Truth, like water, will find its way out:
My Response to Günter M. Ziegler and the Deutsche Mathematiker-Vereinigung
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> *The past is never dead. It's not even past.*
> – William Faulkner[1]

A thought of responding to reviews of my works has never crossed my mind before. However, Günter M. Ziegler's 9-page long text [1] that appeared in late 2014, six years (!) after the publication of *The Mathematical Coloring Book* [2], contains so many errors and misrepresentations that it merits a response to its criticism of my mathematics and my history. It also raises questions about the real subject of the review by Ziegler, the 2006–2008 President of the *Deutsche Mathematiker-Vereinigung* (DMV, German Mathematical Society). Finally, we have to question wisdom and integrity of DMV, the Society that accepted the unacceptable Ziegler's review for publication in its official *Jahresbericht der Deutschen Mathematiker-Vereinigung*, while its Editor Hans-Christoph Grunau refused to publish my response or even a Letter to the Editor.

1. MATHEMATICS

1.1. Four-Color Problem

Prof. Ziegler opines that the Four-Color Problem (4CC), discussed in my book, was a bad problem, yet he himself admits how important and influential it has been for a century and a half (p. 263): "Was this a good problem? Certainly it was important, as it has driven the development of graph theory to a large extent."

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[1] *Requiem for a Nun*, 1951.

He then guesses on who was responsible for Heinrich Heesch not getting a grant to work on 4CC, and thus Heesch "couldn't complete his proof, and the fame for solving the problem instead [sic] went to Hermann [sic] Haken and his team." How can Ziegler be certain that with a grant Heesch would have found a proof? Does money guarantee proofs in mathematics? Isn't Ziegler's "instead" hints to a stolen credit? Didn't Wolfgang Haken and Kenneth Appel deserve high honors for conquering the problem that had withstood all assaults for 124 years?

Ziegler mentions as if in passing, "the [Appel–Haken] proof was reworked [sic] later by Robertson et al." While we do not have in mathematics a definition of "distinct proofs," Ziegler's remark is a severe understatement. The 1997 Robertson–Sanders–Seymour–Thomas proof was dramatically better than that of Appel–Haken. Instead of 486 secondary discharging rules (those unfamiliar with the terminology can think of these rules as 'ideas'), the new proof used just 20! Consequently, when in 1989 Appel–Haken proof finally appeared in print, it filled 741 oversized book pages, whereas the new proof comprised a very readable journal article of 43 pages. Moreover, the new proof was verifiable, for the authors achieved a clean separation of what they did by hand (better said, by mind) and what their computer did.

On August 14, 1991, Paul Erdős wrote to me "I would be much happier with a computer-free proof of the four color problem, but I am willing to accept Appel–Haken proof – beggars cannot be choosers." Perhaps, Prof. Ziegler ought to be less choosy and not dismiss as "bad" this major, influential, celebrated, classic problem of mathematics.

1.2. Chromatic Number of the Plane

Ziegler opines that finding the chromatic number of the plane (CNP) is also a bad problem (p. 265): "The chromatic number of the plane: Is this a good problem? Again this is a question of taste. In my view

the fact that there is so little progress on the original problem in so many years, and progress only on variations, and that the answer might depend on set theory all indicate that it is not a productive, helpful problem."

Ziegler's logic is absurd. The indication that the problem is hard and consequently takes a long time to be conquered, he uses as a proof that it is bad! If "the fact that there is so little progress on the original problem in so many years" were to imply a bad problem, then *all* the great classic problems of mathematics would be bad, from Fermat's Last Theorem, which required ca. 360 years, to the Poincare Conjecture, the Goldbach Conjecture, the Riemann Hypothesis, , etc., etc., etc.

Yes, it is a matter of taste, but Ziegler's taste puts him in a tiny minority, perhaps, the minority of one, when he suggests that CNP problem is bad. The greatest problem creator of all time Paul Erdős liked CNP problem so much that he included it in his numerous problem papers and talks, and so did the leader of Ramsey Theory Ronald L. Graham. CNP problem was selected for the inclusion in the well-known problem books "Unsolved Problems in Geometry" by Croft–Falconer–Guy, Springer, 1991, and "Old and New Unsolved Problems in Plane Geometry and Number Theory" by Klee–Wagon, Mathematical Association of America, 1991. I was invited to write Chapter 8 on CNP and related problems for the just published book "Topics in Chromatic Graph Theory", Cambridge University Press, 2015, by Lowell W. Beineke and Robin J. Wilson (editors). The Nobel Prize (1994) and Abel Prize (2015) winner John F. Nash, Jr. liked CNP problem so much that he invited me to write a chapter on it for the forthcoming ca. 2016 Springer book intended to be edited by Nash and Michael Rassias on famous "Open Problems of Mathematics," where other chapters are dedicated to such celebrated classic unsolved problems as the Riemann Hypothesis, the Goldbach Conjecture, the P versus NP Problem, the Hadwiger Conjecture, etc.

