

# the Bourbaki code

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## series 1

# THE BOURBAKI CODE

## 1.1 The wedding invitation

Andre Weil wrote about his arrest as a Russian spy in november 1939 :

”The manuscripts they found appeared suspicious - like those of Sophus Lie, arrested on charges of spying in Paris, in 1870. They also found several rolls of stenotypewritten paper at the bottom of a closet. When I said these were the text of a Balzac novel, the explanation must have seemed far-fetched. There was also a letter in Russian, from Pontrjagin, I believe, in response to a letter I had written at the beginning of the summer regarding a possible visit to Leningrad; and a packet of calling cards belonging to Nicolas Bourbaki, member of the Royal Academy of Poldavia, *and even some copies of his daughter Betti Bourbaki's wedding invitation*, which I had composed and had printed in Cambridge several months earlier in collaboration with Chabauty and my wife.”

I've always wondered how on earth the Finnish police could interpret mathematical texts as coded messages. Reading the 'faire-part' (attempted translation below) it is hard to view it as anything but a coded message...

Here it is : a translation and a copy of the 'faire-part' of Betti Bourbaki's wedding to Hector Petard, that nearly did cost Andre Weil's life.

Monsieur Nicolas Bourbaki, Canonical Member of the Royal Academy of Poldavia, Grand Master of the Order of Compacts, Conserver of Uniforms, Lord Protector of Filters, and Madame nee One-to-One, have the honor of announcing the marriage of their daughter Betti with Monsieur Hector Petard, Delegate Administrator of the Society of Induced Structures, Member of the Institute of Classified Archeologists, Secretary of the Work of the Lion Hunt.

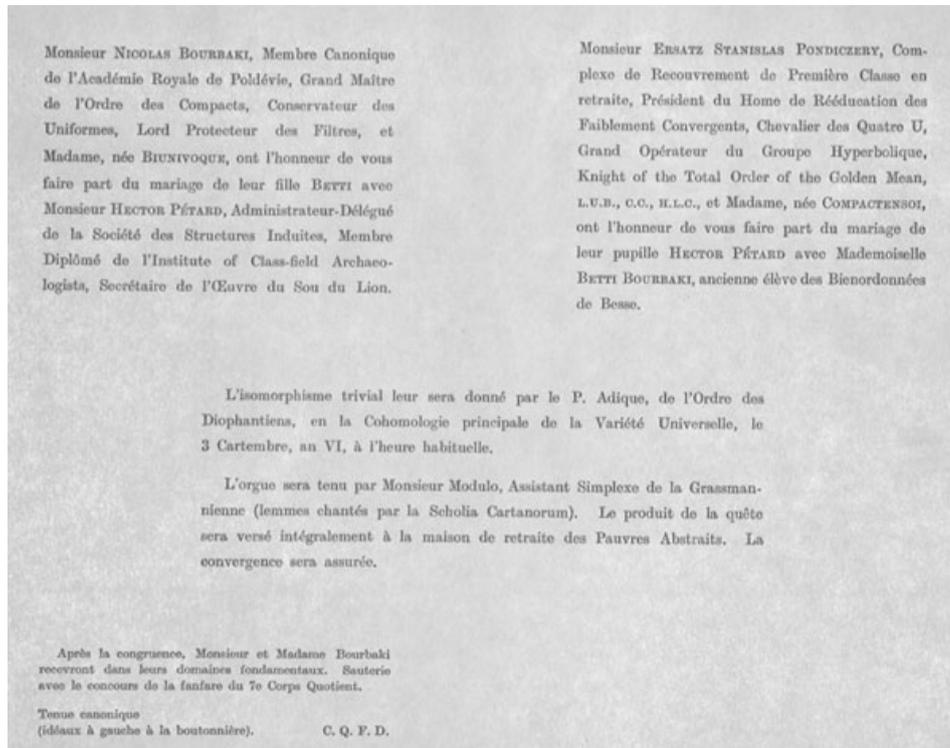
Monsieur Ersatz Stanislas Pondiczery, retired First Class Covering Complex, President of the Reeducation Home for Weak Convergents, Chevalier of the Four U's, Grand Operator of the Hyperbolic Group, Knight of the Total Order of the Golden Mean, L.U.B., C.C., H.L.C., and Madame nee Compact-in-itself, have the honor of announcing the marriage of their ward Hector Petard with Mademoiselle Betti Bourbaki, a former student of the Well-Ordereds of Besse.

The trivial isomorphism will be given to them by P. Adic, of the Diophantine Order, at the Principal Cohomology of the Universal Variety, the 3 Cartember, year VI, at the usual hour.

The organ will be played by Monsieur Modulo, Assistant Simplex of the Grassmannian (Lemmas will be sung by Scholia Cartanorum). The result of the collection will be given to the House of Retirement for Poor Abstracts, Convergence is assured.

After the congruence, Monsieur and Madame Bourbaki will receive guests in their Fundamental Domain; there will be dancing with music by the Fanfare of the VIIth Quotient Field.

Canonical Tuxedos (ideals left of the buttonhole). QED.



## 1.2 When was the Bourbaki wedding?

It's great fun trying to decode some of the puns contained in Betti Bourbaki's wedding invitation. Below a photograph, taken on May 13th 1939, of three of the practical jokers (from left to right : [Ralph Boas](#), [Frank Smithies](#) and [Andre Weil](#)), the others were [Claude Chabauty](#), Weil's wife Eveline and Louis Bouckaert (from Louvain).

Part of this picture is on the front cover of the book [Lion Hunting & other Mathematical Pursuits](#). This book clarifies the 'Secrétaire de l'Oevre du Sou du Lion'-phrase as well as some of the names on the card.

Inspired by the Bourbaki-hoax, a group of postdoctoral fellows visiting Princeton University in 1937-1938 (Boas, Smithies and John Tuckey) published their inventions, allegedly devised by Hector Pétard (aka 'H(oist) W(ith) O(wn) Petard' after the Shakespeare line "For 'tis the sport to have the engineer, hoist with his own petard..." Hamlet act III scene IV) who was writing under the pseudonym of E.S. Pondiczery. Pétard's existence was asserted in the paper "A Contribution to the Mathematical Theory of Big-Game Hunting" Amer. Math. Monthly 45 (1938) 446-447.

Smithies recalls the spring 1939 period in Cambridge as follows : "The climax of the academic year, as far as we were concerned, came in the Easter term. André Weil, Claude Chabauty, and Louis Bouckaert (from Louvain) were all in Cambridge, and the proposal was mooted that a marriage should be arranged between Bourbaki's daughter Betti and Hector Pétard; the marriage announcement was duly printed in the canonical French style - on it Pétard was described as the ward of Ersatz Stanislas Pondiczery - and it was circulated to the friends of both parties. A couple of weeks later the Weils, Louis Bouckaert, Max Krook (a South African astrophysicist), Ralph and myself made a river excursion



Fig. 1.1: Boas, Smithies and Weil at the Red Lion

to Grantchester by punt and canoe to have tea at the Red Lion; there is a photograph of Ralph and myself, with our triumphantly captured lion between us and André Weil looking benevolently on.”

