If bones failed to grow or, having grown, became soft or stiff or rickety, it would fall to him to identify the chemical causes in every detail of circumstances and degree. Theiler had closely studied normal bone-growth the better to emphasise aberrations. He wanted specimens of those aberrations – Osteoporosis, Osteophagia, Osteomalachia and the like – which du Toit had already begun to produce experimentally at O.P. in readiness for his visit in 1932. His deductions from a study of them would be of the highest scientific interest. But there were personal problems. Green, connected only voluntarily with the Weybridge Bureau of Animal Health (the Beit grant was not awarded him) had no source of income beyond writing scientific articles and making abstracts from esoteric papers for veterinary journals. In straitened times, there was no appointment available to him. Theiler had accepted invitations which impeded his own work – the Centenary Meeting of the B.A.A.S., three lectures (paid) for London University, numerous addresses to scientific societies, attendance at conferences. He could not extrapolate his field until he had completed his basic histological study whose endless corrections tried Emma sorely.

Green left Lucerne re-animated by three weeks in a changed scene and an inflammatory mentor. They met a month later in London on one of the most glorious occasions in the annals of Science planned as only the British can to the last detail of exhibitions, tours, receptions, banquets, visits to laboratories, institutes, etc. and of course grand and sectional meetings. The President of the Centenary Meeting was General the Right Honourable J. C. Smuts P.C., C.H., D.Sc., F.R.S. supported by a host of Vice-Presidents including the Prince of Wales, Cantuar, Ebor, the Prime Minister Ramsay Macdonald, the High Commissioners for all the Dominions, the Earl of Athlone, Major-General Sir David Bruce and many other notabilities. Panoply and ceremony characterised the opening events. Smuts ('impressive in his defiant
167 energy', as one observer noted) was installed in the Albert Hall as President of the Meeting in the presence of a distinguished audience including his friend Athlone who that night would take Princess Alice to the Westminster Central Hall to hear him inaugurate the sessions with a polemic address on 'The Scientific World-Picture Today'.

Smuts, deeply moved, was the lion of the moment as he generally was in London. He had given his best thought to a speech which, delivered to a concourse estimated at 5,000 of the world's most eminent scientists, would have appeared an effrontery from any other source. But it was the emotional significance of the event to himself and his country that most smote him. 'This day 40 years ago', he said in his high thin voice, clipped and accented, 'I sailed from South Africa to continue my studies at a British University (Cambridge) . . . Much has happened in my personal life. But nothing can equal this occasion where, in your desire to mark the Imperial character of this Centenary, you have chosen me as a Dominion representative to preside over it. It is the crowning honour of my life. South Africa looks upon this as an honour done to her-
168 self as as part of the romance of her own story.' He went on to deliver the speech of a visionary which, according to his official biographer, was still valid a generation later. Certainly it con-
169 tributed to the glory and distinctiveness of the occasion (it was recorded on gramophone discs and placed on sale by the Association).

All the sessions at which Smuts presided were crowded. He was in the chair when Sir John
170 Russell, a world traveller, gave his presidential address for Section M-Agriculture, cursorily surveying advances in all the Dominions. Theiler sat among the throng listening to his comment

on Canada, his mention of A. E. V. Richardson's contribution to Australia and then, at greater length, South Africa. 'The first to attack the problem (of the livestock industry) seriously was Arnold Theiler. It is difficult to overrate the value of the service he has rendered to South Africa as a country and to farm animals the world over' and Sir John detailed the diseases which Theiler had combatted and the Institute he had created, concluding elegantly with a tribute to his distinguished successor – 'Dr du Toit, in his brilliant presidential address to this section last year, set out the history and present achievements of veterinary science.' It was a proud
171 moment for the old man. In the press around Smuts, he managed to exchange some words. Smuts told him that his friends at Onderstepoort were looking forward to his return.

