

External Examiner's Report on the Dissertation of Jakub Mazanec, "Cold War Technopolitics: Czechoslovakia Hydroexpertise in Africa," submitted to the Institute of World History, Faculty of Arts, Charles University, Prague, in 2023

In this original dissertation, Jakub Mazanec explores the role of Czechoslovakia in water resources development across the Global South, particularly in Africa, from the 1960s to the 1980s. After providing an overview about the development hydro-expertise in Czechoslovakia since the 1930s (after 1948 state companies built a series of hydro-electric dams across the country), the dissertation shows how Czechoslovakia became a leader in dam building and water management in the Eastern Bloc and then began exporting this expertise as part of its foreign policy objectives, executed by state-owned companies like Hydroprojekt and Polytechna across the Global South. By the 1980s, Czechoslovakia had established itself as one of the world leaders in the construction of hydroelectric dams. The dissertation looks at three case studies in Ghana, Egypt, and Ethiopia to examine the deployment of Czechoslovak hydro-experts in Africa. Whereas the former two case studies focus on the 1960s, the latter covers the 1980s. The final chapter provides a compelling discussion about the lived experiences among a group of experts, most of them hydro-experts, who worked on behalf of the Czechoslovak socialist state in different locations across the Global South from the 1960s to the 1980s. By the 1960s, Czechoslovakia had an established export-oriented economy. While the country is mainly known for its exports of arms to the Global South, including Egypt, Guinea, Ghana, and Algeria, the dissertation convincingly demonstrates the increasing importance of exporting Czechoslovak engineering products and expertise, particularly in terms of water management. After most water basins in Czechoslovakia had been developed, the country was looking for new markets. The dissertation situates the export of this hydro-expertise and technology within a Cold War context and as part of development initiatives launched by the Global North across the Global South. Mazanec rightfully argues that the Cold War served as an accelerator of water development, which gave smaller actors like Czechoslovakia an opportunity to get involved. Following Langendijk, the dissertation challenges the notion that the US government's export of the Tennessee Valley Authority model was a unique policy intervention across the Global South. Rather, the dissertation successfully shows how river basin development was part of an interconnected global discourse in which Czechoslovak experts have played a significant role since 1930s. The study identifies the permeability of the ideological boundaries, as exchanges and cooperation took places across the Cold War divide. Finally, Mazanec suggests that experts from the East and West perceived the spaces of the Global South, the recently decolonized world, in a very similar way.

Overall Evaluation

The dissertation presents dam building and the development of water resources as a global phenomenon, here explored through the example of Czechoslovakia. It successfully tracks the development of hydro-expertise in Czechoslovakia from the Republican period in the 1930 through the Communist era, from 1948 to 1989. Thereby, the discussion identifies striking continuities concerning the export of hydro-expertise and technologies (during the Republican period through private companies like Lanna, a.s.; later after nationalization through state-owned entities like Hydroprojekt), as Czechoslovakia engaged in global exchanges and knowledge production. By the 1950s Soviet experts gained prominence in Czechoslovak dam building, as such infrastructures became crucial for implementing the industrial objectives of a Socialist

economy. Yet, once Czechoslovak began sending its hydro-experts abroad, Mazanec suggests, they were more interested in solving technical problems than taking a stand with political ideologies. Looking at the three case studies in Ghana, Egypt, and Ethiopia show, the dissertation unpacks Czechoslovakia's motivation to export its hydro-expertise and technology to promote socialist ideals and to generate revenue in foreign exchange. The study examines Czechoslovakia's relationship to its senior partner and hegemon, the Soviet Union, as well as to the three host countries. The study also shows how Czechoslovakia's technopolitics towards the three African countries changed from the 1960s to the 1980s. Whereas the promotion of a socialist ideology was explicitly articulated in the 1960s, economic interests had moved to the foreground by the 1980s. At the same time, relationship with the dominant partner in these exports, the Soviet Union, also changed. Finally, the dissertation explores the lived experiences of a group of successful hydro-experts (six of them, born between 1919 and 1950) and shows how they participated in a "scientific and technological internationalism" (178). Communities of experts, as the dissertation argues, became "important elements of the Cold War internationalization" (179). These experts were all men, as Mazanec notes (148), though this observation is not further explored in terms a specific construction of masculinity.