1.3. Where Are Mathematical Errors Found by Ziegler?

After "struggling with the book for 2 ½ years (!) on the way to this review" (p. 262) Günter Ziegler found *no* mathematical errors in the book. Apparently, he had to criticize something else, and so he criticized the choice of problems.

2. HISTORY

2.1. Ziegler Corrects Incorrectly

G.M. Ziegler quotes me and then unsuccessfully attempts to refute my statements, (pp. 266–267):

> Soifer reports that Bartel Leendert van der Waerden […] proved this pioneering result while at Hamburg University and presented it the following year at the meeting of *D.M.V.*, *Deutsche Mathematiker-Vereinigung* (German Mathematical Society) in Berlin. The result became popular in Göttingen, as the 1928 Russian visitor of Göttingen A. Y. Khinchin noticed and later reported [Khi1], but its publication [Wae2] in an obscure Dutch journal hardly helped its popularity. […]

> This report gets a number of facts wrong. For example, the DMV meeting 1928 was held in Hamburg, and Aleksandr Khinchin writes that the result was obtained in Göttingen. The "obscure Dutch journal" was *Nieuw Archif voor Wiskunde*.

Not Soifer – Van der Waerden himself wrote the Story of Creation of this proof in 1926 in Hamburg with the aid of Emil Artin and Otto Schreier, and Ziegler read that Story in my book ([2], Chapter 33).

Not Soifer, and not 1928 – Alfred Brauer wrote that Van der Waerden found his proof in 1926 and presented it "the following year at the meeting of *D.M.V.*" The following year here obviously meant 1927, thus Ziegler's alleged 'correction' that the 1928 meeting was held in Hamburg is irrelevant.

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Not Soifer – Khinchin incorrectly stated that the result was obtained in Göttingen – thus, all the complaints should be sent to his heirs.

Not Soifer – Nicolaas G. de Bruijn called *Nieuw Archif voorWiskunde* an "obscure Dutch journal," and he certainly knew that journal much better than Ziegler.

2.2. Authorship of the Conjecture

Ziegler rhetorically asks (pp. 266–267), "Why this urge to prove Van der Waerden wrong about the origin of the conjecture, if he apparently heard it from Baudet?"

After reading my book "for 2 ½ years," Ziegler must have learned that P.J.H. Baudet passed away in 1921, while Van der Waerden stated that he heard the conjecture in 1926. Therefore, Van der Waerden did *not* hear the conjecture from Baudet.

Ziegler then (ibid) raises another rhetorical question, "Does it really make sense to talk about the 'authorship of the conjecture'?"

Yes, it most certainly does. What would the provers be proving if someone did not author – create – good conjectures for them? I generally view creating a good conjecture as important as proving it, and hence systematically give joint credit for theorems to the author of the conjecture and its prover. Shouldn't we give credit where credit is due?

Good conjectures inspire and direct research, and at times it is very hard to envision the future, i.e., to create a good conjecture. If it is always easy, as Prof. Ziegler suggests, why wouldn't he, for example, conjecture for us criteria for a graph to be Hamiltonian?

2.3. Ziegler Offends Van der Waerden without any Substantiation

Ziegler pleads impartiality toward Van der Waerden (p. 267): "I have no stakes in Van der Waerden, I have never met him, and I cannot (and dare not) judge him, neither his contributions to Mathematics, nor what he did or didn't do for example as a professor in Leipzig 1931–1945." Ziegler then offends Van der Waerden without any substantiation when he claims (p. 267) that "Some of his [Van der Waerden's] actions seem to have harmed Jewish colleagues (but I don't know and can't judge whether any of this was intentional or even done knowingly)."

Where are the facts to back such a horrible false defamatory accusation? I spent 20 years researching Van der Waerden's life and showed clearly in my two books [2, 3] that Van der Waerden had never been an anti-Semite. Moreover, he was prevented from succeeding Constantine Caratheodori at Munich precisely because he was perceived as a philo-Semite. In 1935, Van der Waerden bravely published a eulogy for his beloved Jewish teacher and mentor Emmy Noether in *Mathematische Annalen.* In my two books I describe at a great length the May 1935 Faculty Meeting at Leipzig, where Van der Waerden, Werner Heisenberg, and three other scholars publicly (!) protested the firing of five Jewish professors from Leipzig University. When their protest did not succeed, they even contemplated a group resignation!

