

LIKE THE Irish Famine on which the general public (and Queen Victoria) turned a blind eye, the ravages of Rinderpest were never fully assessed ecologically. As much as the Jameson Raid veiled the approaching pandemic, so the Boer War obscured the changes it wrought.

Some were trifling. The shortage of meat, for instance, and the general anxiety to buy and store it when available, encouraged refrigeration and the purveying by hardware merchants of 'ice machines' and 'ice-safes'. Others were fundamental. When the lack of animals - oxen killed by Rinderpest, horses and mules by Horse Sickness, and donkeys by foot-rot - critically reduced transport and traction, mechanisation was forced upon all who could afford it. The extension of railways became vital. The bicycle business boomed. Electricity began to be applied to transport, particularly trams. The use of steam in industry was extended to agriculture.

To the 'backveld Boer' whose flocks and herds had been carefully increased over generations, the plough was of minor importance; but to the sophisticated farmers of mixed produce within reach of the omnivorous Witwatersrand, it was of the highest significance. As early as 1894, Samuel Marks, outstanding agricultural pioneer of the Transvaal, had imported two massive Fowler steam traction engines which, by means of hawsers drawing a plough back and forth, could furrow eight rows simultaneously. He used them on his Vereeniging farms to grow maize. It was a measure of the ravages of Rinderpest and the critical shortage of draught animals that in December 1896, Kruger turned his attention to this new source of agricultural power. At that time, his Government was advancing money for the purchase of tens of thousands of donkeys (at the preposterous price of £10-£12 a head - they brought their own diseases and later proliferated to the point of becoming vermin) and mules to maintain the country's economy. In devastated areas, it became commonplace to see a plough being drawn by a horse, a donkey and perhaps one surviving ox. Other teams were even more mixed.

At 6 a.m. on the 28th December 1896, His Honour and a large party of Government officials and English-speaking notabilities entrained in Pretoria for the 3½ hour journey to Vereeniging where carriages and carts awaited them to take them to one of Sammy Marks' innumerable farms an hour distant. They saw some of the operations of which the massive machines were capable - ploughing, harrowing and seeding - but not maize harvesting and bagging and other feasible phenomena.

Kruger regarded it with the closest attention, his perennial presidential opponent General Piet Joubert with him together with members of the Executive Council; the Surveyor-General Johann Rissik; Landdrost C. E. Schutte and Veldcornet Melt Marais of Pretoria; Hendrik Schoeman, a prominent farmer (and grandfather of a subsequent Minister of Agriculture); officers of the Staatsartillerie and others. 'It has been the intention of the Government for some time, in view of Rinderpest ravages, to introduce some steam-ploughs for the benefit of the farming community', Leo Weinthal wrote in his paper the next day. John Fowler & Co. were very aware of it and their representative Robinson had already sailed from England to exploit the Rinderpest situation generally. It was soon impinged on him. Travelling by cart through the Northern Cape, he was stopped at the Free State border and forced to carry his bags some distance across it to engage a local cart. The Free State was not admitting Cape infection. From Bloemfontein, he travelled to Pretoria and, expecting to be summoned at the routine hour around dawn, was accorded an unusual interview with the State President on a February afternoon in 1897.

7 'The President cross-examined me at some length with regard to the machinery turned out by my firm', Robinson reported. 'With him were six members of the Volksraad. My catalogue was handed to the President who appeared to express his satisfaction in short grunts and handed the catalogue round to each member present when the next page was opened. Evidently the members of the Raad present were farmers for they were much taken with the steam plough. They considered this to be the nearest approach to their ox-drawn ploughs. In fact, the President gave me a verbal order to send such a steam plough for his own use.' The news was published that Robinson's local agents, 'Messrs Reunert & Lenz have been favoured with an order from the State President for a Fowler steam plough'; but Kruger's progressive impulse was at that moment stilled by hope that the wizard at Kimberley had waved his wand (or his 'French savants' would wave their's) and abolished Rinderpest. The verbal order was not confirmed.

8 The worst effects of the continuing epidemic were human. The areas which bore the first vicious brunt before fences and puny regulations were imposed were Bechuanaland, the Protectorate and the Northern Cape. Of their large cattle population, the Mafeking district was left with 2,7% and Vryburg with 7,2%. The lack of cattle and game to eat the grass caused the veld to become rank and unsuitable for small stock. 'In some places not 30 miles from Vryburg',
9 the local magistrate reported, 'it is possible to ride for an hour through the veld and not see the spoor of a living animal - ox, cow or calf; horse, mule or sheep, goat or pig. The grass stands thick and high.' Khama's people in the Protectorate lost everything and like other natives elsewhere, postponed death by starvation through eating caterpillars, bark, roots and long-
10 decayed corpses dug up in desperation. The missionaries testified to it. The cost of transport
11 had become prohibitive. Supposedly 'salted' oxen, originally £6 apiece, could now hardly be had at £60. The stock farmers and transport riders, as Theiler had foreseen, became indigents.
12 The natives (wilfully murdered, as they saw it, by the white men shooting their healthy cattle) revolted in several places and in 1896/97, a 'war' broke out in the Protectorate with casualties on both sides. Distrust and intransigence long continued.