Detailed Evaluation

Structure of the Argument

The dissertation develops and maintains a set of arguments, developed in the introduction, across the five empirically based chapters. It documents and analyzes the production of Czechoslovak knowledge in water management and shows how this expertise developed within a larger global discourse. Inspired by the concept of technopolitics, as introduced by Gabrielle Hecht and Timothy Mitchell, Mazanec uses the term hydropolitics to show how the Czechoslovak state deployed technologies of water resource development and management, first domestically and but then increasingly abroad, to achieve its political objectives to provide "brotherly assistance" to other socialist countries and to generate revenue in hard currency. The dissertation convincingly shows the importance of smaller actors, like Czechoslovakia, in the export of hydro-technology to Africa and elsewhere in the Global South. The dissertation offers a welcome corrective to recent scholarship on the constructions of large hydroelectric dams Africa, which have overlooked the Czechoslovak contributions (including my own book *A Dam for Africa*).

The dissertation frequently suggests that Czechoslovak exports of hydro-engineering and other expertise was to promote Czechoslovak socialism. However, how such strategies on the ground were deployed is not fully developed. It would be good to provide a few concrete examples on how the Czechoslovak presence in Ghana, Egypt, and Ethiopia actually contributed to the stated goal of creating a socialist society. For example, was the objective to build hydroelectric plants connected with clear outcomes of electrifying the countryside, of providing electricity and other modern amenities such as drinking water, sanitation, and healthcare to once underserved communities?

The dissertation claims that the deployed experts contributed to create a concrete image of socialist Czechoslovakia in three countries of Ghana, Egypt, and Ethiopia. It would be good, and would not require much additional research, to show how the Czechoslovak presence was perceived these countries. For Ghana, I suggest that Mazanec consult the newspapers *Daily*

Graphic and Ghanaian Times to provide an understanding about the local reception of the foreign experts.

The dissertation argues that the recently decolonized world, was perceived by experts from East and West in a very similar way. Can the author be more explicit how Czechoslovak experts deployed colonial discourse, perceived the different local settings in Africa through a colonial lens, in spite of their socialist aspirations and claims. For example, Antonin Petlach echoes a colonial language when he describes the difficulties his team encountered due to local belief systems. The “natives” (a colonial and racist term) believed in the existence of spirits, whom they called “juju” (p. 93). These spirits dwelt in rivers, streams, and rock, which impacted the survey. Moreover, there were specific days when it was forbidden to approach the water. This could have been an opportunity to say more about the Akan belief system and how it impacted the foreign experts’ work.

In chapter 5, the reader learns about the community of hydro-experts through brief vignettes of individual people. All members of this expert community were men, since women “rarely worked in the field of hydroexpertise, and even more rarely went abroad” (148). In order to gain a fuller understanding of these male experts, it would be interesting to say more about these men’s notions of masculinity. It appears that based on their professional expertise and based on their experience abroad, they became a specific type of men who differed from other men back in Czechoslovakia. For example, as “field experts” they differed from “office experts” (academics, administrators), since the latter lacked the intimate familiarity, the “connection” (149) with the Global South. In other words, how did the experience of living the Global South, in places like Ghana, Egypt, and Ethiopia, turn these hydro experts into a different type of men? It is striking that three of them (Kraus, Sames, Balek) wrote autobiographies, which indicates that they considered their own lives as unusual and sought to their insights and experiences with a wider community of readers.

Formal Aspects of the Dissertation

The dissertation is mainly well written. However, there are few items the author should address before filing the final version of the dissertation:

Strange font in footnotes: In the PDF copy I received, there is a problem with the font in the footnotes throughout the dissertation. For example, in note 9, “Transac+tions” should read “Transactions.” Please check all footnotes for correct citations and make sure the font is correct.

Citation style: It is odd that articles and book chapters are italicized (usually only titles of journals and books should be italicized). I suggest that book chapters and articles are placed into quotation marks. Furthermore, the author is not consistent in capitalizing titles of books, articles, and book chapters.