From this and the date of the photograph (May 13th 1939) one can conclude that the marriage-card was drawn up around mid april 1939. As weddings tend to follow their announcement by a couple of months, this contradicts the following passage from [Notice sur la Vie et l'oeuvre de Nicolas Bourbaki](#) by an unidentified author :

turs de sa pensée. Nommé Privat-Dozent à l'Université de Dorpat en 1913, il s'y marie deux ans plus tard; une seule fille, Betti, mariée en 1938 au chasseur de lions H. Pétard, est née de cette union. La guerre de 1914-18 vint interrompre l'activité scientifique de N. Bourbaki, qui s'annonçait si féconde. Au moment de la révolution de 1917, il se trouve au Caucase,

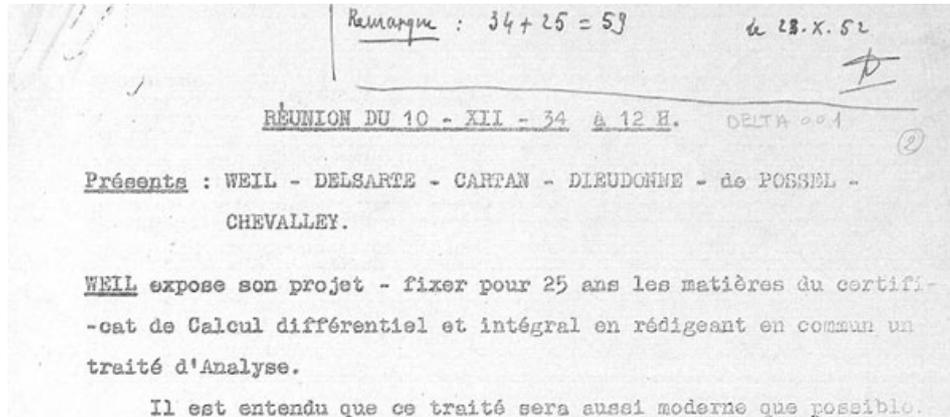
”Nominated as Privat-Dozent at the University of Dorpat in 1913, he (that is, N. Bourbaki) married two years later; a single girl, Betti, married in 1938 to the Lion hunter H. Pétard, was born out of this marriage.”

But then, when was the Bourbaki-Pétard wedding scheduled? Surely, a wedding announcement should provide that information. Here's the relevant part :

L'isomorphisme trivial leur sera donné par le P. Adique, de l'Ordre des Diophantiens, en la Cohomologie principale de la Variété Universelle, le 3 Cartembre, an VI, à l'heure habituelle.

”The trivial isomorphism (aka the sacrament of matrimony) will be given to them by P. Adic, of the Diophantine Order, at the Principal Cohomology of the Universal Variety, *the 3 Cartember, year VI, at the usual hour.*”

Here's my guess : the first Bourbaki-meeting took place December 10th 1934. Actually, it was a 'proto-Bourbaki-meeting', but nevertheless founding members such as [Jean Delsarte](#) counted 1934 as the first Bourbaki year as is clear from the 'Remarque' at the top of his [notes of the first meeting](#) :  $34+25=59$ , trying to figure out when the 25-year festivity was going to be held ...



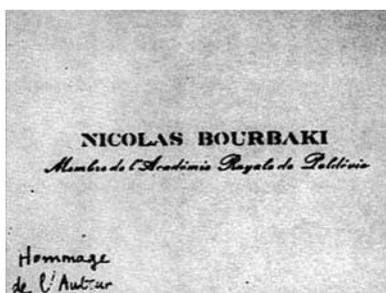
Thus, if 1934 is year 1 of the Bourbaki-calender, year VI should be 1939. The notules also give a hint of 'the usual hour'. In the 1934-1940 period, the Bourbakis met twice a month before the monday-afternoon seminar, at 12 o'clock sharp, the 'sacred hour', for a meeting over lunch.

Remains the 'Cartembre'-puzzle. We know 'Septembre (7), Novembre (9), Decembre (10)' so if 'Cart' is short for 'Quatre' (4), Cartembre might be June. I guess the wedding was scheduled to be held on *June 3rd, 1939 at 12h*.

It fits with the date the announcement was drawn up and June 3rd, 1939 sure enough was a saturday, the 'canonical' day for a wedding. Remains the problem of the wedding *place*. Suggestions anyone?

### 1.3 The Royal Poldavian Academy

Among the items found on Andre Weil at the time of his arrest was a packet of calling cards belonging to Nicolas Bourbaki, member of the Royal Academy of Poldavia.



But then, where is the Royal Poldavian Academy situated? Well, surely in the Kingdom of Poldavia, which is a very [strange country](#) indeed, its currency unit being the bourbaki and there exist only two types of coins: gold ones (worth  $n$  bourbakis) and silver ones (worth  $m$  bourbakis). Using gold and silver coins, it is possible to obtain sums such as 10000 bourbakis, 1875 bourbakis, 3072 bourbakis, and so on. Prove that any payment above  $mn-2$  bourbakis can be made without the need to receive change.

However, the Kingdom of Poldavia isnt another Bourbaki concoction. The name goes back at least to a joke pulled by the right-wingers of the [Action](#)

[Francaise](#) in may 1929. Heres the [TIME article of May 20th 1929](#):

“When 28 French Republican deputies sat down to their breakfast coffee and croissants early last week, each found a large crinkly letter from Geneva in his mornings mail. Innocent and refreshed after a sound nights sleep, not one Republican deputy saw anything untoward in the fact that the large crinkly letters were embossed on the stationery of Foreign Minister Lamidaeff, of the Kingdom of Poldavia. They saw nothing strange in the fact that Poldavians were in financial difficulties, and they found Minister Lamidaeff most thoughtful in not asking for money, but merely for an expression of moral support from the Deputies in his campaign to aid Poldavian sufferers. We believe that our interests were betrayed at the Peace Conference, wrote Poldavian Lamidaeff. and we appeal to you as a member of the French Parliament to do your utmost to help us in this our hour of need. The whole nation of Poldavia and its noble monarch who disregarded personal safety in 1916, and joined France in her War for justice and righteousness, pray you to remember our sacrifices.

What could be fairer than that? Legislators all over the world are always ready to write enthusiastic platitudes in favor of anything that sounds like a good cause. The wronged Poldavians seemed a very good cause. Each of the 28 deputies sat down at his desk and pledged his moral support to Foreign Minister Lamidaeff of Poldavia.”

None of the 28 deputies noticed that the old Poldavian name of Lamidaeff might read IAmi dA. F.the friend of A. F., the friend of l’Action Française famed royalist newspaper of which the editor is Leon Daudet, bon vivant, practical jokester, son of famed Author Alphonse Daudet (Tartarin de Tarascon), exile from the republic he has so consistently lampooned (TIME, June 13, 1927, et seq.). Three days after the 28 gullible deputies replied to the Poldavian Minister, a special edition of l’Action Française appeared.

People of France, wrote exiled Editor Daudet, who once escaped from La Sante prison through a hoaxed release order telephoned from the office of the Minister of the Interior, People of France, how much longer will you permit such ignorant deputies to represent you before the world? Here are 28 of your elected representatives, and they actually believe there is a Kingdom of Poldavia, and that Lamidaeff is its Foreign Minister. Lamidaeff, cest moi!”



The consul of Poldavia also appears in the 1936 Tintin-story [The Blue Lotus](#) by [Hergé](#). In view of the above AF-connection, it shouldn’t come as a surprise that Hergé is often accused of extreme-right sympathies and [racism](#).

To some, Poldavia is a small country in the [Balkans](#), to others it lies in the [Caucasus](#), but has disappeared from the map of Europe. All accounts do agree on one point, namely that Poldavia is a mountainous region.