13 No 'wars' broke out in the northern and bushveld Transvaal which bore the first brunt with its western neighbours. The vials of evil abased the whole population, white and black. Not an ox was left in the Zoutpansberg and hardly a horse owing to the Sickness. Thrown back on their land, the natives cultivated their cereal crops which were totally destroyed by drought and locusts. Starvation resulted in 'lawlessness' and thievery. Thousands died and the sources of labour diminished with crippling effect on industry.

14 The condition of the whites was no better. Nearly a million beasts or more than two thirds
15 of the cattle population of the Transvaal ultimately died from Rinderpest. The wild animals too which might have been shot for food, were likewise destroyed and with them, the tsetse flies. The Uitlander farmers turned to store-keeping and transport riding with donkeys. The Afrikaner stockmen, used in times of adversity to turning to their richer brethren and becoming
16 bijwoners or quasi-tenants of small plots on their lands, now had no source of help and drifted as 'Arme Blankes' or poor whites to the towns. Churchmen spoke piteously of all. White men
17 in the north asked to be goaled for the sake of food. Natives ate disinterred carcasses buried many months before and, as manna from Heaven, the locusts which came in dense swarms.
18 Many were too weak to gather them. A relief Fund was privately started. Kruger received a deputation asking for action in relieving the famine in the north and assured its members that everything possible was being done. Totally insufficient supplies of maize were sent and shamefully exploited. Donkeys, too feeble to haul the loads drawn by horses, mules and oxen,
19 were supplied at cost on long-term repayment rarely rendered. A powerful and heartrending appeal, headed by the Dutch Reformed Church dominee, came from every denomination in

the Zoutpansberg, pleading for help for white and black, soon to be afflicted further by a lethal outbreak of malaria.

While Rinderpest continued to have its way throughout the land, the morale of the people was progressively broken. 'Nature' in drought and disease, pestilence and plague, combined with the 'scourge' to defeat the spirit of 'Man'. Only 'Science' could arrest the eroding process.

20 The Z.A.R. Government poured money into the grasping hands of its 'French experts'.
21 Danysz had decided that their laboratory should be at Waterval, two hours ride northward from Pretoria. They required large numbers of salted and unsalted animals of all kinds. Theiler
22 caused his experimental oxen to be brought from Marico, further embarrassing Pitchford who loyally continued to send the results of their joint experiments to his shanghaied friend. Buildings had to be erected, camps fenced, fodder supplied and a disinfection unit built. The research
23 team was accommodated in 'Eberhard's Hotel', a tin building 400 yards distant, Mr Eberhard taking a lively interest in the proceedings (he died of jaundice in February 1899). Theiler pro-
24 fessed himself pleased to have 'the opportunity to learn much about Bacteriology from these men which is not to be derived from bacteriological books'. He knew more than they about Rinderpest but could learn from their techniques. On the 15th February 1897, they began work on the lines Theiler and Pitchford had been pursuing, aware from Koch's Report of the 31st January that he had failed to isolate 'the fatal bacillus' and was conducting controlled investigations.

In a position of maddening frustration, Theiler was very careful, very correct, having decided that he would better prosper his cause by coöperating than obstructing. His command of French was invaluable to his two colleagues, inexperienced in sub-tropical conditions and diseases. Jean Danysz was a venal, managing and uncongenial man; but Theiler took to Jules Bordet, three years his junior. Bordet had scientific integrity. Danysz had other ends in view. They repeated Theiler's Marico experiments under his tutelage with inevitably the same result, having
25 the grace to admit that they had not expected to find in South Africa a veterinary bacteriologist of his quality. In a servile situation rendered tolerable by being able to go home for weekends (tied to the house and children, Emma was denied even the respite of a visit to Pretoria for six months at a stretch), Theiler found self-expression in writing an account of 'Rinderpest in Sudafrica' which Zschokke published in the *Schweizer Archiv for Tierheilkunde*. He had also entered into fascinating communication with Surgeon-Major David Bruce.

Bruce was still at Ubombo studying the trypanosomes of Nagana which rivalled Rinderpest in destroying stock. It is possible that he occasionally came to Pietermaritzburg to inform Sir Walter Hely-Hutchinson of his progress and to confer with the new P. V. S. Watkins-Pitchford. These discussions resulted in Sir Walter's writing to the new British Agent in Pretoria, Conynham Greene, requesting that the Z.A.R. collaborate with Natal in a joint attack on Nagana.
26 On the 14th February 1897, the Z.A.R. pronounced itself unable to comply and (doubtless with some satisfaction) gave as the reason that it was already employing two French experts and was unwilling to incur further costs. Theiler however maintained the connection on his own and
27 corresponded with Bruce who sent him smears in which he saw 'the protozoa-like little fishes' devouring the red corpuscles. They inspired interesting hypotheses in his fertile mind and he sent some dogs to Natal to be infected by them.