There are some odd (at times incorrect) formulations in the dissertation that the author should change. Here is a list:

Introduction

p. 14 tenth line: change “administrations” to “governments”

- p. 14 fifth line from bottom: change “paper” to “dissertation” (make this change throughout the dissertation when the term paper is used)
- p. 16 second line from bottom: change “They” to “Scholars in this field”
- p. 17 note 10: missing year in Pritchard citation (also fix in bibliography)
- p. 18 top line: change “domestic state” to “newly independent states”
- p. 24 fifth line: insert comma after “Union of Students”
- p. 26 note 46: the year is missing in the citation of Buzassyova’s dissertation
- p. 29 note 60: Bishop’s “Talking Shop” is a dissertation (University of Chicago, 1997)
- p. 32 end of first full paragraph: break up the long sentence that lists the dissertation’s key questions (perhaps change the long sentence into three separate questions, each organized as a sentence).
- p. 33 seventh line from bottom: the term “funds” is confusing here. I think the author refers to the records or archival collections from the Lanna Company; hence change the term “funds” to “records” or “archival collections”
- p. 39 sixth line: replace “funds” with “papers”
- p. 40 second line of second full paragraph: replace “funds” with “collection” (replace “funds” with a more appropriate term throughout the dissertation)

Chapter 1

- p. 42 fourth line from bottom: insert “earth” before “dam”
- p. 43 first line: replace “or” after (Egypt) with “and”
- p. 52 last paragraph: the first sentence should read: “Since the 1960s, Czechoslovak hydraulic companies had been represented in the acquisition....”
- p. 58 last line: “foundry” in Linden; do you mean an alumina plant that refines raw bauxite, or do you mean an aluminum smelter that smelts alumina into aluminum ore (the latter uses a large amount of electricity and thus depends on a source of cheap electricity)?
- p. 64 beginning of block quote: missing quotation mark

Chapter 2

- p. 71 second line from bottom: “a former Gold Coast” should read “the former Gold Coast”
- p. 72 first full paragraph, fifth line: “nkrumahism” should read “Nkrumahism”
- p. 72 first full paragraph, seventh line: replace “tribal tolerance” with “ethnic tolerance” (in an African context, “tribal” is a colonial, racist term; avoid using it)
- p. 79 thirteenth line: “still-independent Gold Coast” should read “then still dependent Gold Coast”
- p. 79 seventh line from bottom: replace “Ayena” with “Ajena”
- p. 78 sixth line from bottom: “was carried out by the American Kaiser Industries Company, which” should read “was carried out by Kaiser Engineers, a subsidiary of the U.S. multinational company Kaiser Industries, which...”
- p. 80 first full paragraph, second line: replace “at midnight on 7 March” with “at midnight on 6 March”
- p. 80 last paragraph, fourth line: insert quotation mark before “Completion”
- p. 81 first full paragraph, first line: “cold war” should read “Cold War”
- p. 81 first full paragraph, fourth line: delete “concrete” (Akosombo is a rock filled dam....)
- p. 81 second line from bottom: Macmillan quote should be placed in quotation marks

p. 82 first full paragraph, fourth line: replace “the aluminum industry was to move from the north closer to the coast to Tema” with “the aluminum smelter was to move from Kpong below the dam to the new harbor city of Tema”

p. 82 bottom line: replace “was building” with “had built”

p. 83 second full paragraph, fifth line: replace “Ayena” with “Akosombo”

p. 87 caption of Fig. 6: the picture was most likely taken in December 1961, when Rene Sames and Antonin Petlach were invited to a banquet at Nkrumah’s residence (as mentioned on p. 94). The African man wearing Kente is Krobo Edusei, Minister of Light and Heavy Industries – identify him

p. 87 first paragraph, second line: replace “were thinking” with “was thinking”

p. 91 first full paragraph, first line: replace “provinces” with “regions”

p. 91 first full paragraph, second line: replace “provinces” with “regions”

p. 93 second full paragraph, second line: avoid the term “natives,” which is a colonial term and considered racist and offensive in African contexts. Replace it with “local people”

p. 93 third paragraph, first line: change the term “esoteric.” Note: the experts’ difficulties with the local believe system is one of the few places Ghanaian cultures appears in the text; here the reader gets a sense about the encounters that took place. The Takoradi strike was a major event in Nkrumah’s rule and thus certainly not esoteric either.

p. 97 first full paragraph: once the design for Hemang and Tanoso Hydro Projects were complete, what was the suggested installed capacity (in MW) of these two dams?