Today we are pleased to disclose the exact location of the Royal Poldavian Academy, and, thanks to the wonders of [Google Earth](#) you can explore the Kingdom of Poldavia at your leisure if you give it the coordinates 45.521082N,2.935495E. Or, you can use the Google-map of [Figure 1.3](#) :

The evidence is based on a letter sent by Andre Weil to [Elie Cartan](#) when the Bourbakis wanted to submit a note for the [Comptes Rendus des Séances Hebdomadaires de](#)

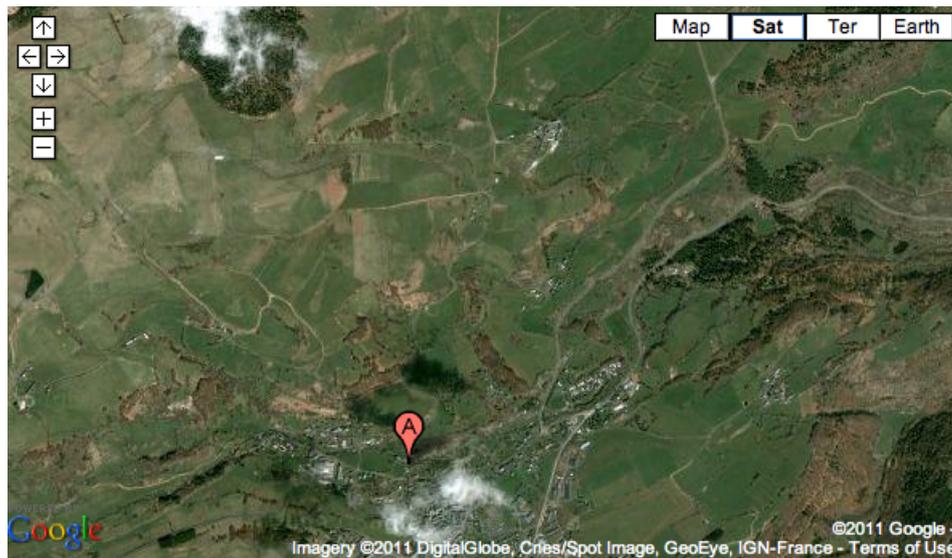


Fig. 1.2: The Land of Poldavia

[l'Académie des Sciences](#) under the pseudonym Nicolas Bourbaki. As the academy requires a biographical note on the author, Weil provided the following information about Bourbakis life :

Cher Monsieur,

Je vous envoie ci-joint, pour les C.R., une note que M.Bourbaki ma chargé de vous transmettre. Vous nignorez pas que M.Bourbaki est cet ancien professeur *l'Université Royale de Besse-en-Poldévie*, dont jai fait la connaissance il y a quelque temps dans un café de Clichy où il passe la plus grande partie de la journée et mme de la nuit ; ayant perdu, non seulement sa situation, mais presque toute sa fortune dans les troubles qui firent disparatre de la carte d'Europe la malheureuse nation poldève, il gagne maintenant sa vie en donnant, dans ce café, des leçons de belote, jeu où il est de première force.

Il fait profession de ne plus soccuper de mathématiques, mais il a bien voulu cependant sentretenir avec moi de quelques questions importantes et mme [ajout manuscrit : me laisser] jeter un coup dil sur une partie de ses papiers ; et jai réussi le persuader de publier, pour commencer, la note ci-jointe, qui contient un résultat fort utile pour la théorie moderne de l'intégration, je pense que vous ne verrez pas de difficulté l'accueillir pour les Comptes-Rendus ; si mme les renseignements que je vous donne au sujet de M.Bourbaki ne paraissent pas suffisamment clairs, j'imagine quil nappartient l'Académie, et en particulier celui qui présente la note, que de sassurer de la valeur scientifique de celle-ci, et non de faire une enquete au sujet de l'auteur. Or jai examiné soigneusement le résultat de M.Bourbaki, et son exactitude est hors de doute.

Veillez recevoir, je vous prie, les remerciements de M.Bourbaki et les miens, et croyez toujours mes sentiments bien affectueusement et respectueusement dévoués. A.Weil

That is, Besse-en-Poldevie, or simply Besse as in this line from the wedding announcement Mademoiselle Betti Bourbaki, a former student of the Well-Ordereds of Besse must be the capital of Poldavia where the Academy is housed.

You may have never heard of Poldavia, but if you are a skiing or cycling enthusiast, the name of its capital sure does ring a bell, or rather so does the name of its sub-part [Super Besse](#). The winter sports resort of Super Besse is located in the commune of [Besse-et-](#)

[Saint-Anastaise](#) in the Parc naturel régional des volcans d'Auvergne in the department of Puy de Dôme, in Auvergne. Situated approximately 50 km from Clermont-Ferrand, it is located at an altitude of 1350 m on the slopes of Puy de Sancy, Puy de la Perdrix and Puy Ferrand. Surely a mountainous region

Besse-et-Saint-Anastaise, or rather Besse-en-Chandesse as it was formerly called, was the venue of the very first [Bourbaki Congress 1935](#). Surely, they used the Royal Poldavian Academy as their meeting place. But, where is it?



At the Besse meeting were present : [Claude Chevalley](#), [Jean Dieudonné](#), [René de Possel](#), [Henri Cartan](#), [Szolem Mandelbrojt](#), [Jean Delsarte](#), [André Weil](#), the physicist [Jean Coulomb](#), [Charles Ehresmann](#) and a cobaye called Mirles.

Of these men three held a position at the University Blaise Pascal of Clermont-Ferrand : Mandelbrojt, de Possel and Coulomb and they arranged that the Bourbaki-group could use the universities biology-outpost in Besse-en-Chandesse. Photographic evidence for this is provided by the man standing apart in the right hand-picture above : the biologist Luc Olivier.

Concluding : the Royal Poldavian Academy is located at the *Station Biologique de l'Université Blaise Pascal*, *Rue du Lavoisier, Besse-et-Saint-Anastaise*.

On July 12th 2003 a ceremony was held at the Biology-station commemorating the birth of Nicolas Bourbaki (the group), supposedly born July 12th 1935. A [plate](#) at an exterior wall of the Biology-station was unveiled.

More information about the mysterious country of Poldavia can be found in the article [La vérité sur la Poldévie](#) by Michele Audin.

## 1.4 Where was the Bourbaki wedding? (1)

I'm pretty certain I got the intended date & time of the Bourbaki-Pétard wedding right : June 3rd 1939 at 12h. Finding the exact location of the wedding-ceremony is an entirely

different matter. And, quite probably, we are reading way too much in these pranks of the Weil-clan.

Still, it's fun trying to find an elegant answer, based on the (intended or imagined) clues in the text and the little we know about the early Bourbaki-days. Here, the translation of the relevant part of the wedding announcement :

"They will receive the trivial isomorphism from P. Adic, of the Order of the Diophantines, in the Principal Cohomology of the Universal Variety, on the third of Cartember, year VI, at the usual hour.

The organ will be played by Monsieur Modulo, Assistant Simplex of the Grassmannian (with lemmas sung by the Scholia Cartanorum). The collection will be donated in full to the retirement home for Poor Abstracts. Convergence will be guaranteed."