Periodical reports came from Koch dutifully detailing his investigations along known lines. Like Theiler and Pitchford, he had achieved only 'passive' or short-term immunity with serum from a recovered ox. He was experimenting widely with sheep, goats, camels and all kinds of
28 birds. In a coup de théâtre on the 10th February 1897, he announced the long-awaited lasting preventive and became the hero of the whole sub-continent. Theiler and Pitchford, saying nothing about it, had tried to make their anti-Rinderpest serum 'active' by subsequently

injecting the blood of an infected animal. Koch injected bile. In some mysterious way, the bile of a beast dying of Rinderpest was anti-toxic and conferred immunity when additionally injected.

29 Regardless of record, controversy on the nature of his discovery never ended. It was alleged to be entirely accidental – a happy fluke. Scoffing soon reach the point when Turner, Koch's friend and collaborator and cognisant of the thoroughness of his work, asked him pointblank whether it had been so. Koch answered – 'I was testing the virulence of the various fluids of the body and, amongst others, used gall from an animal dead of Rinderpest, fully expecting that it would communicate the disease. I injected 10 cc. into an animal which was none the worse for the experiment; on the contrary, when it was subsequently injected with Rinderpest, it resisted its action. I immediately tested the bile on six animals and obtained a similar result.' In a letter to Kolle, he confided that he had had more luck than he had ever expected. The fortifying of an immunising serum with a subsequent injection of virulent blood was orthodox serum therapy (as most bacteriologists and Theiler and Pitchford knew); but 'quite new and having no connection with serum-therapy is the new method discovered by me'.

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31 Theiler all but wept. 'Koch's discovery is the same as mine', he wrote, 'with this difference that he at once announced it while I wanted to await the result of further experiments. I have committed the grossest stupidity in not publishing the matter while Koch has concerned himself with ensuring that within a few days, the whole world knows.' The basis of Koch's 'discovery' remained the initial serum injection. Theiler was sceptical of the abracadabra of bile. Its 'microbes' might produce results other than enhanced immunity. 'I therefore think', he said presciently, 'that Koch has been rash in making common property of his first favourable results before he had proof that it could be repeated wholesale.' Later he explained how Pitchford and he had set up an experiment 'to inoculate an animal with 10 cc. of blood, serum and gall' but no animals were then available and when they were, 'we completely forgot to inoculate with gall which we had found to be so swarming with bacteria that we simply did not believe in success – and now, there it is!' Pitchford in Natal was equally chagrined and planned to advance his claim to the earlier discovery.

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The implications of Koch's announcement were fundamental. Fences, slaughtering, quarantining, disinfection stations were now redundant. The Z.A.R.'s expansive gesture in importing Danysz and Bordet became a costly farce. Genius had triumphed. All Koch had to do was to teach inoculators how to administer his method. A demonstration was arranged in Kimberley for the 24th February.

33 Theiler and Bordet were summoned to the State Secretary's office to discuss the new situation and the constitution of the Transvaal's delegation. It consisted of Theiler; Bordet, Dr J. L. Laxton, surgeon to the Staatsartillerie; Douw du Plessis, Rinderpest Commissioner; Commandant D. J. E. Erasmus and Mr Piet Kruger, eldest son of the State President. For the first time, 'amateurs' were invited to join the delegation – Dr J. W. Stroud, a versatile dental practitioner who had vociferously promoted inoculation in the Press; and, significantly, three representatives of the Pretoria Agricultural Society – E. P. A. Meintjes, a miller, extensive landowner and member of the Second Volksraad; J. J. Enschede, a progressive farmer; and Michal Erasmus. They left by train for Kimberley on the 21st February and put up at the Central Hotel. At other hotels were the Cape's Secretary for Agriculture, Pieter Faure; Free State delegates and numerous military veterinary surgeons from Natal.

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37 Despite his chagrin. Theiler was 'on all hands glad to be able to get to know this man person-

38 ally who is one of the chief founders of Bacteriology and one of the greatest authorities'. Koch was charming. Assisted by Kohlstock, he demonstrated every phase of his preventive method with animals in all stages. Theiler asked one question – would he recommend the double inoculation widespread? Koch said – No, only where the disease had appeared. Pieter Faure purred.
39 The tough Boer delegates were convinced. D. J. E. Erasmus made straight for the Post Office on the same afternoon and telegraphed the Z.A.R. Government that his delegation had met Koch with most satisfactory results and was returning forthwith but a cable must immediately be sent ordering 500 small syringes from Europe. Typically Theiler dashed off to visit the mines
40 and 'observe how the diamonds were extracted from the washed gravel' before the train left on the same night. The Transvaal delegation was back in Pretoria on the 26th February, its amateur members (particularly E. P. A. Meintjes who had wired the Agricultural Society from Kimberley) full of enthusiasm and ready to inoculate any amount of cattle with 'Koch's method'.