Chapter 3

p. 100 tenth line: Replace “1990s” with “1890s”

p. 102 bottom line: “34.8 million Egyptian pounds” – it would be helpful to provide the approximate amount in US dollars, or British pounds (1958 exchange rate). Throughout the dissertation, whenever citing figures in a local currency, also convert the amount into an international currency (US dollars or British pounds).

p. 104 third line: “overthrew the monarchy in November 1954” – check this date

Chapter 4

p. 124 third line: the formulation “backward to primitive agrotechnology” and a “wasteful approach” sounds colonial and dismissive. Is this your assessment, or the assessment of Czechoslovak Foreign Ministry? If it is the latter, make this explicit.

p. 124 first full paragraph, fourth line: is “three” hydropower plants the correct number? Later in the sentence you list four plants...

p. 124 last paragraph, first line: provide the year of the treaty between Emperor Menelik II and the British government; hence it should read “the 1902 agreement between...”

p. 129 sixth line from bottom: “ECU 37 million” – also provide the amount in US dollars

Chapter 5

p. 146 fifth line from bottom: change “paper” to “dissertation”

p. 148 fifth line from bottom: change “third world” to “Third World”

p. 149 fourth line from bottom: change “The how strongly...” to “How strongly...”

p. 150 first line: “examples of 6 Czechoslovak hydro professionals” – yet above you noted that only “5” of them were “prominent . . . water experts” (p. 148) – which figure is correct?

- p. 150 section on Alois Kraus, second line: replace “reconstruction” with “heightening” (also on p. 157, second full paragraph, eight line)
- p. 153 third line from bottom: delete “Southern Rhodesia” – this former British colony is already mentioned as “Zimbabwe” in the same sentence
- p. 154 final paragraph in the section on Petlach, first and second line: since Petlach is still alive, change “spoke” to “speaks” and “was married” to “is married” (unless he separated from his wife)
- p. 158 eleventh line from bottom: change “Boulder Dam” to “Hoover Dam”
- p. 159 second paragraph, fifth line: insert “in” before “Czechoslovakia”
- p. 159 seventh line from bottom: change “third world” to “Third World”
- p. 161 seventh line: “interviews with survivors confirm that the 1968...” – list some of these interviews in a footnote
- p. 167 first line: change “exotic cuisine” to “unfamiliar cuisine” – avoid the trap of exoticizing unfamiliar contexts in Africa
- p. 167 first full paragraph, first line: change “better money” to “more money”
- p. 170 first line: change “metropolises” to “capital cities” of, if appropriate, “major cities”
- p. 170 second full paragraph, sixth line: replace “sending country” with “host country”
- p. 171 Fig 15 caption: insert “a” before “Ghanaian Village”
- p. 172 fifteenth line from bottom: place the Balek quote into quotation marks
- p. 174 fifth line from bottom: replace “ghosts” with spirits or “gods”; also replace “natives” with “local population”
- p. 175 Fig. 16 caption: can you identify the Ghanaian man standing next to Ververka? If not, say at least that he was most likely Ververak’s driver and interpreter, who played a crucial role in how this Czechoslovak expert engaged with the communities
- p. 185 fifteenth line from bottom: after “Volta River Project,” insert “, the latter studied by British and U.S. experts.”
- p. 185 twelfth line from bottom: change “Kaiser Company” to “Kaiser Engineers”
- p. 188 third line: Change “The how they perceived...” to “How they perceived...”

Bibliography

- p. 196 entry for Bishop, Elizabeth: move this entry from the section “Books” to the section “Dissertations and Theses”
- p. 199 entry for Haas, Peter: Is the journal called *International Organization*? If so, deleted “in: Cambridge Journals”
- p. 200 entry for Langendij, Vincent: replace the page range “318-319” with “316-337”; insert the year “2019”
- p. 202 entry for Pritchard, Sarah: the year is missing

Use of Source and/or Material

The dissertation makes excellent use of Czechoslovak government sources housed in different archives: Ministry of Foreign Affairs, Ministry of Trade, presidential papers, security forces, state-owned companies, as well as records of the Communist Party. The study also draws on some print sources, such as technical journals and newspapers. In addition, Mazanec consulted autobiographical writings and personal papers of some of the hydro-experts; he also interviewed a few of them. For the Ghana case study, Mazanec also consulted records in Ghana (Public

Records and Archives Administration Department in Accra, Volta River Authority), in the United Kingdom (National Archives), and in the United States (World Bank Archive).