*First solution* : Perhaps one might read "in the Principal Cohomology of the Universal Variety" as : "in the Principal Church of the generic type/name". In many French cities the main church is the Cathedral and an awful lot of them are called Notre Dame, so it might mean : in the Notre Dame Cathedral. But even then, we have to choose between these two



On the left, the [Notre Dame Cathedral in Paris](#). On the right the [Cathédrale Notre-Dame-de-l'Annonciation in Nancy](#). As the invitation promises guests to be entertained after the ceremony by Monsieur et Madame Bourbaki at their 'Fundamental Domains', the choice depends on the location of the Bourbaki-household in June 1939.

'Bourbaki' made two applications to become an AMS-member. The first, in 1948, tells us that Bourbaki is a scientific advisor to the Hermann Publishing Co. in Paris since 1934, and, the second in 1950, that he is 'Directeur Libre de Recherches a l'Université de Nancy'. I couldn't find out when exactly Nicolas did change cities, and even Liliane Beaulieu's talk [Bourbaki a Nancy](#) does not provide an answer.

*Second solution* : Or, one can read that sentence as a mathematical, perhaps proto-motivic, statement, and, hunt for clues elsewhere in the text. But then, what are these clues?

- Mass is celebrated by "P. Adic, of the Order of the Diophantines". This suggests that the church itself belongs to a monastic order, and is perhaps a convent-church.

- Hymns are "sung by the Scholia Cartanorum". Scholia Cartanorum is Latin of sorts and refers perhaps to the Paris' Latin Quarter, [le Quartier Latin](#).
- The collection is donated to the "retirement home for Poor Abstracts". Perhaps the church is connected to a saint for the poor.



Let's consider "Scholia Cartanorum" more closely. It may be Latin, admittedly very bad Latin, for 'the Scholiums of Cartesius', that is, 'of [Descartes](#)'.

One of the more famous 'Scholia' in scientific history is [Newton's general scholium to the Principia](#), which is a prime example of Descartes-bashing. Newton attacks Descartes on his vortical theory of planetary motion, his aether to explain gravity, his God-axiom (unlike Descartes, Newton induced God from nature, rather than starting with God as an axiom) and his hypothetico-deductive method. So, there is a link between Descartes and 'Scholium', although the genitive form 'Cartesiorum' might be fairly inappropriate...

But then, Descartes died on 11 February 1650 in Stockholm (Sweden) where he was buried, so there won't be a connection to a French or Parisian church, right? Well, not quite. The fate of Descartes' remains is a rather [strange story](#) : "In 1666, sixteen years after his death, the bones of René Descartes were dug up in the middle of the night and transported from Sweden to France under the watchful eye of the French Ambassador. This was only the beginning of the journey for Descartes' bones, which, over the next 350 years, were fought over, stolen, sold, revered as relics, studied by scientists, used in séances, and passed surreptitiously from hand to hand. " For example, during the French Revolution, his remains were disinterred for burial in the Pantheon in Paris among the great French thinkers. But today, his ashes are buried in...

the abbey church of [Saint-Germain-des-Prés](#), located in the Quartier Latin, within walking distance of the Bourbaki-café Capoulade and the [Ecole Normale Supérieure](#).

Now all the hints fall handsomely in place. St-Germain-des-Prés is the oldest church in Paris. Parts of it date to the 6th century, when a [Benedictine](#) abbey was founded on the site by Childebert, son of Clovis. Hence the sentence 'in the Principal Cohomology of the Universal Variety' might simply mean 'in the first church, ever'. In medieval times, the Left Bank of Paris was prone to flooding from the Seine, so much of the land could not be built upon and the Abbey stood in the middle of fields, or prés in French, thereby explaining its appellation.

The other part of its name, Saint Germain, comes from [Saint Germanus of Paris](#), also known as the 'father of the poor' (!). His remains were interred in



St. Symphorien's chapel in the vestibule of St. Vincent's church, but in 754, when he was canonized, his relics were solemnly removed into the body of the church, in the presence of Pepin and his son, Charlemagne, then a child of seven, and the church was reconsecrated as Saint-Germain-des-Prés. That is, also the remains of the 'father of the poor' are buried in this church.

Here's my best guess : *the Bourbaki-Pétard wedding was held on June 3rd 1939 in the church Saint-Germain-des-Prés at 12h.* Genuine aficionados of [the Da Vinci code](#) may regret it wasn't held in the neighboring [Saint-Sulpice church](#), but then, perhaps someone can bend the clues accordingly...

Remains this problem : who was the organist, Monsieur Modulo? Suggestions anyone?

## 1.5 Towards the first Bourbaki congress

Because Mandelbrojt, de Possel and Coulomb all held a position at the University Blaise Pascal of Clermont-Ferrand I assumed that the Bourbaki-group had no problem procuring the universities biology-outpost in Besse-en-Chandesse for their first congress in 1935. However, the [relevant Bourbaki files](#) tell a different story. As might have been expected, the project suffered from the 'usual' inter-departmental fighting, but also from a power-struggle within the group itself.



Fig. 1.3: Capoulade

An excellent account of the first 10 'proto-Bourbaki' meetings in the Capoulade-Café, 63 boulevard Saint-Michel, is told magnificently by Liliane Beaulieu in her 1993 paper [A Parisian Café and Ten Proto-Bourbaki Meetings\(1934-1935\)](#). Here we will concentrate on the preparations of the Besse congress.

At their very first meeting on december 10th 1934, they already state the importance of the upcoming summer-congress where a precise plan and a distribution of the writing-load for the first volumes will be discussed : "Aux prochaines grandes vacances aura lieu une réunion plénière d'ou sortira un plan définitif tres précis et

une répartition du travail de rédaction des différents fascicules". The second meeting, on january 14th 1935, decides that the definite list of Bourbaki-members will consist of those (among the nine 'possibles' Weil, Delsarte, Mandelbrojt, Cartan, Dubreil, Dieudonné, de Possel, Chevalley and Leroy) present at the congress : "Il est entendu que la liste définitive, extraite de la précédente, sera composée des noms des membres présents a la réunion plénière d'Aout ou Septembre prochain, réunion dans laquelle sera dressé le plan définitif et précis du traité".

On march 25th 1935, the first precise plans are made about the location, the lodgings and the extremely important issue of the meals which will be taken in a nearby Hotel of which "la cuisine est, parait-il, fort bonne".

1°) Réunion plénière de 1935. A la suite d'une proposition antérieure de de POSSEL, la majorité des membres présents se déclare favorable à ce que la réunion ait lieu à BESSE, village qui se trouve à environ 40 km de CLERMONT. Le service de botanique de la Faculté des Sciences de Clermont possède en ce lieu un immeuble capable de loger les membres du Comité dans de bonnes conditions et pour un prix minime. Les repas seraient pris dans l'hôtel du pays où la cuisine est, paraît-il, fort bonne. CHEVALLEY et DIEUDONNÉ font des objections d'ordre personnel ; après une discussion un peu longue, voici ce qui est décidé : de POSSEL est chargé de prévenir qui de droit, de la grande probabilité d'une réunion de mathématiciens à Besse, du 12 au 25 juillet prochain ; il doit de plus indiquer à la prochaine réunion du comité la date ultime jusqu'à laquelle nous avons le droit de changer d'avis. Tant que cette date ne sera pas atteinte, toute autre proposition peut être faite.