There were several impediments. 'Salted' oxen from which to produce the serum were rare.
41 Victims did not die conveniently at hand so that their galls – 'they must be green and not yellow or brown or putrescent', Koch had firmly stated – might be extracted for further inoculation.
42 Worse, there were no syringes. The Cape, in lesser need, gave 35 to the Transvaal. A few others
43 were found elsewhere. Delfos Brothers in Pretoria frantically tried to manufacture them. Mr
44 John Katz, a watchmaker-jeweller in Johannesburg, rode round the town on his bicycle buying every bicycle pump he could find. Tinkering them into practicable form as syringes, he took them to his friend Mr Ernest Collins of the silver-platers, List Bros. ('practical working jewellers – art workers in gold and silver') and, duly embellished with silver plating, they were sold to meet the crisis. There were other difficulties and a restive dissatisfied atmosphere began to arise. The finale came when Koch suddenly left.

Probably playing power politics and wishing to ingratiate himself with his grandmother (whom he had deeply offended by his Jameson Raid cable to Kruger), the Kaiser ordered Koch to leave without delay for India. The British Raj had failed to control an outbreak of bubonic plague. Koch was to go immediately to Bombay to wave his wand again. He was not unduly perturbed. His formula for preventing Rinderpest was safely in the hands of Kohlstock at Kimberley. The Cape Government had already sent Turner to learn the techniques from the master personally and he would take command of the Inoculation Station when Kohlstock left in June
45 and Kolle came from Germany to replace him. (He had accepted Koch's suggestion that he take the Robben Island appointment and te Water, the Colonial Secretary, had formally offered it to him on Koch's recommendation but in fact he went to Kimberley.) Lacking the
46 time even to make his farewells at the Cape, Koch left Kimberley at the end of March via Johannesburg to take ship at Durban. Inevitably, in growing disillusion, it was widely bruited
47 that he had departed before his 'method' was fully proved. The Z.A.R. Government's share of the cost of his four month visit was £1,826.18s.2d.

These catalytic events and particularly his meeting with the great man in Kimberley at his moment of triumph, produced in Theiler the usual symptoms of euphoria. 'The next result for the Transvaal must be a huge Bacteriological Institute of which I very much hope to be the
48 Director', he wrote, 'the two bacteriologists of the Pasteur Institute have assured me that they would recommend me to the Government for, as they say, they could hardly find a better person qualified in equal measure in Veterinary Science and Bacteriology. A fine compliment and also a splendid prospect!' His mood was not long sustained. Danysz was driving a hard bargain with
49 the Government to continue their work for a year, primarily in perfecting their own preventive against Rinderpest and secondly in investigating Horse Sickness. Neither fish, flesh nor fowl in the arrangement, Theiler 'helped' them, never indicating how much it went against the grain.

50 Theiler and Edington knew more about Horse Sickness than anyone ever had. Theiler was confident he would find an inoculation but felt compelled to share his knowledge with 'the French experts' – 'I help them as much as I can. I should have liked to conclude this study by myself but find collaboration wiser and more efficient.' Only his long-term aim of appointment as director of a State Research Institute could justify his sacrifice.

51 At Waterval, the team mounted new experiments designed to derive a feasible inoculation against Horse Sickness. Against their will, the Frenchmen pursued Theiler's thesis that lasting immunity from Rinderpest could be achieved only with a serum and a subsequent injection of virulent blood. 'They made a mock of me until they learnt for themselves that it was so,' he wrote. He had himself successfully injected 1,000 cattle with 'Koch's method'; but throughout the sub-continent, there were cries of rage that it conferred no lasting immunity and worse, it gave the disease to healthy beasts and even produced others. Hutcheon, now staffed with 28 veterinary surgeons to combat the epidemic, sent 10 to Kimberley to learn the 'method' from 52 Kohlstock and Turner. Edington at his outstation at Taungs (later elsewhere) and at his laboratory in Graham's Town, laboured to improve on it and felt convinced that he had evolved three forms that would circumvent the dangers.

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53 So far from salvation having reached the Transvaal, worse evils came upon it. The donkeys – last bulwark against destitution – succumbed to footrot (Theiler and 'the French experts' notwithstanding) and in many areas, transport completely ceased. Anthrax appeared among mules. In the lowveld, whites and natives died in hundreds from a particularly virulent form of malaria. Johannesburg, the country's economic hope, sank into even worse slump than the post-Raid crash. Unemployment and complete destitution ensued. Going to Johannesburg to buy 54 horses for the Waterval experiments, Theiler found that his prosperous electrician friend, Ernst Lauber, had died suddenly of pneumonia and felt compelled to offer refuge and employment to his widow and two children.

Ominous moves menaced the State itself. British regiments continued to be landed at the Cape and Natal. The dodderly Sir Hercules Robinson, now Lord Rosmead, was replaced as High Commissioner for South Africa by the forceful Sir Alfred Milner. Kruger shook the quasi-democratic structure of his country by challenging his Chief Justice and maintaining that the State was above the Law. The ubiquitous Rinderpest crept insidiously onward throughout South Africa and particularly the Transvaal and was nowhere defeated. Protests and lamentations filled the entire land and the name of Koch was dragged through the mud. Sweltering 55 in Bombay, Koch heard from Kohlstock and was exceeding wrath, accusing the Cape Government officials of ignoring his technical instructions. Soon he would be back in Africa, the Kaiser 56 having ordered him to Tanganyika to investigate Malaria and Redwater (Texas Fever), then preventing exploitation of the uplands.