There are few additional works the author might want to consider when doing final revisions on the dissertation:

There is large scholarship on modernization and modernity, which should be briefly referred to when introducing the “idea of modernization” (17). The author mainly draws on a short section of Gabrielle Hecht’s introduction in her collection *Entangled Geographies* (17-18). See Frederick Cooper, *Colonialism in Question* (Berkeley: University of California Press, 2005), particularly the chapter on modernity; Lynn M. Thomas, “Modernity Failings, Political Claims, and Intermedia Concepts,” *American Historical Review* 116, no. 3 (2011): 727-740; and Peter J. Bloom, Stephan Miescher, and Takyiwaa Manuh, eds., *Modernization as Spectacle in Africa* (Bloomington: Indiana University Press, 2014).

When presenting Africa as a laboratory of science and expertise (32), the author might want to refer to Helen Tilley, *Africa as a Living Laboratory: Empire, Development, and the Problem of Scientific Knowledge, 1870-1950* (Chicago: University of Chicago Press, 2011).

For more background on Nkrumahism (72), see Jeffrey Ahlman, *Living with Nkrumahism: Nation, State, and Pan-Africanism in Ghana* (Athens: Ohio University Press, 2017) and Ama Biney, *The Political and Social Thought of Kwame Nkrumah* (Houndsmills, UK: Palgrave Macmillan, 2011).

The work of Rene Sames and his team was impacted by the Takoradi railway strike of 1961 (93). Since this was a major labor conflict that challenged Nkrumah’s rule over Ghana, it would be helpful to provide a bit more context; see Richard Jeffries, *Class, Power, and Ideology in Ghana: The Railway Men of Sekondi* (Cambridge: Cambridge University Press, 1978); the more recent book by Jeffrey Ahlman (cited above) provides a succinct discussion of this important strike.

Personal Contribution to Subject

The author uses the primary source material, informed by secondary scholarship, to make several original contributions to scholarship.

The first chapter provides a useful historical account on how Czechoslovakia has gained expertise in in water resources development and management since 1930s. By the 1960s, the country was not only a leader of the Eastern Bloc in terms of water management knowhow and technology, but also established itself as “one of the world leaders” (68). The chapter makes a convincing argument about the continuity of Czechoslovak hydro-expertise, from a period of private hydro companies becoming important players in foreign markets in the 1930s and 1940s, to Czechoslovakia investing in socialist brother countries in the 1950s, and then, beginning in the 1960s, exporting its hydro-expertise across the Global South, which continued even after the collapse of the socialist regime in 1989.

In the Ghanaian case study (chapter 2), the author shows how Czechoslovak experts studied the potential of hydro resource development in the southwestern part of the country and then

conducted detailed design studies for the Hemang and Tanoso hydroelectric projects. The (historical) scholarship on Ghana's hydro resources, so far, has mainly focused on the Volta River Project and has not taken into consideration the presence of Czechoslovak experts. Although neither Hemang and Tanoso were built after the completion the Czechoslovak studies, these projects have not been forgotten. It is quite likely that these dams will be realized in the near future, as Ghana, in light of climate change and pressure to move away from fossil fuels, looks for additional and renewable sources of energy.

In the Egyptian case study (chapter 3), the author shows how Czechoslovakia was very interested in participating in the construction of the Aswan High Dam, but in the end, the Soviet Union did not permit the former's participation. The Aswan High Dam, as the author suggests, became an "exclusively Soviet project without much participation from other socialist countries." The Soviets considered Aswan a prestige project which they claimed for themselves (118). The potential Czechoslovak participation in the Aswan High Dam, as the author argues, "has not been told until now" (181). The study provides new information about the dynamics of the Soviet-Czechoslovak cooperation in offering expertise of the countries in the Global South. Another surprising aspect of the Egyptian case study is that Czechoslovak experts worked for Western companies, for example, when assessing the possibility of exploiting the Qattara Depression (116).

As the third case study shows (chapter 4), the relationship between the Czechoslovakia and the Soviet Union had changed by the 1980s, when both countries played important roles in the construction of Ethiopia's largest hydroelectric dam, the Malka Wakana project. Unlike in the case of the Aswan High Dam, the Soviet Union welcomed the Czechoslovak participation in Malka Wakana, with the former building the dam in cooperation with Ethiopian firms and the latter providing and assembling the turbines. The author shows the "continuity of the technocratic cooperation" (122) between Ethiopia and Czech experts (providing hydrogeological expertise in mapping the hydro resources), even after a regime change had happened in both countries. The author also covers the experiences of the Czechoslovak experts Ethiopia but has little to say about their engagement with the local population.