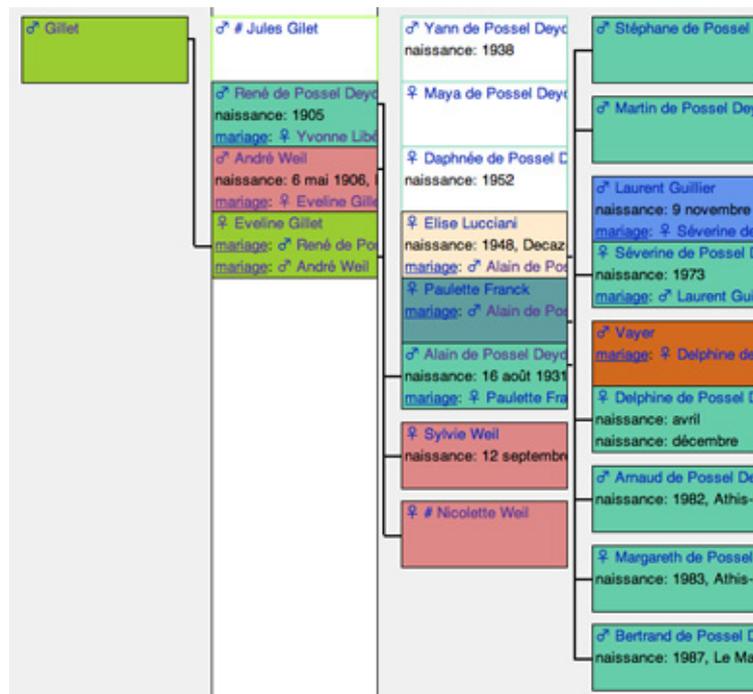
René de Possel obtained a mandate to do whatever it took for the group to have their congress in Besse between 12 and 25 July, and, to enquire until what date they could still change their mind. His [biography](#) contains the following lines : "On many issues de Possel and André Weil were on opposite sides in the arguments. At the first Bourbaki congress in July 1935 de Possel was still an active member of the group and much involved with contributing but, largely due to differences with Weil, he dropped out of the project. De Possel married Yvonne Liberati on 12 August 1935; they had three children, Yann, Maya, and Daphné."

By and large, the Bourbaki-differences between de Possel and Weil were of a professional nature. They had different mathematical interests, different mathematical talents, different ambitions, and, a different level of commitment wrt. the work ahead (Weil being the lazier one of the two). Still, it is difficult to understand the group-dynamics of the first generation Bourbakis without mentioning a personal tragedy, often 'forgotten' (as in the above biography) or given no more than half a sentence, in passing...

Aged 24, René de Possel marries Evelyne Gillet in 1929 and their son, Alain, is born on august 16th 1931. However, the marriage breaks up, one account dates the separation in 1933, another around the time of the Besse conference in 1935.

What is certain is that Evelyne Gillet and André Weil start a relationship no later than the autumn of 1935. At that time, Weil is concocting the Bourbaki Comptes-Rendus note and as the Academy demands a short biography of the author, he has to come up with a first name (at the Besse conference, they only decided on the name 'N. Bourbaki'). Evelyne chooses Nicolas and is referred to ever after as 'Bourbaki's godmother'. Early 1936, the couple spends a vacation together in Spain.

Early 1937, the official divorce papers come through, allowing Weil and Evelyne to marry on october 30th 1937. The very same year, René de Possel remarries with Yvonne Liberati. For more information, you can traverse Evelyne's genealogy-tree [here](#), but bear in mind that not all information is included (for example, Evelyne died on may 24th, 1986).



Contrary to the suggestion made in the biography, there is no evidence that de Possel left the Bourbaki-group as a result of this affair or because of his arguments with Weil. In fact, at least until the second Chançay-congress in 1937, de Possel was one of the hardest workers in the group, present at all meetings, doing his share of the write-up and even chastising his fellow-Bourbakis for not being as committed to the project as they ought to be, see for example the [7 theses of Chançay document](#). It was only in the fall of 1941 that de Possel asked to be transferred to the university of Algiers and left the Bourbaki-group.

De POSSEL transmet au comité une proposition du célèbre fantaisiste : Paul VALÉRY qui, en tant que fondateur du centre universitaire méditerranéen, accepterait de recevoir gratuitement les membres du comité rédacteur lors de la prochaine réunion plénière: logement et couchage seraient assurés par l'école hôtelière de Nice; certaines facilités de pension seraient possibles. Nous aurions toute latitude sur le choix de l'époque, entre juillet et octobre. - VALÉRY, pour des raisons obscures, exigeait que de POSSEL fasse fonction de président du comité pendant la durée de la réunion plénière.- Ces propositions quoique manquant de précision et présentant un caractère un peu arbitraire, méritent considération. Le climat serait peu favorable en juillet et août. Certaines difficultés de personnes se présentent en septembre. On décide de remettre la décision à la prochaine réunion.

At the meeting of march 25th 1935, de Possel attempts a coup d'état. He comes up with an entirely new plan for the summer-congress. [Paul Valéry](#), the French poet, essayist, and philosopher (in the notules he is described as 'le célèbre fantaisiste') proposed the Bourbaki-group to use his 'centre universitaire méditerranéen' (the proto-University of Nice) as their place of venue. They could choose any period between July and October

and they wouldn't have to pay a thing! de Possel was in contact with Valéry at that time, he was writing a 44 page booklet on game theory [Sur la théorie mathématique des jeux de hasard et de réflexion](#), with a preface by Paul Valéry, which appeared later in 1937 via Valéry's center for mediterranean studies.

There is one small catch though ... Valéry insists that de Possel should be president of the Bourbaki-group during the meeting! Naturally, this wasn't received enthusiastically by the others, but they didn't rule the plan out, requesting additional information and observing that july and august may be way too hot in Nice.

The next meeting (May 6th 1935), de Possel tries to increase the pressure by asserting that the original Besse-plan is in danger because "Les naturalistes de Clermond-Ferrand semblent vouloir se servir de ce qui leur appartient" (the biologists of Clermond-Ferrand want to use their facilities themselves). But the others are not impressed and they give de Possel "pleins pouvoirs pour réagir avec violence."

A fortnight later, Weil demands to know the latest on the Besse-negotiations and de Possel replies "en principe les biologistes de Clermond-Ferrand pourront y séjourner des le 15 juin, il y a tout lieu de présumer que ces derniers ne seront que trois ou quatre; ils seront donc fort peu gênante étant donné le nombre des locaux dont nous pourrions disposer", that is, there won't be more than 3 or 4 biologists around, and, there's plenty of room for everyone!

Putsch averted, the Bourbakis can start packing their suitcases, hire a secretary for the meeting, and split the costs among all committee-members. Because even [this circulaire](#) is preserved, we now know such trivia as the cost of full-pension in the Besse-Hotel with the excellent kitchen : 25 Ffr/day...

## 1.6 Where was the Bourbaki wedding? (2)

A few days before Halloween, [Norbert Dufourcq](#) (who died december 17th 1990...), sent me a [comment](#), containing lots of useful information, hinting I did get it wrong about the church of the Bourbaki wedding in the [previous post](#).

Norbert Dufourcq, an organist and student of [Andre Machall](#), the organist-in-charge at the Saint-Germain-des-Prés church in 1939, the place where I speculated the Bourbaki wedding took place, concluded his comment with :

*"P.S. Lieven, you do know about the Schola Cantorum, now, don't you?!?"*

Euh... actually ... no, I did not ...

[La Schola Cantorum](#) is a private music school in Paris. It was founded in 1894 by Charles Bordes, Alexandre Guilmant and Vincent d'Indy as a counterbalance to the Paris Conservatoire's emphasis on opera. Its alumni include many significant figures in 20th century music, such as [Erik Satie](#) and [Cole Porter](#).