Theiler's precipitate translation from Marico to Waterval, leaving the layman Clarens in charge of experiments, and the hullabaloo of Koch's 'discovery' had not disturbed his faith in the line which he and Pitchford had been pursuing. He had been stopped in mid-course and it needed only to persuade the Frenchmen of the validity of his case to get on with it. Lacking a 57 line of their own, they were complaisant and sought the aid of the Z.A.R. Government in providing the most difficult requirement – a number of 'salted' oxen. Both the Government and neighbouring progressive farmers were consistently coöperative and the team was able to pursue an exceptionally wide series of tedious tests on the best conditions under which infected blood could be injected into animals, fortified by serum from 'salted' oxen, to obtain lengthy immun-

ity. Advantage could be gained from determining the correct dosage, the exact number of days intervening on dosing and exposure to infection, and a score of other points on which Theiler and Pitchford had been deprived of assuring themselves.

What emerged was a radical departure from accepted seratherapeutic theory. You bled a salted ox. Then you whisked the blood with a wire brush round a sterilised dish until it was defibrinated (the fibrin or protein material separated and sank, leaving a clear fluid). You injected a specific amount of this into a healthy animal and immediately exposed it for several days to active infection from Rinderpest victims in a kraal or enclosure, or by smearing their body material into its nostrils. Five or six days, later when the fever symptomatic of the disease usually developed, you gave it another injection of defibrinated blood. With numerous experiments on local farms, the team had assured itself of the lasting efficacy of this immunising treatment. Mortality was only 15%. Mortality from the disease was about 90%. They reported their finding to Landdrost Schutte.

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59 In the terms of a Government instruction to appoint an examining committee, he came to
60 Waterval early in May to see for himself. The imposing grey-bearded Landdrost of Pretoria, just turned 50 but resembling a Biblical patriarch, was impressed. He called for a written report. The team submitted it on the 21st May under their three signatures. Theiler allowed himself some mild triumph. 'I have felt satisfaction', he wrote his parents, 'that the method which Pitchford and I worked out is at length coming into use and, as it seems, with very good results . . . I was the first to discover that serum does not protect against natural infection but does against infection with virulent blood. That is a phenomenon unobserved up to now . . .' To ensure that the double-injection of defibrinated blood in an animal wilfully exposed to Rinderpest infection really did immunise it, Schutte appointed himself chairman and secretary of a committee consisting of Commandant D. J. E. Erasmus, Douw du Plessis and the Landdrosts of the Witwatersrand, Aapies River and Derdepoort (both Pretoria) areas. As an officious Belgian doctor in Pretoria, Dr de Coninck had 'leaked' information on the new technique (to the annoyance of the team), there was keen anticipation and much dispute among the local
61 medical wiseacres such as Knobel, Stroud and de Coninck. Knobel was not wanting in praise in letters to the Press for his friend of six years' standing, 'Dr' Theiler.

By now, 'Koch's method' was widely discredited. While he was still in the country, the
65 Afrikaner Bond (a widespread but reactionary political body in the Cape Colony) defeated a motion of gratitude to him and went on to recommend the abolition of the Colonial Veterinary
66 Department. As Rinderpest swept deeper and hardly hindered into the Free State and Cape Colony, animus intensified and with it, the first factionalising. Turner and Kohlstock were Koch men. Hutcheon became an Edington man. Henning in the Free State remained a Koch man. Pitchford was a Pitchford man propounding a yet-unproved technique (Natal was still not badly affected). Few knew of developments in the north and the prospect of becoming a French man.

The Committee went about its lengthy business of testing the claims of the Waterval team which, owing to the leakage of information on their 'preventive', they immediately put into practice. 'The Boers don't want any more to do with Dr Koch's gall inoculation and grab at
67 our inoculation', Theiler jubilantly reported in one of his euphoric states arising from Knobel's public plaudits, 'I exerted myself to show people that in the job of Government Vet, I was no mere pill-pedlar . . . Now there will probably be a small war over the question who deserves the credit for first discovering this inoculation method. Qui vivra verra! Pitchford naturally defends his claims. I must be quiet and content with the fame which has fallen to the two Pasteur men. I think it pays me better and all will come right in the end.'