2.4. Ziegler then Groundlessly Accuses Soifer

Ziegler baselessly and with a great redundancy accuses me of "badly disliking" Van der Waerden:

"The only plausible reason I can see for Soifer's passion and persistence in his investigations and his attempts to find fault with Van der Waerden is that he badly dislikes him." (p. 267)

"He [Soifer] badly tries to find fault in his stay at Leipzig University during Nazi times, and so on." (p. 267)

"It cannot be good if a historian has an ax to grind, if from the outset he *wants to prove* things about his subject of study, since this will color his judgement." (p. 267)

"The impression remains of a personal war." (pp. 267–268)

"This passion and scornfulness against Van der Waerden." (p. 268)

"Soifer's persistent personal campaign against Van der Waerden." (p. 268)

A historian is not in the business of liking or disliking the subject of his research. As a historian, I paid the ultimate respect to B.L. van der Waerden by telling the truth, grounded in facts, revealed by decades of archival research and eyewitness testimonies.

Concerns about Van der Waerden's presence in Nazi Germany for the entire duration of the Third Reich were raised contemporaneously by Otto Neugebauer, Richard Courant, Solomon Lefschetz, Johannes G. van der Corput, editors of *Het Parool*, and others. I communicated their concerns in my two books [2, 3], as well as I included instances of brave and honorable conduct exhibited by Van der Waerden during those horrific times.

2.5. Ziegler Admits: He Is Not a Historian and Has Not Been to Archives

Ziegler admits (p. 267): "At this point, I must say that I am not a historian, I have not read all materials and I have not been to the archives, so I can't really judge this."

Perhaps, this explains Prof. Ziegler's unsubstantiated accusations of Van der Waerden and of me. Surely, Ziegler would not want a non-mathematician to criticize mathematical research. Doesn't history deserve respect and rigor every bit as much as mathematics?

3. SINCE IT IS NOT MATH, AND NOT HISTORY, WHAT IS THE SUBJECT OF ZIEGLER'S REVIEW?

As we have seen, Günter Ziegler found no grounds to correct mathematics or history presented in my book. What is then the subject of Ziegler's criticism of *The Mathematical Coloring Book* [2] and my new 2015 book *The Scholar and the State: In Search of Van der Waerden* [3], which Ziegler mentions in his review, and therefore is likely reviewing it right now?

Is it that I expressed my opinion that too many potentially-good Germans – including the majority of professors – remained silent and thus made Nazism in Germany possible?

Is it that I questioned the International Mathematics Union (IMU), which ever since 1981 has been etching on its prestigious gold medals the profile of the Finnish *Waffen SS* Volunteer (Recruitment) Committee Chairman Rolf Nevanlinna, that same Nevanlinna who in his speeches and papers praised Adolf Hitler as the Savior of Europe?

Is it that I was concerned when the 2002–2013 Director of the *Mathematisches Forschungsinstitut Oberwolfach* Gert-Martin Greuel started the history of his Institute in 1946, thus concealing its 1944 start by the Nazi Wilhelm Süss, with the approval by one of the most notorious Nazi criminals Hermann Göring?[2]

Is it that in my 2014 book review I objected to Roquette–Frei–Lemmermeyer fabricating a hero out of Nazi-collaborating Helmut Hasse? Do the readers know that this review was published on June 21, 2014, https://zbmath.org/?q=an:06214484, censored and removed from the *Zentralblatt für Mathematik* web site on July 9, 2014, by the Zentralblatt's Secretary Barbara Strazzabosco, and published again by the decision of the Editor-in-Chief Gert-Martin Greuel on September 4, 2014, Zbl 1294.01004 ?

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[2] http://link.springer.com/chapter/10.1007%2F978-3-642-25710-0_26

What was the goal of Ziegler waging such an all-out attack, consisting of fallacies and irrelevancies? Was it a hope that if to throw enough accusations – even the dedication to my late father and "the" in the book's title did not escape Ziegler's ire – something would stick? As Joseph-Marie, comte de Maistre (1753–1821) wrote (*Les soirées de Saint-Pétersbourg*, Ch. I),

> False opinions are like false money, struck first of all by guilty men and thereafter circulated by honest people who perpetuate the crime without knowing what they are doing.