[Schola Cantorum](#) is situated 69, rue Saint Jacques, Paris, just around the corner of the [Ecole Normal Supérieure](#), home base to the Bourbakis. In fact, closer investigation reveals striking similarities and very close connections between the circle of artists at la Schola and the Bourbaki group.

In december 1934, the exact month the Bourbaki group was formed, a radical reorganization took place at the Schola, when Nestor Lejeune became the new director. He invited several young musicians, many from the famous Dukas-class, to take up teaching positions at the Schola.

Here's a picture of part of the [Dukas class of 1929](#), several of its members will play a role in the upcoming events : from left to right next to the piano : Pierre Maillard-Verger, Elsa



Fig. 1.4: Schola Cantorum

Barraine, Yvonne Desportes, Tony Aubin, Pierre Revel, Georges Favre, Paul Dukas, René Duclos, Georges Hugon, Maurice Duruflé. Seated on the right : Claude Arrieu, Olivier Messiaen.



The mid-1930s in Paris saw the emergence of two closely-related groups with a membership which overlapped : La Spirale and [La Jeune France](#). La Spirale was founded in 1935 under the leadership of Georges Migot; its other committee members were Paul Le Flem, his pupil André Jolivet, Edouard Sciortino, Claire Delbos, her husband [Olivier Messiaen](#), Daniel-Lesur and Jules Le Febvre.



The common link between almost all of these musicians was their connection with the Schola Cantorum. On the left : Les Jeunes Musiciens Français : André Jolivet on the Piano. Standing from left to right : Olivier Messiaen, Yves Baudrier, Daniel-Lesur.

Nigel Simeone wrote [this](#) about Messiaen and La Jeune France : "The extremely original and independent-minded Messiaen had already shown himself to be a rather unexpected enthusiast for joining

groups: in December 1932 he wrote to his friend Claude Arrieu about a letter from another musician, Jacques Porte, outlining plans for a new society to be called Les Jeunes Musiciens Français. Messiaen agreed to become its vice-president, but nothing seems to have come of the project. Six months later, in June 1933, he had a frustrating meeting with Roger Désormière on behalf of the composers he described to Arrieu as *les quatre*, all of them Dukas pupils: Elsa Barraine, *the recently-deceased Jean Cartan*, Arrieu and Messiaen himself; during the early 1930s Messiaen and Arrieu organised concerts featuring all four composers.”

Finally, we’re getting a connection with the Bourbaki group! Norbert Dufourcq mentioned it already in his comment “Messiaen was also a good friend of Jean Cartan (himself a composer, and Henri’s brother)”. [Henri Cartan](#) was one of the first Bourbakis and an excellent piano player himself.

The Cartan family picture on the right : standing from left to right, father [Elie Cartan](#) (one of the few older French mathematicians respected by the Bourbakis), Henri and his mother Marie-Louise. Seated, the younger children, from left to right : Louis, Helene (who later became a mathematician, herself) and the composer Jean Cartan, who sadly died very young from tuberculosis in 1932...



The december 1934 revolution in French music at the Schola Cantorum, instigated by Messiaen and followers, was the culmination of a process that started a few years before when Jean Cartan was among the circle of revolutionados. Because Messiaen was a fiend of the Cartan family, they surely must have been aware of the events at the Schola (or because it was merely a block away from the ENS), and, the musicians’ revolt may very well have been an example to follow for the first Bourbakis...(?!)

Anyway, we now know the intended meaning of the line “with lemmas sung by the Scholia Cartanorum” on the wedding-invitation. Cartanorum is NOT (as I claimed last time) bad Latin for ‘Cartesiorum’, leading to Descartes and the Saint-Germain-des-Pre church, but is in fact passable Latin (plur. gen.) of CARTAN(us), whence the translation “with lemmas sung by the school of the Cartans”. There’s possibly a double pun intended here : first, a reference to (father) [Cartan’s lemma](#) and, of course, to La Schola where the musical Cartan-family felt at home.

Fine, but does this brings us any closer to the intended place of the Bourbaki-Petard wedding? Well, let’s reconsider the hidden ‘clues’ we discovered last time : the phrase “They will receive the trivial isomorphism from  $P. Adic$ , of the Order of the Diophantines” might suggest that the church belongs to a religious order and is perhaps an abbey- or convent-church and the phrase “the organ will be played by Monsieur Modulo” requires us to identify this mysterious Mister Modulo, because Norbert Dufourcq rightfully observed :

”note however that in 1939, it wasn’t as common to have a friend-organist perform at a wedding as it is today: the appointed organists, especially at prestigious Paris positions, were much less likely to accept someone play in their stead.”



The [history](#) of La Schola Cantorum reveals something that might have amused Frank Smithies (remember he was one of the wedding-invitation-composers) : the Schola is located in the Convent(!) of the British Benedictines...

In 1640 some Benedictine monks, on the run after the religious schism in Britain, found safety in Paris under the protection of [Cardinal Richelieu](#) and [Anne of Austria](#) at [Val-de-Grace](#), where the Schola is now housed.

As is the case with most convents, the convent of the British Benedictines did have its own convent church, now called [l'église royale Notre-Dame du Val-de-Grace](#) (remember that one of the possible interpretations for "of the universal variety" was that the name of the church would be "Notre-Dame"...).

This church is presently used as the concert hall of La Schola and is famous for its ... [musical organ](#) : "In 1853, [Aristide Cavallé-Coll](#) installed a new organ in the Church of Sainte-geneviève which had been restored in its role as a place of worship by Prince President Louis-Napoléon. In 1885, upon the decision of President Jules Grévy, this church once again became the Pantheon and, six years later, according to an understanding between the War and Public Works Departments, the organ was transferred to the Val-de-Grace, under the supervision of the organ builder Merklin. Beforehand, the last time it was heard in the Pantheon must have been for the funeral service of Victor Hugo. In 1927, a raising was carried out by the builder Paul-Marie Koenig, and the inaugural concert was given by André Marchal and Achille Philippe, the church organist. Added to the register of historic monument in 1979, Val-de-Graces little great organ, as Cavallé-Coll called it, was restored in 1993 by the organ builders François Delangue and Bernard Hurvy. The organ of Val-de-Grace is one the rare parisian surviving witnesses of the art of Aristide Cavallé-Coll, an instrument that escaped abusive and definitive transformations or modernizations. This explain why, in spite of its relatively modest scale, this organ enjoys quite a reputation, and this, as far as the United States."



By why would the Val-de-Grace organiste at the time [Achille Philip](#), "organiste titulaire du Val-de-Grace de 1903 1950 et professeur d'orgue et d'harmonie la Schola Cantorum de 1904 1950", be called 'Mister Modulo' in the wedding-invitations line "L'orgue sera tenu par Monsieur Modulo"???

Again, the late Norbert Dufourcq comes to our rescue, proposing a good candidate for 'Monsieur Modulo' :

"As for modulo, note that the organist at Notre-Dame at that time, Léonce de Saint-Martin, was also the composer of a Suite Cyclique, though I admit that this is just wordplay: there is nothing modular about this work. Maybe a more serious candidate would be Olivier Messiaen (who was organist at the église de la Trinité): his modes transposition limitée

are really about  $\mathbb{Z}/12\mathbb{Z} \longrightarrow \mathbb{Z}/3\mathbb{Z}$  and  $\mathbb{Z}/12\mathbb{Z} \longrightarrow \mathbb{Z}/4\mathbb{Z}$ . ”

Messiaen’s ‘[Modes of limited transposition](#)’ were compiled in his book ‘[Technique de mon langage musical](#)’. This book was published in Paris by Leduc, as late as 1944, 5 years after the wedding-invitation.