172 Theiler was one of eight vice-presidents of Section M but in Sir John's absence, it was he who
173 took the chair. Green had put his paper – 'The Pathological Aspect of Mineral Deficiency in Cattle' – into good English and it was duly published in the *Veterinary Record*. It emphasised
174 the effect of phosphorus deficiency on bone structure. 'Rickets and Osteomalachia in pasture cattle', Theiler said, 'must be considered as advanced stages of a true Aphosphorosis, by which term we understand a definite syndrome typical of phosphorus deficiency: Osteophagia, Osteo-
175 porosis, Rickets (in young) and Osteomalachia (in adult animals).' Orr was anxious to pursue the theme in his journal and discussed it with Theiler and Green. He wanted them to write a review of deficient pastures and their effect on cattle from all points of view. Green would compose it with Theiler's collaboration.

Since his Armoedsvlakte days, Green had kept Aphosphorosis in view and watched the work of other investigators in different animals in other parts of the world. His pitiable personal
176 situation was suddenly ameliorated. The Director of the Wye College of Agriculture in Theiler's presence offered him a one-year appointment at £500 with promise of permanency (though he longed to be at Weybridge where he had a cottage) and here was Theiler himself, affirming unbounded confidence in his ability and prepared to associate his name with Green's author-
177 ship. Orr waited four months for Green's meticulously studied and elegantly composed paper. Theiler considered it 'excellent – as good or even better than any he has written so far'. Entitled
178 'Aphosphorosis in Ruminants', it was published in July 1932 in Orr's *Nutrition Abstracts and Reviews* issued by the Imperial Bureau of Animal Nutrition of the Rowett Institute at Aberdeen. In common terms, it directed attention away from the currently popular 'vitamines' and calcium administration to the merits of phosphates in the diet of productive stock. For Theiler it seemed the prelude to resumption of 'the old trio' – Theiler, Green, du Toit. Carried away,
179 he urged du Toit to get a South African honoris causa degree for the English Green. In the political climate of the time, it was 'so very delicate a matter' that du Toit could hardly try.

As Smuts departed for his riven land, disastrously sunk in drought and the Great Depression accentuated by Britain's abandoning the Gold Standard two days before his 'crowning honour' (Ramsay Macdonald then led a 'National Government'), the Theilers were compelled to consider their own situation. Arnold's pension would still be paid by special arrangement in South African pounds but income derived from English investments (which, contrary to Emma's advice, he had made with money previously invested in South Africa) would now be paid in devalued English pounds. Impetuously he planned to leave Lucerne, donate his select library and live in London. At some time he would go to Onderstepoort to continue his osteodystrophic work. For the moment, with Afrikaner assertiveness obstinately paramount to the point of ruination of the country, he would not propose himself for a visit. Gertrud, who was making her way in esoteric circles in the Council of the South African Association for the Advancement of Science, would soon come on long leave and give an account of the local scene. She would also go to the U.S.A. and bring back news of Hans and Max. His parents were deeply concerned
180 about Hans – 'ein rechter Pechvogel' (a real unfortunate), Emma called him. His wife suffered

so grievously from asthma that she needed four injections of adrenalin a day and fought for breath at night so that Hans hardly slept. Max, happily pursuing his researches with mice (of
181 such value to the African Colonies that the French and Belgian Governments sent men to study them), must do what he could to help them in Boston.

The stimulus to complete the initial stage of his bone work suffered from Theiler's intermittent assignations and occasional colds. Hardly had he resumed after the London visit than
182 Paris called for a week's attendance at the Colonial Exhibition and other diversions. Upon
183 return, he was invited, all expenses paid and a daily allowance, to attend as an adviser a conference of the Tropical Section of the International Agricultural Bureau in Rome (whose library he had recently visited) and deliver a paper. He spoke on the Osteodystrophic Changes on which he was working and the Conference resolved to enquire into them in tropical and sub-tropical countries. Braving a second winter in Lucerne, he laboured to put his text and microphotographs in optima forma for printing, distressed by the news that Lady Bruce had died on the 23rd November 1931 and Sir David four days later. Reports from South Africa were equally depressing – at a time of desperate economic stagnation with dreadful suffering at all levels, the community was reft by bitter racial and political animus. Contrary to Smuts' advice, Hertzog's Government stubbornly adhered to the Gold Standard and the country drifted into utter ruin. Theiler kept writing to du Toit about the experiments supporting the second phase of his work
184 and du Toit kept asking when he was coming to Onderstepoort to pursue it; but Theiler maintained an enigmatic silence. In the meantime, with Emma's indispensable help, he managed to get his manuscript to the printers early in 1932.

