ONE HUNDRED TWENTY-ONE DAYS
CHOOSING TO WRITE FICTION

by

Michèle Audin

Recently, after a series of books and papers on the history of the mathematical community (this is not exactly the same as the history of mathematics), from ±1914 to ±1950, I decided to write a novel, *Cent vingt et un jours*. [1]

In this paper, I explain why and how I chose fiction. Let me start by quoting the back cover of the book:

> In this book, there are men and wars. There are also women who try to stay strong. There is a research project, archival documents, letters, photographs, private journals, numbers, testimonials, and the notes taken by the historian conducting this research.
>
> There is great history and personal history, love, war, crimes, hell, death. There are Germans, students, a madman, a "broken face," historians, a nurse, a determined teenage girl, mathematicians, doctors. There is the twentieth century, from colonial Africa to Paris of 1945, by way of the battlefields of the Great War, a psychiatric ward, Strasbourg and Clermont-Ferrand in

1. This was published by Gallimard as [**11**]. An English edition, *One Hundred Twenty-One Days* [**16**], translated by Christiana Hills, will be published by Deep Vellum in 2016. The translation of the back cover below was also written by Christiana Hills.

1939, occupied Paris, and a small town in Germany. There is literature, since, in the end, the historian decides to write a novel. Could it be this one?

Michèle Audin

l'arbalète gallimard roman Cent vingt et un jours

Before I come to the novel itself, I shall make a list of the historical subjects I was alluding to and which appear in this text, together with the kind of sources I used.

WWI and its consequences. This war killed almost 20% of the young soldiers... and 41% of the students from the . . . cole normale supérieure who were sent to war. It had enormous consequences on the history of the country and on that of mathematics and mathematicians. Working on the history of the iteration of rational functions

(between 1906 and 1920, say), I was impressed by the influence of the context, that is, the Great War, on the way the various protagonists worked. The fact that the young mathematician Gaston Julia was a "broken face," the fact that many of the senior mathematicians' sons were killed in the war, played a role in the questions of a strictly scientific nature: the way the mathematical papers of Gaston Julia and Pierre Fatou were written, were published, the way the priority questions were handled...

The war had also "side effects." André Bloch, for instance, committed a triple family murder after having been wounded in the war. He was sentenced to spend the rest of his life in a psychiatric ward rather than in a jail because he was a soldier. There, he started to work on mathematics. He corresponded with many mathematicians and wrote several research papers. A mathematical constant was named after him (and the exact value of this constant has still not been determined). (2)

Mathematical life in France in the thirties. The fact that so many young people and young scientists were killed or injured had numerous consequences, in particular on French scientific life in the thirties (Germany and England were more careful with their "elites"). This is one of the reasons that led to the founding of the Bourbaki group in 1935. I was lucky enough to help the Cartan family to sort Élie and Henri Cartan's archives after the death of the latter, (3) so that I had access to a huge amount of documents.

From this emerged the correspondence between Henri Cartan and André Weil, two founding members of Bourbaki, and an extensive study and publication of the talks that took place at one of the very first mathematical seminars in Paris, the "Julia Seminar." (4)

Fascism in Europe. The thirties were also the time of Fascicm's growth and expansion in Europe. Mathematicians had to face this

2. On the history of the iteration problem, see [**5**]; on that of André Bloch, see [**13**].

3. Élie Cartan (1869–1951) and his son Henri (1904–2008) were mathematicians.

4. The correspondence went on from 1928 to 1991. This makes for a (huge) book of 750 pages (including 250 pages of notes), [**4**]. Related to this is the paper [**6**]. The Julia Seminar is the book [**12**].

reality like everyone else. And, in this critical situation, they behaved like everyone else.

In Italy. Because I was wondering, "How do we behave in a critical situation like this?" I looked at the example of the oath Italian university professors had to sign in 1931. I wrote a very brief paper on this, titled "Would I have signed?" This (oath of allegiance) happened in 1931. The situation grew worse during the thirties. Then came another form of the question: "If I am invited to a scientific conference but my Jewish (or black, or Muslim) colleagues are not, what do I do?." This happened (with the Jewish case) in 1939 when (some) Italian mathematicians organized a *Convegno Volta* on geometry in Rome—which never took place, because of the war.

In Germany. Here, the German Mathematical Society itself decided to expel its Jewish members. This is something we should never forget. The way mathematics itself was used by the third Reich is also terrible. I had a careful look at some German school books (the actual school books used by the children in Nazi Germany). There will be examples below. (5)

WWII. But I was mainly interested in France, and all of this began with my specific research into the way French Jewish scientists were forbidden to publish in Vichy France. The French exclusion laws did not actually forbid scientific publications to Jews, but they were indeed excluded, e.g. from the *Comptes rendus de l'Académie des sciences*. I wrote a precise account of this in the paper "Publier sous l'Occupation," in which I focused on the case of mathematician Jacques Feldbau (1914–1945) (the one who proved that a locally trivial bundle over a contractible base is indeed trivial), and at the same time I wrote a biography of this young man, first excluded from teaching, then from publishing, then deported and murdered. (6)

I also looked, after having worked on the Cartan-Weil correspondence, at how André Weil (wrote in jail and) published a famous

5. This led to four papers published by the "general interest" online journal "Images des mathématiques" [**9, 15, 3, 10**].