Still, several earlier works of Messiaen used these schemes, most notably [La Nativité du Seigneur](#), composed in 1935 : ”The work is one of the earliest to feature elements that were to become key to Messiaen’s later compositions, such as the extensive use of the composer’s own modes of limited transposition, as well as influence from birdsong, and the meters and rhythms of Ancient Greek and traditional Indian music.”

More details on Messiaen’s modes and their connection to modular arithmetic can be found in the study [Implementing Modality in Algorithmic Composition](#) by Vincent Joseph Manzo.

Hence, Messiaen is a suitable candidate for the title ‘Monsieur Modulo’, but would he be able to play the Val-de-Grace organ while not being the resident organist?

Remember, the Val-de-Grace church was the concert hall of La Schola, and its musical organ the instrument of choice for the relevant courses. Now ... Olivier Messiaen [taught](#) at the Schola Cantorum and the école Normale de Musique from 1936 till 1939. So, at the time of the Bourbaki-Petard wedding he would certainly be allowed to play the Cavaillé-Coll organ.

Perhaps we got it right, the second time around : *the Bourbaki-Pétard wedding was held on June 3rd 1939 in the church ‘l’église royale Notre-Dame du Val-de-Grace’ at 12h?*

## 1.7 Where’s Bourbaki’s Escorial?

Early 1936, Andre Weil and Evelyne Gillet made a pre-honeymooning trip to Spain and visited [El Escorial](#). Weil was so taken by the place that he planned the next Bourbaki-conference to be held in a nearby college. However, the Bourbakis never made it to Spain that summer as the [Spanish Civil War](#) broke out July 17th, a few weeks before the intended conference. Can we GEO-tag the exact location of Bourbaki’s ”Escorial”?

As explained in the [bumpy-road-post](#), [Andre Weil](#) and Evelyne Gillet became involved sometime in 1935. Early 1936, they made a pre-honeymooning trip to Spain and visited El Escorial. Weil was so taken by the place that he planned the next Bourbaki-conference to be held in a nearby college.

[Claude Chevalley](#) came up with a Plan-B and suggested they would use his parents’ place in [Chançay](#) as their venue. Chevalley’s father was a French diplomat and his house sure did possess a matching ‘grandeur’ as can be seen from the famous picture below, taken at the (second) Chançay meeting in 1937 (Weil to the left, Chevalley to the right and Weil’s sister Simonne standing).

Olivier Messiaen's Modes of Limited Transposition Organized by number of scale degrees	
Messiaen 6 Note Collections	
o	2 2 2 2 2 2 Whole-tone, Messiaen mode 1
o	1 1 4 1 1 4 Messiaen mode 5
o	4 1 1 4 1 1 Messiaen mode 5 inverse
Messiaen 8 Note Collections	
o	1 2 1 2 1 2 1 2 Octatonic, Messiaen mode 2, Half-Whole step scale
o	2 1 2 1 2 1 2 1 Octatonic, Messiaen mode 2 inverse, Whole-Half step scale
o	1 1 1 3 1 1 1 3 Messiaen mode 4
o	3 1 1 1 3 1 1 1 Messiaen mode 4 inverse
o	1 1 2 2 1 1 2 2 Messiaen mode 6
o	2 2 1 1 2 2 1 1 Messiaen mode 6 inverse
Messiaen 9 Note Collections	
o	1 1 2 1 1 2 1 1 2 Messiaen mode 3
o	2 1 1 2 1 1 2 1 1 Messiaen mode 3
Messiaen 10 Note Collections	
o	1 1 1 1 2 1 1 1 1 2 Messiaen mode 7
o	2 1 1 1 1 2 1 1 1 1 Messiaen mode 7 inverse



Thanks to the [Bourbaki archives](#) we know that the meeting took place from september 16th to 28th, that each of them had to pay 16 francs for full pension and had to bring along their own sheets and towels.

11°/ - DATES DEFINITIVES : 16 et 17 Septembre : Arrivée des congressistes, prise de contact, conciliabules divers, établissement du programme.

18 au 28 inclus : Congrès

29 - post-congrès à Paris, rencontre de Coulomb.

NOTA - Il serait désirable que tout le monde soit là le 18 au matin.

111°/ - REMARQUES PRATIQUES : Prix de la pension : 16 francs par jours et par personne; que chacun amène une couverture et le nombre de serviettes de toilette qu'il juge nécessaire à sa propreté corporelle ( 2, d'après l'estimation de Chevalley) que chacun prévienne Chevalley à Chançay (I.&L.) de la date de l'heure, et du lieu de son arrivée, le transport des gares de Tours, St-Pierre des Corps Amboise à Chançay est assuré.

But where exactly is this beautiful house? Jacques Borowczyk has written a nice paper [Bourbaki et la touraine](#) in which he describes the Bourbaki congresses of 1936 and 1937 at the Chevalley-house in Chançay and further those held in 1956, 1957 and 1959 in 'htel de la Brèche' in Amboise.

Borowczyk places the Chevalley house in the little hamlet of Chançay, called "La Massoterie". The village files assert that in 1931 three people were living at La Massoterie : father Abel Chevalley, who took residence there after his retirement in 1931, his wife Marguerite and their son Claude. But, at the time of the Bourbaki congres in 1936, Marguerite remained the only permanent inhabitant. Sadly, Abel Chevalley, who together with Marguerite compiled the The concise Oxford French dictionary, died in 1934.

Usually when you know the name of the hamlet, of the village and add just to be certain 'France', [Google Maps](#) takes you there within meters. So, this was going to be a quick post, for a change... Well, much to my surprise, typing 'La Massoterie, Chançay, France'

only produced the answer "We could not understand the location La Massoterie, Chançay, France".

Did I spell it wrong? Or, did the name change over times? No, Googling for it [the first hit](#) gives you the map of a 10km walk around Chançay passing through la Massoterie!

Now what? Fortunately Borowczyk included in his paper an old map, from Napoleonic times, showing the exact location of La Massoterie (just above the flash-sign), facing the castle of Volmer. If you compare it with the picture below from present day Chançay (via Google earth) it is surprising how many of the landmarks have survived the changes over two centuries.



It is now easy to pinpoint the exact location and zoom into the Chevalley-house, and, you're in for a small surprise : the place is called *La Massoterie* with 2 t's...

Probably, Google's database is more reliable than the information provided by the village of Chançay, or the paper by Borowczyk as it is the same spelling as on the old Napoleonic map. Anyway, feel free to have a peek at Bourbaki's Escorial yourself!

## 1.8 Who was le P. Adique?

So far, we managed to solve the first few riddles of the Bourbaki code, but several mysteries still remain. For example, who was the priest performing the Bourbaki-Petard wedding ceremony? The 'faire part' identifies him as 'le P. Adique, de l'Ordre des Diophantiens'.

*L'isomorphisme trivial leur sera donné par le P. Adique, de l'Ordre des Diophantiens, en la Cohomologie principale de la Variété Universelle, le 3 Cartembre, an VI, à l'heure habituelle.*

As with many of these Bourbaki-jokes, this riddle too has several layers. There is the first straightforward mathematical interpretation of the [p-adic numbers](#)  $\hat{\mathbb{Z}}_p$  being used in the study of Diophantine problems.