The Committee satisfactorily completed its work and on the 18th June 1897, the three scien-

68 tists presented their remarkable Report (covering 15th February–15th June) to the Z.A.R. Government. It dealt handsomely with the Theiler/Pitchford pioneering work on which the Waterval studies were based. Its most remarkable feature outside the exposition of the new technique and its success in the field witnessed by the Committee, was its urgent request to the Government to stage an ‘International Conference’ for the purpose of finally extirpating Rinderpest which otherwise might linger perpetually in Africa. The Government acted with
 69 praiseworthy speed and took four notable decisions – to publish the Report (its rapid appearance in Dutch only with limited distribution for a long time prevented a large number of influential persons, particularly Hutcheon, from appreciating its significance; unlike Pitchford and Hutcheon with their Colonial *Agricultural Journals*, Theiler had no means of publishing his work except in Switzerland); to provide at once the means of implementing the new method against Rinderpest; to equip Danysz and Bordet with 6 assistants to learn and propagate the method; and to organise without delay an ‘International Conference’ from the 2nd to the 13th August. It may be supposed that in addition to its altruistic motive, the Z.A.R. Government was anxious to vaunt its triumph over its Colonial rivals in the Rinderpest campaign.

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70 At that time, xenophobia reached extraordinary heights locally and abroad, particularly in bald-headed attacks on the Cape’s employment of Koch. Feeling against ‘the German adviser’ was vitriolic throughout South Africa. Farmers whose healthy cattle had died by his ‘immunising means’ could hardly be silent. In vain did Turner and Kohlstock protest that the beasts were probably in the first stages of the disease when injected or the victims of ‘vengeance infection’ or unhygienically inoculated or poisoned by putrescent bile. The outcry continued, powerfully stimulated by prodigious efforts throughout the Colonies and indeed in the two Republics themselves, to celebrate ‘the Queen’s Record Reign’ in unprecedented manner.

71 It was widely mooted that the Z.A.R. was run by ‘foreigners’ and although the earlier antipathy against the preponderance of Hollanders in high positions had somewhat subsided, it behoved *The Press* early in July 1897 to publish the incidence of exotics in the Transvaal Civil Service (gladly supplied by the Acting State Secretary, C. van Boeschoten).

Born in Holland	– 306
England	– 107
Germany	– 66
France	– 6
Other European States	– 17
Other parts of the World	– 4
	506

The exotics, it was established, were heavily out-numbered by locals:

Born in the Republic	– 682
Cape Colony	– 478
Orange Free State	– 105
Natal	– 42
Other parts of South Africa	– 145
	1,452

72 Nonetheless, when the Pretoria newspapers continued their prolonged and vain pleas for a Department of Agriculture, it was pointedly said 'We do not want a Department of imported savants, men who would be content to sit in their offices or at most busy themselves in a laboratory and issue instructions that would not be understood by the people . . .'

73 This widespread popular hysteria was the probable cause of Theiler's playing a very careful hand. He was acutely aware of it as well as his current status as a 'horse doctor' and not a qualified bacteriologist in the sense of 'the French savants'. Even more insistently than in the past, he bombarded his father with requests to forward all his old textbooks and to order the latest works on Bacteriology, Geology, Astronomy and scientific advance, especially in French. A tireless and omnivorous student, he was determined to emerge from the Rinderpest imbroglio as a research scientist, a veterinary bacteriologist – certainly not a veterinary surgeon.

74 Bedevilled though it were by political, economic and financial difficulties and a forthcoming presidential election, the Z.A.R. Government removed every impediment to the successful staging of the Conference. Funds and facilities were made available in abundance to Jean Danysz, more entrepreneur than scientist, and he organised an occasion in keeping with the best examples overseas. There were towering hindrances. The Conference would be quadrilingual (Dutch, French, German and English) and, without any mechanical aid, must be made simultaneously intelligible to all delegates. Dutch would be the official language but interpreters would translate the speeches as they were made. Papers and minutes would be manually recorded, translated overnight and placed on delegates' desks the next morning. There would be fights – political acerbities between Colonial powers and republican representatives, and violent disagreement among the scientists. The Executive Council gave very careful thought to formalities, agenda and procedure. All were rigorously specified. Dr W. J. Leyds had again gone to Europe but the Acting State Secretary C. van Boeschoten would formally open the Conference. The chairman would be the imposing Landdrost C. E. Schutte who would welcome the delegates in a strictly factual speech detailing the reasons that brought them together.

76 In the six weeks that elapsed between the Government's decision and the opening of the Conference on the 2nd August, Rinderpest suddenly flared into raging life and blazed into Natal and through the whole Cape Colony down to the sea. Nothing stopped it. Cattle died in tens of thousands and the money poured like water into 'defences' was utterly wasted. Hutcheon and his large team, operating with Edington's new 'glycerinated bile', inoculated all they could. Pitchford, much less equipped, used his own version of his 'discovery' and saw one district after another succumb.