6. The papers are [**1, 17**] and the biography is [**2**] (translated in German as [**7**]). See also [**14**].

Comptes rendus note in 1940, and the way in which this note was reviewed in the German *Jahrbuch* and *Zentralblatt*. This is a very instructive story of the way scientific discussion, here between the Frenchman André Weil and the German Helmut Hasse, is influenced by the war. (7)

Sources. For all this work, I used many sources of all kinds: the testimonies of Jacques Feldbau's friends, (8) newspapers (especially for the story of André Bloch), photographs, letters and various personal documents, (9) published papers, manuscripts (especially at the French Academy of Sciences), published scientific papers, published books on WWI, biographies of the protagonists (10)...

So many things I read and did not use... Then I decided to write a novel.

Fiction: why?

Of course, the main reason is my desire to write a novel.

The main characters of the book are two women and four men. I shall come back to the women later on. The men are all mathematicians. Two of them fight in the French army during WWI and are wounded, one in his face and the other in his head. The latter finishes his life in a psychiatric hospital. The former has a quite successful academic life and becomes, during the German occupation of France (1940-44), a collaborator. One of his German colleagues is the third of these characters. The fourth is a younger (French) mathematician, who is threatened by the French antisemitic laws and eventually dies in a German concentration camp.

A factual reason why I chose fiction is the following: I was thinking of publishing the scientific and personal correspondence between two

7. I was very happy that this was published... in a German journal [**8**].

8. Pierre and Yvonne Lévy, Simone Weiller.

9. Cartan Fonds and Weil fonds, archives of the French Academy of Sciences, Helmut Hasse Nachlass, University of G^ttingen, Ernest Fourneau Fonds, archives of the Pasteur Insitute.

10. André Weil's memories [**23**].

mathematicians, a Frenchman and a German, during WWII. I knew I would never get the family's permission: even now, not everybody in France is willing to publicize the fact that he or she had relatives who, seventy-five years ago, collaborated with the Germans. Note however that there were several books written by the daughters, sons or grandsons of such people. (11)

But, for the most part, there are theoretical reasons. The main one is the following. To say that Mr. X was a French "broken face" of WWI and then became, during WWII, a German collaborator, this is just an accusation against Mr. X. More than seventy years later, for what reason would this be useful? To tell that Mr X was a "bad guy"—does this include an implicit "but me, I am a good guy"? Isn't this exactly the opposite of what I want to say? Conversely, to say the same of a fictitious character makes the question more universal and more interesting: some broken faces were manipulated by German (Nazi) power and, through some vague pacifism, became collaborators, this seems to raise more significant questions.

This way, in the novel, all is true, but everything is fictional.

Fiction: how?

Well, this story is about mathematicians. I chose for them to be number theorists, although I myself am rather a topologist, because it is easier to speak of "numbers" than, e.g., of Riemann surfaces. Moreover, I wanted to show that numbers are not something abstract and objective, as many people believe they are. They are cultural products, like words. I was thinking of a sentence from Simone de Beauvoir: (12)

> There are words as murderous as gas chambers.

This is perfectly relevant: she wrote it in relation with the trial of Brasilliach, a French collaborationist, writer and journalist. The same is true of numbers, as the following exercise shows:

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11. Starting with Marie Chaix already in 1974 and in [**20**] (translated in English as [**21**]). Let me mention also the more recent [**22**].

12. In *La Force des choses* [**18**] (translated in English as [**19**]).

Exercise. The care of a mentally ill patient costs 8 Reichsmarks a day. How many Reichsmarks will this mentally ill patient cost after 40 years?

This is just a nice exercise on multiplication and division, taken in a German school book of the thirties. There are numbers as murderous as gas chambers...

This is why there is a whole chapter of *One Hundred Twenty-One Days* that acts as a kind of recapitulation of the numbers is the book:

29 days had the month of February in 1916
32 years, André's age when he died in Mariahilf
39, the number of survivors from the convoy in which Silberberg left
40 prisoners were housed in the barracks of the Cherche-Midi prison
41, the largest dimension for which K¸rz managed to demonstrate Silberberg?s lemma
42.8 meters cubed of rubble per person after the bombing of Dresden
48 hours that André and Sonntag marched side by side
...
including the answer to the previous exercise:

8000 meters high, they say, was the height reached by the flames after the bombing of Hamburg
14521.8 square kilometers of Germany were allocated to France by the Versailler Diktat
116800 Reichsmarks, would have been the cost a mentally ill patient if he had been looked after for forty years
157034 the number tattooed on a survivor?s arm and jotted down on a page from a blue notebook

This is also a historical novel. Hence the narrator is a historian, and the chapters of the book establish a list of all the material he used (newspapers, testimonies, diaries, photographs, and so on).

