Robert Koch, colonial medicine, global health – and us[1]

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Robert Koch, pioneer of medical bacteriology and of tropical medicine, has been considered an exemplary researcher for a long time. In the light of postcolonial critique, should we re-consider our evaluation, and can he still be held as a professional role model and even name patron of public health research institutes? Especially his work in tropical medicine requires us to take another look.

As his biographer, I know quite a lot about Robert Koch's (1843–1910) life and work. Thus, looking at his work in colonial medicine should be easy.[2] But there is an underlying question here, which is far more difficult. We have to ask it: How should we assess historical personalities in the first place, on which basis should we grant recognition from medical eponyms to naming institutes or even relate to them as examples for inspiration – embodying professional, cultural or political values that we would like to see expressed? In short: Whose values count in the evaluations, those of Koch's days, ours's, and if so, what should those be?

In the case of the 19th century German physician Robert Koch we are not the first to do an evaluation. To the contrary, through his work on pathogenic bacteria and the methods to study them he was much revered by his contemporaries. A whole little catalogue of eponymic expressions has survived to this day. Koch's bacillus, properly known as *Mycobacterium tuberculosis,* recalling his greatest discovery from 1882; Koch's postulates, embodying the methodological influence of his school; the Koch medal, if you win it, will line your pockets with 120.000 Euros. Finally, Koch serves

1 Based on a speech given to employees of the Robert Koch Institute Berlin, 14.10.2021

2 All quotes used in the following are drawn from a biography of Koch's I wrote: Gradmann C. *Laboratory Disease: Robert Koch's Medical Bacteriology*. Baltimore: Johns Hopkins University Press, 2009.

as a name patron of a national institute of public health, the Robert Koch Institute in Berlin.

Honoring and distinction have their downsides. If we deem certain lives exemplarily, they overshadow others, be it because they receive too little attention or if someone else's work is actually remembered under Koch's name – elevating one person at the expense of another.

Let me look at a seemingly inconspicuous example to discuss how this works and what it implies. Koch is commonly credited with having invented so-called solid culture media. They are quite important in cultivating bacteria and Koch's laboratory pioneered the use of *Agar-Agar.* Using it, you can solidify otherwise liquid media like broth. It was, however, the wife of one of his assistants, Fanny Hesse (1850–1934), who suggested to transfer this piece of household technology (comes in handy in baking) to the laboratory. Interestingly, while Koch himself never claimed that invention for himself, it is commonly treated as his.

It is easy to see this as a minute, irrelevant detail, but depending on the context we employ and the perspective we use, it can be quite fascinating. Looking at it, we can understand relations between the kitchen, the laboratory and gender in late 19th science, where collaborating spouses are surprisingly common, but seldom visible. Downplaying it, we are missing an important dimension of 19th century science. We also realize the problematic aspects of lionizing certain individuals – who then suck up other's lives in their biographies.

Judgments about the past, we understand, always include judgments about the present. When we find gender relations worth considering, Fanny Hesse becomes interesting. Otherwise, the agar story is a small detail, hardly changing what we think about the significance of Koch's bacteriology.

Also, we realize that when we speak of Koch, we tend to speak not of the *person* but of the *persona,* that is the public image of a historical figure. Typically, the work of a small army of professionals is condensed into just one name and what remains as a historical portrait is very dependent on what we, the observers, wish to express – be it praise or blame.

So, we should try to make a distinction between the person, the public image and the science; and we should reflect on the instance that judgments reflect our own points of view. This is our responsibility.

Koch and far-away countries

Koch was an enthusiastic traveller. As such, travelling was a traditional form of scientific work, but it increasingly changed form in the nineteenth century. The place of the versatile discoverers was gradually taken by specialized

researchers who expanded their expert knowledge through their travels and who often travelled on commissions. This development reflected the progressive specialization in the sciences, and it was part and parcel of colonisation. While the "Dark Africa" turned more and more exotic in the contemporary imagination, it was being colonized in practice and equipped with infrastructure that supported research and government such as railways or the telegraph. Colonial medicine was part of this enterprise.