77 In the Transvaal, energetic activity quite foreign to the overseas conception of 'the Boers', was everywhere manifest. Danysz, Bordet and Theiler's Report, printed and circulated in Dutch, was now published in English in the Pretoria *Press*. The instructions for the new method were also printed in Dutch. Invitations to the Conference were telegraphed to all Governments, 78 followed by copies of the Report by post. An Information Centre was opened in Pretoria where Theiler's compatriot, Ernst Ruegg expounded 'the French method'. A conference of Veldcornets 79 from the whole Transvaal was summoned to learn about it. In the absence of the State President at a secret session of the Second Volksraad, the Vice-President (and a presidential candidate) General Schalk Burger took the chair. The unilingual Danysz could not read his Report but Theiler spoke for him and the following day (27th July) gave a demonstration to the Veldcornets (who were expected to operate the procedure in their districts) on 70 cattle on the State President's nearby farm on the Wonderboom road. An interested spectator was Commandant- 80 General Piet Joubert, also a candidate. Kruger, having dismissed incense bark and podopyllin, 81 had provided powerful argument in favour of Science. At the same time, the Executive Council resolved to continue to subsidise Danysz and Bordet to the amount of £14,991 in periodic

82 advances for the purpose of finding a specific against Horse Sickness. Theiler's friends in the Press used it all to continue their campaign for a Z.A.R. Department of Agriculture with its own veterinary scientists and no need to import expensive experts from overseas.

83 Some delegates (all guests of the Government) arrived early. Among them was Turner, now highly expert after coöperation with Kohlstock (who had gone to German South West Africa to defend it against Rinderpest with 'Koch's method') and the amiable young Kolle at Kimberley. They had tried, like Theiler, to produce hyper-immunisation by injecting increasingly heavy doses of virulent blood into a 'salted' animal and thus deriving a particularly powerful serum. Turner, proficient in French, had hustled off to meet Danysz and Bordet and, hearing what they had to say, immediately telegraphed the Cape Government that 'the French method' was the best in certain circumstances but Koch's in others. The Cape delegation was listed to consist of Turner and Edington; but when the Conference opened, Turner stood alone. Edington was too busy producing 'glycerinated bile' for Hutcheon's enthusiastic use. Pitchford too was an absentee owing to the rapid invasion of Natal.

84 In Turner alone, the Conference had attracted explosive material but there were others who, but for the calm chairmanship of Schutte, might have defeated its purposes. The cross-currents were powerful and bitter. Natal was represented by its Commissioner of Agriculture, C. B. Lloyed and the brilliant British Army Veterinary-Captain A. J. Haslam with experience in India who spoke with brusquerie and point. Its delegation was accompanied by A. K. Murray of the Natal Farmers' Conference. The Free State sent its Rinderpest Commissioner T. Brain and its veterinary surgeon Otto Henning. The Portuguese possessions (Mocambique and Angola) were represented by the Mayor of Lourenço Marques, Dr Mario de Nascimento whose attendance was intermittent owing to attacks of malaria; and the German (South West Africa and Tanganyika) by the German Consul in Pretoria, F. von Herff. The Z.A.R. delegates, with Danysz and Bordet in attendance, were the Landdrost of Pretoria and Mr Theiler; but as Schutte was constantly in the chair, the onus fell on Theiler. The Pretoria Agricultural Society sent the respected F. T. Nicholson who shortly founded the Transvaal Agricultural Union. Various 85 accredited individuals such as Commandant D. J. E. Erasmus and E. P. A. Meintjes also intruded remarks. All the delegates were either passionate proponents of one 'method' or another or carried some sort of chip on their shoulder, mostly in the form of fanatical loyalty to some or other scientist. Strong political bias further distinguished them. The Conference Minutes, comically translated into English, hardly reflected the tensions.

86 Including the interpreters and general secretary, Dr Tresling, there were at no time more than 20 clamant gentlemen in the large room of the new Staats Gymnasium (college) where the Conference was held. The quadrilingual Theiler (who spoke a great deal) and the trilingual Turner greatly facilitated the deliberations and were later thanked. The atmosphere was one of close and combative intimacy. On the first working morning, Turner, Haslam and Henning established their varying expertise and Theiler read a paper on the history of the epidemic. In the afternoon, the delegates were taken to Waterval where Danysz and Bordet demonstrated 'the French method'. On the following day (4th August), Watkins-Pitchford made a surprising appearance, seeking permission to participate but not as a member of the Natal delegation. He did not speak. The day (and the night when Theiler took the chair) was devoted to a critical examination of 'Koch's method'. Turner vehemently defended Koch, particularly in point of his precipitate departure for India on orders from his Emperor, and read a long telegram from Edington extolling 'glycerinated bile'. No one paid attention. The Frenchmen moved that the bile method was dangerous and it were better to discuss the use of blood. Natal enthusiastically agreed. Rinderpest had begun to ravage their Colony and Lloyd, Murray and Pitchford were thereupon forced to depart from the Conference, leaving Haslam to represent them.

87 Lloyd left a dramatic document which was read the following day. It recapitulated the Z.A.R./ Natal enterprise at Marico in 1896/97 and concluded – ‘The Congress will observe that Drs Danysz and Bordet from the time of their arrival were placed in the favourable position of having at their disposal the result of four months’ continuous and successful labour conducted by Messrs Theiler and Pitchford. I have now read the Report which has been presented to the Conference by Drs Danysz and Bordet and so far as I can see, there is but little difference between the results communicated in that Report and those obtained by Messrs Theiler and Pitchford in 1896. The latter gentlemen obtained certain results but could not take advantage of them, Mr Theiler because he was recalled by his Government and Mr Pitchford because, up to the middle of June last, there was no Rinderpest in Natal. No doubt the Congress will appreciate the labour performed by each of the experts in the case of the sero-therapy of the Rinderpest in South Africa.’