The fifth chapter, which presents the working of the state-owned foreign trade company Polytechna and the personal experiences of a group of hydro-experts, is especially rich and innovative. The author provides an excellent account on how these Czechoslovak experts became members of an internal expert community and thus embodied a form of technocratic internationalism within a Cold War context (147). The author unpacks the paradox that these Czechoslovak experts, who were supposed to represent the accomplishments of a socialist state (155), had quite an ambivalent relationship with the political regime at home. They were, as the author suggests, "apolitical technocrats" and thus not very interested in the "political dimension of their mission" (166). Several of the experts whose lives are featured considered emigration but ultimately decided to return to Czechoslovakia. In addition, the fifth chapter is informative in its discussion of Polytechna, in terms of its recruitment practices, pre-departure preparation, salaries, and limited control of their experts working abroad (169).

In the 1960s Czechoslovakia aspired using its hydro-expertise not only to provide countries in the global south with the access to hydroelectricity but also to "promote socialism in African countries" (182). By the 1970s, these priorities had shifted. "Hydropolitics," the export of hydro-

technology carried out by hydro-experts, became mainly a money-making enterprise with the hope to “strengthen Czechoslovakia’s position in the particular destination country” (182). Czechoslovakia became known for its expertise and export of “small and medium-sized hydroelectric power plants and their complex equipment” (183).

Questions for the Author

I have a few questions which I would like to discuss with the author during the defense.

1. Can you provide a more succinct understanding of the Czechoslovak model of modernization, how it was developed, and particularly how it was received abroad? You briefly mention it in terms of Brazil (60), but you are less explicit when discussing this Czechoslovak model in the three case studies. Thinking of the interventions by Frederik Cooper and Lynn Thomas (their works are mentioned above), you may want consider modernization (and modernity) not as analytical categories but as concrete historical concepts that need to be contextualized within specific historical contexts.
2. Can you say more how the Czechoslovak experts were received and perceived in these cases studies (Ghana, Egypt, Ethiopia). You provide interesting starting points at two places (93, 174) but more could be said. To what extent were these unequal, colonial relationships, though unfolding in postcolonial contexts? The local reception, I suggest, was important for the experts’ personnel and professional experience. Moreover, I am wondering whether the engagement with local interlocutors and local experts (for example, technical officer of Ghana’s Volta River Authority and of government agencies), shaped this expert encounter.
3. Can you elaborate on the relationships the Czechoslovak experts had in Africa with their servants (167), with their peers (for example, Ghanaian experts), and with other members of the international expert community?
4. Can you introduce gender as an analytical category? How, and to what extent did the process of engaging with a different cultural environment in African contexts had an impact on these men’s notion of self, of their comportment as men, on how they were perceived by other men, such as “office experts,” who did not share in their African experience? In addition, these hydro-experts lived with other expatriates in African settings, engaged with them in professional settings like conference and international meetings (Knaus, Balek), and thus became part of an “international expert community” (149). How did membership in this international community of experts impact their sense of self, their comportment as men, and the perception of them by others? You may want to look at the hydro-experts’ autobiographies, at media representations of them, and at the records kept by the State Security Service. Hence, can you gender these men, can you apply a gendered perspective to your analysis?
5. What were the costs of using Africa as “hydraulic laboratory” (178)? If Africa was for the Czechoslovak experts a kind of “hydraulic laboratory” where “risky procedures” were performed “that could not be tried at home” (178), what was the impact on the local population? Were African workers, who had to implement these risky procedures, subjected to additional harm? What does this practice say about the perception of and attitude to Africa and Africans maintained these Czechoslovak experts?

Conclusion

This is an excellent, well-researched, and well-argued dissertation, which I enjoyed reading. I commend the author of having produced such an original and compelling piece of scholarship.

In terms of revisions, I would like the author to address the issues listed und “Formal Aspects of the Dissertation.” Furthermore, I encourage him to consider some of the other suggestions presented above. However, I am aware that time constraints might not permit to follow up on all of them before the dissertation has to be filed.

Finally, I am very pleased to state that I provisionally classify the submitted dissertation as passed.

Stephan F. Miescher
10 January 2024