There is certainly a colonial gaze in Koch's idea of Africa as an undisturbed place. For Koch this was true in several respects. He entered tropical medicine in the 1890s for many reasons. One of those was to escape from colleagues and critics at home of which he, as he saw it, had far too many in those days. Another, less obvious motivation was to escape from the consequences of the successes of hygiene and bacteriology. Europe had, in his eyes, been fundamentally altered in its epidemiology, so that the relations of men and microbes were becoming increasingly hard to study in this place. Tropical countries, instead, represented a kind of natural state of the relations of men and microbes. When in 1899 Koch studied malaria in New Guinea, the main attraction of the place, as he saw it, was that it offered conditions where it had not been influenced by medical intervention. This was particularly interesting, he thought. For Koch, New Guinea was a laboratory for the study of tropical infections: 'The malaria expedition was given an opportunity in New Guinea that has become rare today: To study malaria under circumstances where it can develop totally undisturbed'[3].

As far as malaria is concerned, whatever the inhabitants of the island did or thought, did not matter to Koch. It is almost as if the humans are counted as part of the nature studied.

The natural state presumption is widespread in Koch's papers and private communications. "Under the beautiful cover sleeps doom," he wrote in a letter to Georg Gaffky (1850–1918) from Lake Victoria 1906. Koch's enthusiasm for African nature obviously is reminiscent of the contemporary clichés that depicted "Black Africa" as a fascinating and dangerous place. As a physician, Koch could add specificity to this image. The characteristics of the Dark Continent that others viewed over the tabs of a gun were also visible, albeit in a different form, through the lens of a microscope. In Koch's case, these were images of a hidden and menacing nature. For all the beauty of nature, the bacteriologist uncovered innumerable dangers lurking under the surface:

3 Koch R., ‚Zusammenfassende Darstellung der Ergebnisse der Malariaexpedition', in Schwalbe J. (ed), *Gesammelte Werke von Robert Koch*, 2 vols., (Leipzig, Verlag von Georg Thieme, 1912 (1900)), vol. 2.1, pp. 422-34, p 422.

"Malaria, dysentery, recurrent fevers all of this is amply present here as almost nowhere else. The place is swarming with anopheles; even on my mountain we have them almost in pure culture," he wrote from his camp, providing a fine example of his perception of nature. An examination of his own rowers, "52 strong young men," had yielded the results he expected: "And by the way, of these 52 seemingly healthy young people, 47 had *Filaria perstans*, 26 had malaria parasites, and 2 recurrent fever spirillia in their blood. This is what the supposedly still healthy local population looks like."

Another motive shows the researcher as a child of his age: Koch, with all his passion for travelling, treated Africa as an infinite resource at his disposal. That goes for science and for private life and rather often, they are hard to distinguish. In a letter to Gaffky from October 1900, Koch wrote:

"At home [in Berlin] everything has been gone over so thoroughly that it really is no longer worthwhile to do research there. But out here the streets are still paved with the gold of science. How many new things did I see and learn when I first came to Africa!"

That nature is a source of dirt, danger, and above all disease was a fundamental conviction of Koch's. Africa was the apotheosis of all this – a repulsive yet fascinating subject. The fundamentals of the orderly microscopic world, which the bacteriologist imagined, thus reappeared in the macroscopic world of Africa where nature had not yet been tamed by civilization and hygiene. Never did he question the need to colonize, civilize and rule this place.

There is, we realize, more than just a pinch of colonialism in the relations of men and microbe as they were imagined by Koch and his audiences. Instead relations of men and microbes are portrayed against a backdrop of exotic nature and colonial politics. They can serve as a justification of the latter. Tropical nature, for all its fascination, is in need of conquest.

Dangers from afar

It is important to move beyond this personal level and to look at the involvement of bacteriological hygiene with colonialism at large. In that case, we can think of the ensuing changes in industrialized countries' epidemiology that happened as Koch's career progressed. Bacteriology promised a victory over infectious diseases and even though it could offer but little in terms of specific cures in the late 19th century, many of the conditions it studied were obviously in retreat.

This process, we know it as epidemiological transition, had an interesting side effect: as epidemics disappeared from industrialized countries, they were

increasingly perceived as threats from afar. The best way to discuss this is through the example of cholera:[4] Until the early 19th century, cholera was a collective term for all sorts of gastrointestinal diseases. As a result of the pandemic spread of one of those around 1820, the term *cholera asiatica* came into being, which differed from the well-known *cholera nostras* [our cholera]. Cholera asiatica then threatened the world in repeated epidemics, originating from the Bay of Bengal. With the accent on the place of origin, Bengal, the term provides an image of the threat to Europe from afar – and at the same time a handy justification of colonial rule as the protection of Europe and the spread of hygienic civilization. Thus, when Koch wrote his report about a cholera expedition of 1883/84, the one where he identified the bacterium causing cholera, he deemed it appropriate to furnish the report of his experiments with a reflection on the natural history of the condition.