88 There was more than met the eye in the simple statement (doubtless drafted by Pitchford).
89 There was the reward demanded by Danysz and Bordet from the Z.A.R. Government. There was the possibility of prizes. There were the million roubles offered by the Russian Government. Without doubt Watkins-Pitchford had planned the move and Theiler immediately and joyously qualified it at the Conference with circumspect reference to his French colleagues. He and Pitchford had indeed established the immunity conferred by the blood of ‘salted’ animals (as Semmer in Russia had done); but ‘several important points had to be correctly set forth. The merits connected with the method as at present applied, must no doubt be ascribed to the experimenters at Waterval.’

90 The Conference proceeded to discuss it and Theiler went home to write gleefully to his parents – ‘The two gentlemen from the Pasteur Institute did not express themselves honestly enough in regard to my previous co-worker and myself. I am now in a position to tell you that we today won a complete victory in that it was recognised by the Congress that Pitchford and I are the first experimenters to demonstrate the value of serum in combatting Rinderpest and clarified the way by which it should be done.’ Excited and stimulated as ever, he was full of the zest for work. Emma was eight months pregnant and overburdened by the responsibilities of her family and the problems of Frau Lauber; but there was peace at home (now accessible by the horse and cart on which they had spent their savings) and great prospect in the future.

91 Never more than the proverbial ‘talking shop’, the Conference gabbled on for another week in a rising temperature. Haslam was reactionary and didactic. Danysz, Bordet and Theiler pushed their method. Turner, Henning, von Herff and Brain promoted Koch’s. The great man was already on his way to Dar-es-Salaam to deal with Redwater and Malaria. When Kolle wrote him of the attacks, he replied with great fury, accusing the Cape Government of falling between the two stools of his method and the magic medium with which Edington and his supporters proposed banishing the disease without work or expense. At the Conference however, his proponents campaigned strenuously to restore his good name and, as tempers shortened, various ‘commotions’ occurred. National rivalries predominated even as, in the words of the chairman, Rinderpest was assuming ‘gigantic proportions’ throughout Southern Africa. Time ran out before the bickering became serious. It fell to Danysz to propose a course of action deriving from the discussions. Doubtless with an eye to his own occupation of the directorship, he suggested an International Experimental Station for Rinderpest and was roundly rebuffed by the delegates.

92 Votes of thanks were then proposed, Danysz delicately saluting the contribution of Koch.
93 Turner, oldest and most outspoken of the delegates, seconded his motion in terms typical of the times but unrecorded in the Minutes – ‘It is with much pleasure that I rise in seconding the proposition of my French colleagues. After all the misrepresentation and abuse from which Professor Koch has suffered, it is indeed pleasing to hear the value of his work frankly and ungrudg-

ingly recognised by those so well able to estimate its importance and especially by those who have also conferred an incalculable benefit to South Africa in demonstrating the use of defibrinated blood and in defining when and how it may usefully be employed. I cannot help contrasting the correct and manly conduct of the Frenchmen whose services the Transvaal has been fortunate enough to retain, with that of some of my countrymen in the Cape Colony apparently because Dr Koch happened to be a German. In fact this has been openly said. Those who were instrumental in calling him to our aid in our dire necessity, have been blamed. His successes were suppressed and repeated failures magnified and published industriously in the Press. Even suggesting that Science recognised nationality which it should not, it could be accounted Dr Koch's misfortune and not his fault that he was not born a subject of Her Gracious Majesty Queen Victoria and no man must be held responsible for a matter over which he has no possible control. We easily support those disadvantages of which we are not cognisant. Let us hope that Koch is yet mentally unaware of all he has lost by being born under the German Eagle rather than the British Lion. Not satisfied with belittling Koch's work, others have not hesitated to appropriate it in its entirety and to make capital out of it.'

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The cap closely fitted Edington. Turner departed and quarrelled seriously with Hutcheon and Edington, resulting in the Cape's simultaneously promoting 'the Koch method' and 'Edington's method'. Edington ultimately received many expressions of gratitude for having 'saved' the Eastern Cape. At Kimberley, the Victoria Compound now produced vast quantities of Koch/Kohlstock/Turner/Kolle specific which, Theiler was later to pronounce, 'did more harm than good'. The Conference could be said only to have established the validity of the 'German' and 'French' methods and to have publicised the scientific work of Danysz, Bordet and Theiler. Watkins-Pitchford was not prepared to let the matter rest there.

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In the meantime, Rinderpest ran its course until it reached the sea, costing the Cape £1,196,360 and 35% of its cattle; Natal a preliminary amount of £200,000; and incalculable amounts in the Transvaal and Free State. It had had the effect of propelling veterinary science into the forefront of public consciousness and the veterinary surgeon into reluctant acceptance by farmers at large. No one could count the moral damage it did to the people, black and white, in the areas of worst infestation.