185 Toward the middle of January 1932, Gertrud arrived in Paris at the same time as King, her father's previous secretary, and between them, they told the awaiting Theilers of the calamitous state of South Africa and of the obduracy of Hertzog and his advisers in clinging to the Gold Standard. There was universal suffering and rancorous division among the people. All sections of the population were without money and the Government drastically reduced its allocations for State services. The Governor-General the Earl of Clarendon voluntarily reduced his salary.
186 Onderstepoort was lamed with the rest and du Toit wrote forebodingly that its experimental work including Theiler's requested tests, would have to be curtailed in 1933. Again he asked when the old man was coming; but on his birthday when the customary cable came, he was touring Spain with Emma and Gertrud to escape the worst of the Swiss winter. When they returned, the proofs of his lengthy 'monograph' were due to arrive for correction. Theiler was
187 shocked by the death of Professor Burgi. One by one, his colleagues were going. The message was clear.

The old man tried to get on with further phases of his work but Green, 'extremely busy' at Wye and too punctilious to scamp an important concept, had not yet drafted the programme of enquiry which he and Theiler had discussed. Further, the distractions continued. In May, while Gertrud was still on her six-month visit to the U.S.A., he went with Emma again to Rome to attend a meeting of the International Agriculture Bureau and give a paper on the effects of mineral deficiency. When she returned bearing first-hand news of Hans and Eleanor, Max, Lillian and Noldi, they did a short tour of the French-Italian Alps before she left for South Africa. Emma then began the struggle of incorporating Arnold's numerous corrections and alterations of the printers' proofs which returned again for final approval.

188 Arnold began an examination of Osteofibrosis of the bones of horses supplied by his friends in Ceylon and Tasmania. In undistracted time, they both worked hard, their peace of mind
189 temporarily disturbed by reading in the *Veterinary Record* that Montgomery had died. In October they had dined with him and his wife in Soho, talking of his forthcoming visit to Onderstepoort on his way to Rhodesia where Foot-and-Mouth still wrought havoc. Now he was gone –

the man who had succeeded Theiler and later taken the job he had once coveted. Dark thoughts went through the old man's mind. A sense of urgency began to possess him and a recurrent restlessness.

The key to the completion of his work in all its magnitude was Green, now reaching the end of his year at Wye and denied the promised permanent employment through shortage of funds due to the Depression. He wrote an 18-page letter to Theiler about their mutual interest and his hope of getting an Empire Marketing Board grant to work with Andrews at the Weybridge Bureau of Animal Health. (Several such Fellows – Mason, Rimington and others – as well as Rockefeller Scholars were already working at Onderstepoort.) Green wanted Theiler to come to England which Emma opposed, knowing he would give his library to the Weybridge Bureau. The strong pull of Africa had lost its force. Conditions in the Union were appalling and Theiler reacted bitterly to the racial hatred loosed on a tragic scene. Hertzog and his Afrikaner supremacists, blinded by their ideology, continued to ruin a bankrupt land.

As Green's time at Wye ran out, Theiler commissioned him to come for 10 days to Lucerne for consultation before, successful in his application, he began work at Weybridge on the 1st October 1932 for a provisional year. It was a time of travail for Emma. Between proof-reading, she and Arnold had compiled a list of 150 leading scientists and institutions to whom he should send the result of his long labour on Osteodystrophic Diseases. Early in September, the copies arrived, reprinted from the Denkschriften of the Swiss Natural Sciences Society on the best heavy paper and most worthily reproduced, particularly the host of Arnold's own microphotos which illustrated it. Each copy, weighing nearly two lbs, had to be packed and addressed by Emma and Lina and carried to the post office some distance away. The stalwart Lina could not manage more than ten at a time. The process took weeks and it would be long before opinions of the work could be received.