"Lush vegetation and a rich fauna have developed in this area of the world, which, inaccessible to humans not only because of frequent flooding and the presence of many tigers, is above all avoided because of the pernicious fevers [...] It will be easy to understand that here microorganisms have a better chance to develop than almost anywhere else on earth [...] Under peculiar conditions a very peculiar fauna and flora is bound to develop, and in all probability the cholera bacillus is part of it."[5]

The passage serves to amplify the "Asian-ness" of Asiatic cholera. Written into a scientific paper, it became a popular text, reprinted in popular magazines with little changes. There is a lot missing in such notions on cholera's origins: The fact that intensifying trade favored the spread and that cholera by no means threatened only Europe but also Africa is obscured in the term. Instead, the term Asiatic cholera started a blame game that we are all seem too familiar with: a world of imagination in which at the outset of all chains of infection we tend to find a small brown man – a thoroughly stigmatizing description that at the same time provides the self-portrait of a Europe which is threatened from afar but holds the key to the solution.

A variation of it was given upon the honorary banquet held for Koch and his team when they returned to Berlin in 1884. First port of call during the expedition had been Egypt. Koch had in his report described the country as "very rich in parasitical and infectious diseases". The cover of the menu of the banquet delivers this as a juxtaposition of ancient Egypt culture, salvaged from disease by modern science (Figure 1).

4 Hamlin Cr. *Cholera: The Biography*. Oxford: Oxford University Press, 2009.

5 Koch R., ‚Erste Konferenz zur Erörterung der Cholerafrage', in Schwalbe J.(ed, *Gesammelte Werke von Robert Koch*, 2 vols., (Leipzig, Verlag von Georg Thieme, 1912 (1884)), vol. 2.1, pp. 20-60, p. 36/37.

Figure 1. Menu of the honorary banquet for the Cholera expedition, May 1884, (Robert Koch institute, RKI)

Egypt is naively portrayed as the land of pharaohs, modern science is present with microscopes, laboratory animals and of course, Koch himself. All this is spiced up with epidemic paraphernalia such as angels of mercy, dying victims and so forth.

Embedded into this world view is a presumption of the superiority of European science. It even holds when it is obviously disproven: Thus when Cholera broke out in Hamburg in 1892, Koch is said to have commented, "Gentlemen, I forget that I am in Europe," while inspecting the city's sewers.

Sleeping sickness

There are, of course, some questions to be discussed in Koch's career. His conduct of medicine at times seems quite objectionable to an early 21st century observer. Specifically, we need to look at his involvement in control campaigns for sleeping sickness right after the year 1900. This condition was ravaging East Africa in what was called the so-called Uganda epidemic. Contemporary campaigns for the control of sleeping sickness were notorious for their brutal application of ineffective treatments, their systematic

suppression of local populations, while at the same time supplying colonial occupation with a medical-humanitarian gloss over.[6]

Koch himself went on several research expeditions to Africa. One of these in 1906/07 came to be focused on the treatment of sleeping sickness. When summarizing his work in a report to the Imperial Government, Koch considered future control campaigns. If deemed necessary, he advocated the isolation of sufferers in camps for compulsory treatment. In doing so, he drew some linguistic inspiration from camps for civilians the British had run during the Boer war, calling them *Konzentrationslager* – concentration camps. The terminology was probably accurate in a technical sense, relating to the compulsory isolation of civilians, but in hindsight of further histories a disastrous choice.

Koch's entanglement into the sleeping sickness control campaign triggered a debate whereas in the documented presence of several treatment camps before World War 1, where armed guards and barbed wire were standard practice, did this not make Robert Koch untenable as a name patron of a 21st century national institute of public health?

Before I try to offer you my opinion on the matter, I would like to point your attention to the effect that what worked to elevate Koch's persona when it came to agar-agar, now works against him: Much as he got credit for a lot of lab gadgets he has not invented, he is now was criticized for sleeping sickness treatment camps he had had little to do with. Of course, he authored the report that recommended to have camps in the first place, but he did not suggest the military style in which the control of sleeping sickness became conducted later.