Ziegler's review is symptomatic of serious problems of Germany dealing with its past, even now, 70 years after the end of the Nazi State. On April 23, 2014, I received a communication from the well-known German scholar Moritz Epple, Professor of History, specializing in the History of Mathematics at Goethe University Frankfurt. I did not communicate with him before Springer Birkhäuser made Prof. Epple the official referee of my 2015 book *The Scholar and the State: In Search of Van der Waerden* [3]. Epple raises the veil off the 'Secret Life of the Postwar Germany' and in doing so makes clearer to us the subject of Ziegler's review:

> I was born in 1960 into a country in which virtually everyone of the older generation was declared free of any serious guilt, except the few obvious villains whose involvement in atrocious and – for me as a young person – completely unfathomable crimes was so obvious that no one could get around it. But all the others, the van der Waerdens, own family members, older teachers and later even some professors: What about them?
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> ... well, to put a long story short: To NOT talk about the moral problems that their earlier lives involved seemed to be the silent agreement that kept (and to some extent still keeps) this society going.
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> Ever since I understood this (if I really understood – who can be sure) I felt the need to join those who addressed these

issues with careful, but sharp judgement, and to break, rather than to prolong, the silent agreement of suspending judgement. Conflicts were the unavoidable consequence for all of us.

After the first few chapters of your book I understood that your challenge to the reader was exactly this: To provoke her or his moral judgement, on the basis of a wealth of relevant information.

The more I read, the more I enjoyed reading your text. You do make a strong case.

I think the need to make such cases about life in Nazi Germany, and in the occupied countries, still is and remains great. Of course at some point in history other aspects of our complicated present and recent past may require similar attention – keeping the borders of the richer countries of our world shut for refugees comes to mind
– but the Nazi past still haunts us in so many ways. And especially us who were born into families who in some non-zero degree were involved in, and responsible for, the reality or at least the possibility of the crimes of this period.

On August 27, 1811, de Maistre famously wrote, "Every nation gets the government it deserves." Likewise a society president is the deserved face of that society. This review by the 2006–2008 DMV President Ziegler brings memories of the 1938–1945 DMV Führer Wilhelm Süss, who instigated the expulsion of all Jews from DMV even before his Nazi patrons asked for it. When in 1948, the expelled mathematician Max Dehn was invited back to DMV, he replied:

I cannot rejoin the *Deutsche Mathematiker-Vereinigung*, I have lost confidence that such an association would act differently in the future than in 1935 ... I am not afraid that the new DMV will again expel Jews, but maybe next time it will be so-called communists, anarchists or 'colored people.'

Surely, at times my books deliver inconvenient truths. I know that there is no such thing as a free free speech, and thus I am not surprised when the invoice for my exercise of free speech arrives. Ziegler's review vividly illustrates how important and timely my two books [2, 3] are for Germany in particular and the world in general. The treatment of the German past affects the integrity of the German scholarship today and tomorrow. I deeply appreciate the brave honest path paved by Herbert Mehrtens, Moritz Epple, and some other German scholars.

One of the main reasons I researched archival documents for 20 years was to learn important lessons and apply them to today's world, where the 2014 Russian annexation of Ukrainian Crimea eerily reminds us of the 1938 German annexation of Czechoslovakian Sudetenland. Sadly, in both cases the majority of the intellectual elites – artists and scholars – supported the criminal tyrants. Both times the world hoped to satisfy the insatiable appetites of the tyrants by throwing them Poland then and Ukraine now. Complicity and conformism will not pave a path to a brighter future. We ought to look the past straight in the eyes, learn from it, and strive to never repeat past mistakes. The German unwritten agreement to conceal its tragic past will not work. Truth, like water, will find its way out.

Bibliography

1. Günter M. Ziegler, "Alexander Soifer: 'The Mathematical Coloring Book. Mathematics of Coloring and the Colorful Life of Its Creators' Springer-Verlag, 2009, xxx+607 pp." Published online: 18 September 2014; © Deutsche Mathematiker-Vereinigung and Springer-Verlag Berlin Heidelberg 2014**;** Jahresber Dtsch Math-Ver (2014) 116:261–269. http://link.springer.com/article/10.1365%2Fs13291-014-0101-y
2. Alexander Soifer, *The Mathematical Coloring Book: Mathematics of Coloring and the Colorful Life of Its Creators*, Springer, New York, 2009.
3. Alexander Soifer, *The Scholar and the State: In Search of Van der Waerden*, Springer Birkhäuser, Basel, 2015.