Green arrived on the 9th September 1932 and Theiler was again able to sharpen his wits. He had needed the stimulus and understanding. They ranged over the further analysis of bone changes in relation to chemical deficiencies with a view to Green's definitely drafting a supporting experimental programme. 'Green and Pa', Emma told the girls, 'work the whole day either at the microscope or over the various articles Pa has begun.' He had many commitments including the formidable series of three lectures at London University in March. Green brought all his influence to bear in persuading Theiler to continue his work at Weybridge. It was a haunt of his protégés. Andrews was installed there and recently James Walker of Nairobi on the verge of retirement (he visited Theiler in Lucerne in October) and D. T. Mitchell of Rangoon had called. He would be very welcome and there were all facilities. Emma strongly objected – there would be all the in-fighting of Onderstepoort and none of the pleasantness, she would never again set up house in the country (for civilised pleasures, London was too distant) and they would have to live in a boarding-house. Arnold wavered. After all the excitement of his work appearing in print and Green's visit, he was not feeling well. If he transferred to England, he would have to pay heavy tax. Perhaps South Africa might be better. Gertrud must find out where the death duties would be most advantageous. On the 21st September, he went to Basle to consult Stähelin.

Theiler was now 65 and outliving his contemporaries but energetic in mind and purpose. Stähelin diagnosed arterio-sclerosis and counselled avoidance of strain. Emma was pleased. Arnold now walked slowly and she could keep up with him without straining her own heart. They had been married for 39 years. The partnership continued as arduous and fruitful as of old. He was now bending his best efforts on 'The Significance of Calcium and Phosphorus in rearing Ruminants' – a paper which he would read with slides in Zurich and Berne and which would be published the following year by the Swiss Natural Sciences Society and the

201 Swiss Veterinary Archives. It was 50 pages long and Emma typed incessantly. She kept his accounts and typed all his letters and manuscripts.

By the time Theiler delivered his lecture in November 1932 (with 68 slides, it took two hours), the first ripples of applause reached him from local scientists who had read his published monograph – 'Untersuchungen über den Bau normaler und durch calcium- und phospharme Nährung veränderter Rinderknochen' (Enquiry into the structure of normal cattle bones and those altered by calcium- and phosphorus-deficient feeding). Soon they grew in waves from all over
202 the world. 'Your magnificent report!' du Toit wrote and from America came approving
203 comment from investigators in the same field. Arnold told Emma to ask Gertrud to make a précis of the monograph for the South African Press so that 'scientific scientists who are not
204 veterinarians would know that he is still working'. In time, it was considered his magnum opus – the scrupulous revelation of a new field promising great increase in knowledge and improvement to the livestock industry – but immediately, recognition came to him. The European Press (Alfred was the first to see it) published the news that he had been made a Membre Correspon-
205 dent étranger de l'Academie de Medicine de France. 'The French', Emma remarked, 'have now given him all the honours that they have.' The British had hardly begun. A week later (28th November 1932), a letter came appointing him a Corresponding Honorary Member of
206 the Royal Society of Medicine. 'Pa', wrote Emma, diverging into English for the occasion, 'is as pleased as Punch! He has recently been quite well despite his pulse being very irregular.' What pleased Pa was that 'although out of any official position, the scientific world has not forgotten me.'

Only Theiler and to a lesser degree Green could visualise the extent to which the extrapolation of his work on the causes of defective bone structure in domestic animals would affect the agricultural economy generally. The vision impelled the old man to further effort. He returned to
207 his microscope and the investigation of Osteofibrosis in equines (his bone sections were now
208 made for him in Basle) and he wrote to du Toit. He sent him 'a kind of programme' which Green had finally drafted after the September discussion, saying 'I have not sent it before because I felt for a while that I should not live so long to see its conclusion and do my portion of the job . . . Things looked for a while very unpleasantly; they have however improved a little and Stähelin now thinks more of a nervous trouble. I begin to feel again I may as yet have a prolonged lease of life.' He asked du Toit to indicate how much of the programme Onderstepoort could undertake. 'I want', he said, 'to clear up the question of Osteofibrosis in horses and so to satisfy my last ambition. If you can help, do so and we shall once more put our names with that of Green under a piece of work that is of fundamental importance.' He wished 'all at O.P. a Merry Christmas and a happy New Year and d . . . the crisis!'

Two days after Christmas, South Africa abandoned the Gold Standard and hopes of racial peace and prosperity were fastened on a Coalition Government.