In fact, in his own camp, which he ran on group of islands in Lake Victoria (before writing the report), patients were free to enter and leave as they wished. To some degree, it had to be that way. Being outside of German East Africa, he could not have used German military but I do think his British hosts in nearby Entebbe would have been happy to send some guards. Yet, he did not inquire for that it seems. The treatment he used was lacking efficacy and had serious side effects. In this case, it seems fair to conclude that, also by contemporary standards, its application should have been stopped earlier and that it was ambition that brought him to hang on to it.

Koch and his patients

Generally speaking, Koch was less interested in people than in their infections. He showed little empathy in any of his patients individually, but this

6 Read on this in: Ehlers S. *Europa und die Schlafkrankheit: Koloniale Seuchenbekämpfung, Europäische Identitäten undmModerne Medizin 1890-1950*. Göttingen: Vandenhoeck & Ruprecht, 2019.

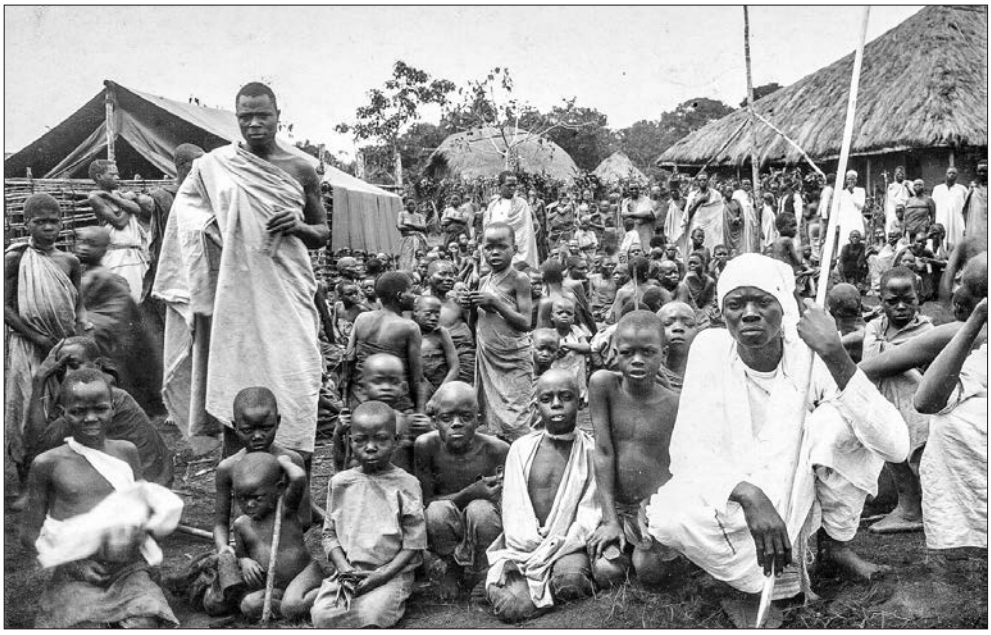

Figure 2. Koch's camp on Sese. «Sick people outside of the treatment room». (Robert Koch Institute)

also went for those he treated in Europe. Patients in Koch's camp on the Sese islands on Lake Victoria exercised what was arguably pretty much the only substantial patient right in those days, refusal to be treated. In their case, they did so by running away, which they did in masses.

Koch also certainly never questioned colonial conquest and domination as such. To the contrary he was on close terms with relevant people and organizations, not the least to get his travels funded. The plans he drafted for combating sleeping sickness breathe an unquestioned support for the notion that colonies and their population could be economically exploited by Germany. But neither did he see himself as a member of some kind of master race: Privately, he learned Swahili to be able to talk to the islands inhabitants. Without much hesitation he fired a member of his team because this man's snappy military-style demeanor alienated locals. But still, his interest in the locals was very limited. He was, remember my comment above on scientific travelling, a travelling expert. He showed no interest in what the locals thought about sleeping sickness.[7] He was oblivious or ignorant to the affairs of the colony he worked in and did not mention the

7 In fact, that would have been worth the endeavour: Webel MK. *The Politics of Disease Control: Sleeping Sickness in Eastern Africa, 1890-1920*. Athens: Ohio University Press, 2019.

instance that during his stay in Tanganyika, a brutal war between colonizers and colonized, known as Maji-Maji rebellion took place.[8]

However, and most importantly, he showed no interest of putting into practice any of the suggestions laid out in his 1907 report. To the contrary, when returning from his sleeping sickness expedition, he was frustrated with its achievements, not the least regarding his own abandoned treatment campaign. In fact, it was the end of his scientific career. Koch became a pensioner.