Let me add that the book has eleven chapters, that the number $121 = 11^2$ is in the title and that there is a square (this is made of circles

but this is indeed a square) on the (beautiful, French) cover. There are some reasons for that. The book's structure is based on an idea coming from medieval poetry. This is a kind of sestina, using the number eleven instead of six, say an eleventina.

Of wars and men—Women

Arma virumque cano—men at war, men and wars. What about women? There are two female characters in the novel. Both play the essential role of saying the unspekable. One is a Catholic nurse working in a military hospital during WWI and it is through her diary that the story of the injuries of the two young soldiers is told. The other one is a Jewish student and this is through her long wait for the return of the man she loves that the readers will learn the story of this young man's deportation and eventual death.

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References

[1] M. AUDIN – "Publier sous l'Occupation I. Autour du cas de Jacques Feldbau et de l'Académie des sciences", *Rev. Hist. Math.* **15** (2009), p. 5–57.

[2] ———, *Une histoire de Jacques Feldbau*, Collection T, Société mathématique de France, Paris, 2010.

[3] ———, "Une "vie brËve"de Max Dehn", *Images des Mathématiques, CNRS* (2010), En ligne `http://images.math.cnrs.fr/Une-vie-breve-de-Max-Dehn.html`.

[4] ———, *Correspondance entre Henri Cartan et André Weil*, Documents mathématiques, Société mathématique de France, Paris, 2011.

[5] ———, *Fatou, Julia, Montel, the Great Prize of Mathematical sciences of 1918, and Beyond*, Lecture Notes in Mathematics, 2014, Springer, 2011.

[6] ———, "Henri Cartan et André Weil Du vingtiËme siËcle et de la topologie", in *Henri Cartan & André Weil mathématiciens du* XX^{e} *siËcle*, X-UPS, Éditions de l'École Polytechnique, Palaiseau, 2012, p. 1–61.

[7] ———, *Jacques Feldbau Topologe Das Schicksal eines j¨dischen Mathematikers*, Mathematik im Kontext, Springer, 2012.
[8] ———, "La guerre des recensions (autour d'une note d'André Weil en 1940)", *Math. Semesterber.* **59** (2012), p. 243–260.
[9] ———, "Aurais-je signé?", *Images des Mathématiques, CNRS* (2013), En ligne `http://images.math.cnrs.fr/Aurais-je-signe.html`.
[10] ———, "Exercices de calcul... et de probabilités (en Allemagne il y a soixante quinze ans)", *Images des Mathématiques, CNRS* (2013), En ligne `http://images.math.cnrs.fr/Exercices-de-calcul-et-de.html`.
[11] ———, *Cent vingt et un jours*, l'ArbalËte, Gallimard, 2014.
[12] ———, *Le séminaire Julia*, cedram, 2014, en ligne `http://books.cedram.org/MALSM/`.
[13] ———, "Mathématiques en asile d'aliénés André Bloch (1893-1948)", *Images des mathématiques* (2014), en ligne `http://images.math.cnrs.fr/Mathematiques-en-asile-d-alienes`.
[14] ———, "Mathématiques ‡ Strasbourg-Clermont-Ferrand, Vivre, travailler, résister", *Revue d'Auvergne* **611** (2014), p. 123–137.
[15] ———, "Rome (ou pas?), 1939", *Images des Mathématiques, CNRS* (2014), En ligne `http://images.math.cnrs.fr/Rome-ou-pas-1939.html`.
[16] ———, *One Hundred Twenty-One Days*, Deep Vellum, 2016, Translated from the French by Christiana Hills.
[17] M. AUDIN & R. BRASSEUR – "Publier sous l'Occupation I. Addendum", *Rev. Hist. Math.* **17** (2011), p. 5–7, Addendum ‡ [**1**].
[18] S. D. BEAUVOIR – *La force des choses*, Galimard, Paris, 1963.
[19] ———, *Force of Circumstance*, Harper & Row, 1977, Translated from the French by Richard Howard.
[20] M. CHAIX – *Les lauriers du lac de Constance*, Seuil, Paris, 1974.
[21] ———, *The Laurels of Lake Constance*, Dalkey Archive Press, 2002, translated from the French by Harry Mathews.
[22] D. FERNANDEZ – *Ramon*, Grasset, Paris, 2009.
[23] A. WEIL – *The Apprenticeship of a Mathematician*, Birkhäuser, Basel, 1992, Translated from the French by Jennifer Gage.

MICHÈLE AUDIN, • *E-mail :* `michele.audin@math.unistra.fr`
Url : `http://oulipo.net/fr/oulipiens/ma`