In the consecutive years, colonial authorities and another generation of younger doctors – some of them Koch's former assistants – went about to create a set of sleeping sickness camps in Germany's colonies. It is in these places that armed guards and barbed wire became customary and which contributed to the image of sleeping sickness control as colonial medicine's heart of darkness. The ones in Togo are best studied.[9] It is the practices in these camps rather than in his own on Sese that are somehow brought forward against Koch.

Conclusion

The *person* and the *persona*, the historical character and its public image, are not the same. The latter, the personae, are in fact our own creations, we are shaping them as an expression of our world views. And as a result, personae change over time: Koch's experimental genius, endeared to mid-20th century doctors, is suited to raise the eyebrows of modern observers who distrust notions of geniality. Albert Schweizer's (1875–1965) humanitarianism strikes us as naïve, because we have taught ourselves to see blatant humanitarianism as a smoke screen for elitism practiced, for instance by NGOs in global health. As a result, we are re-writing colonial histories in the light of recent critiques of global health.

Yet, the irreducible distance in political, cultural moral horizon between the present and the past, should make us careful to judge. Claiming, for instance, that Koch was socially and culturally progressive since he supported the careers of Jewish colleagues and, unusual for his days, a female microbiologist, is ahistorical and naïve, it ignores his rather peculiar motives for doing so. Claiming he was racist is equally questionable. Nowhere in history will we ever find figures that embody our own 21st century ideals. All we can ever achieve is a dialogue, using the material that has come upon

8 Iliffe J. *A Modern History of Tanganyika*. Cambridge: Cambridge University Press, (1979) 2011, 168-202

9 Eckart WU. 'The Colony as a Laboratory: German Sleeping Sickness Campaigns in German East-Africa and in Togo, 1900-1914', *History and Philosophy of the Life Sciences,* 24, (2002), 69-89.

Figure 3. Kibong'oto Infectious Disease Hospital, Director's office. (Photo: Christoph Gradmann 2015)

us from the past. This dialogue with the past can help us to elaborate the traditions we want to uphold or change. Our evaluations need to contextual, engage with people and their circumstances, rather than pinpointing isolated failures and achievements.

To conclude, let me reflect on a picture I took a few years ago. We are in Tanzania's national tuberculosis hospital. Kibong'oto Infectious Disease Hospital being its official title. If we stroll to the director's office, what we see are two portrait photographs.

On top a bigger picture, showing the father of the nation, Julius Nyerere (1922–1999), Tanzania's first president. Below a smaller picture, showing the father of microbes, Robert Koch. This is taken from a tuberculosis non-governmental organization's (IUATLD) poster, done in the 1980s.

Let me be clear: There are no happy memories in Tanzania with regards to German colonial times. It was a war of conquest. I am quite sure that nobody in the hospital thinks that somehow Koch's achievements with regards to tuberculosis exonerate for anything with regards to colonial occupation and rule. Yet, the opposite also seems to be the case, bacteriology is not blamed for colonialism here. The picture is there after all. The director of the hospital would not want to remove the picture of Nyerere, but he could certainly get rid of the sight of Robert Koch in his office if he wished so. As I see it, the arrangement states that there is a substantial link of a different kind. It is a claim to a tradition of medical science. Yet, by placing Nyerere above him and using the IUATLD poster, it also limits Koch's role to that of the study and control of tuberculosis.

The question that I have tried to answer for Koch is if his life and work can be used to illustrate professional and other values we wish to express. In Koch's case, I think, the answer is still a yes. He was the discoverer of the causes of anthrax, tuberculosis and cholera, and we still think that knowing such causes is decisive.He was also involved in the science and practice of colonial medicine. That is something we have to face with responsibility, rather simply to denounce it. He was a top scientist who still spent almost his whole career working as a high-ranking health official. I think that this embodies a notion of scientifically based public health we should applaud.

Not being a saint, Koch is still a role model. As long as we think that researching the microbial causes of infectious diseases, tuberculosis in this case, should be a ground rock of public health and medicine, we can popularize our ambitions through the *persona* of Robert Koch.

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