For example, the local-global, or [Hasse principle](#), asserting that an integral quadratic form has a solution if and only if there are solutions over all  $p$ -adic numbers. [Helmut Hasse](#) was a German number theorist, held in high esteem by the Bourbaki group.

After graduating from the ENS in 1929, [Claude Chevalley](#) spent some time at the University of Marburg, studying under Helmut Hasse. Hasse had come to Marburg when [Kurt Hensel](#) (who invented the  $p$ -adic numbers in 1902) retired in 1930.

Hasse picked up a question from E. Artin's dissertation about the zeta function of an algebraic curve over a finite field and achieved the first breakthrough establishing the conjectured property for zeta functions of elliptic curves (genus one).



Extending this result to higher genus was the principal problem Andre Weil was working on at the time of the wedding-card-joke. In 1940 he would be able to settle the general case. What we now know as the Hasse-Weil theorem implies that the number  $N(p)$  of rational points of an elliptic curve over the finite field  $\mathbb{Z}/p\mathbb{Z}$ , where  $p$  is a prime, can differ from the mean value  $p + 1$  by at most twice the square root of  $p$ . So, Helmut Hasse is a passable candidate for the first-level, mathematical, decoding of 'le P. adique'.

However, there is often a deeper and more subtle reading of a Bourbaki-joke, intended to be understood only by the select inner circle of 'normaliens' (graduates of the [Ecole Normale Supérieure](#)). Usually, this second-level interpretation requires knowledge of events or locations within the [5-th arrondissement of Paris](#), the large neighborhood of the ENS.

For an outsider (both non-Parisian and non-normalien) decoding this hidden message is substantially harder and requires a good deal of luck.

As it happens, I'm going through a 'Weil-phase' and just started reading the three main Weil-biographies : [Andre Weil the Apprenticeship of a Mathematician](#), [Chez les Weil : André et Simone](#) by Sylvie Weil and [La vie de Simone Weil](#) by Simone Petrement.

From page 35 of 'Chez les Weil' : "Après la guerre, pas tout de suite mais en 1948, toute la famille avait fini par revenir Paris, rue Auguste-Comte, en face des jardins du Luxembourg." Sylvie talks about the Parisian apartment of her grandparents (father and mother of Andre and Simone) and I wanted to know its exact location.

More details are given on page 103 of 'La vie de Simone Weil'. The apartment consists of the 6th and 7th floor of a building on the Montagne Sainte-Geneviève. The Weils bought it before it was even built and when they moved in, in may 1929, it was still unfinished. Compensating this, the apartment offered a splendid view of the Sacre-Coeur, the Eiffel-tower, la Sorbonne, Invalides, l'Arc de Triomphe, Pantheon, the roofs of the Louvre, le tout Paris quoi...

As to its location : "Juste au-dessous de l'appartement se trouvent l'Ecole des mines et les serres du Luxembourg, avec la belle maison ancienne où mourut Leconte de Lisle." This and a bit of [googling](#) allows one to deduce that the Weils lived at 3, rue Auguste-Comte (the W on the map below).

Crossing the boulevard Saint-Michel, one enters the 5-th arrondissement via the ... rue de l'Abbe de l'Epee... We did deduce before that the priest might be an abbot ('from the order of the Diophantines') and l'Epee is just 'le P.' pronounced in French (cheating one egue). [Abbé Charles-Michel de l'épée](#) lived in the 18th century and has become known as the "Father of the Deaf" (compare this to Diophantus who is called "Father of Algebra"). épée turned his attention toward charitable services for the poor, and he had a chance encounter with two young deaf sisters who communicated using a sign language. épée decided to dedicate himself to the education and salvation of the deaf, and, in 1760, he founded a school which became in 1791 l'Institution Nationale des Sourds-

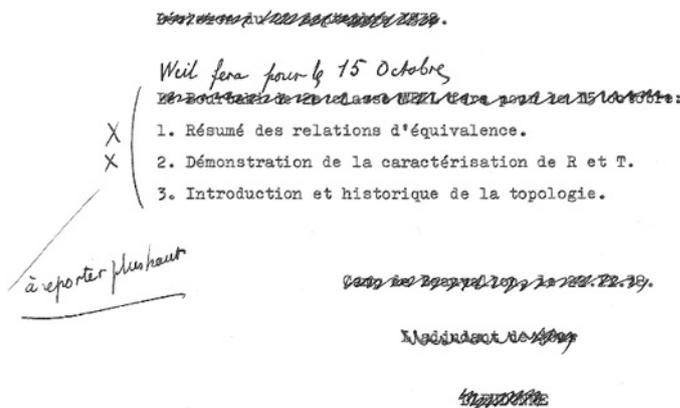




one famous photograph of the meeting. From left to right : Simone Weil (accompanying Andre), Charles Pison, Andre Weil (hidden), Jean Dieudonne (sitting), Claude Chabauty, Charles Ehresmann, and Jean Delsarte.

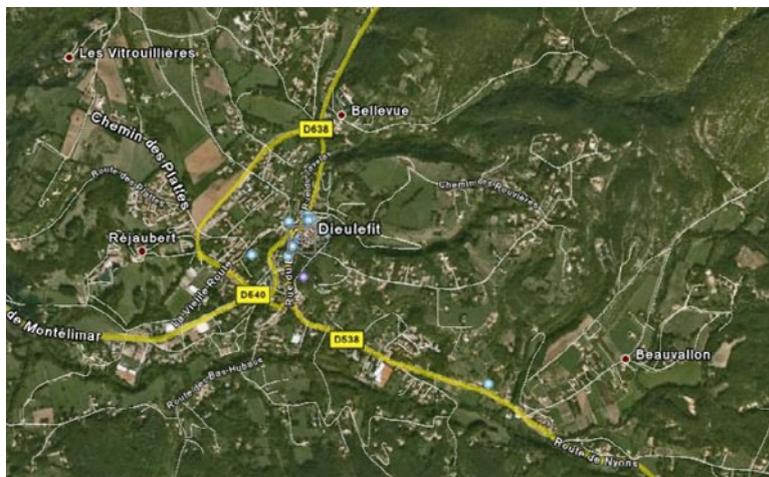
Failing further written documentation, 'all' we have to do in order to pinpoint the exact location of the meeting is to find a match between this photograph and some building in Dieulefit...

The crucial clue is provided by the couple of sentences, on the final page of the Bourbaki-archive document deldi-001 [Engagements de Dieulefit](#), someone (Jean Delsarte?) has tried to make illegible (probably early on).



Blowing the picture up, it isn't too hard to guess that the header should read 'Décision du 22 septembre 1938' and that the first sentence is 'Le Bourbaki de 2e classe WEIL fera pour le 15 octobre'. The document is signed : "Camp de Beauvallon, le 22.IX.38, L'adjutant de jour , DIEUDONNE"

Now we are getting somewhere. Beauvallon is the name of an hamlet of Dieulefit, situated approximately 2.5km to the east of the center.



Beauvallon is rather famous for its [School](#), founded in 1929 by [Marguerite Soubeyran](#) and [Catherine Krafft](#), which was the first 'modern' boarding school in France for both boys and girls having behavioral problems. From 1936 on the school's director was [Simone Monnier](#).

These three women were politically active and frequented several circles. Already in 1938 (at about the time of the Bourbaki congress) they knew the reality of the Nazi persecutions and planned to prepare their school to welcome, care for and protect refugees and Jewish children.

From 1936 on about 20 Spanish republican refugees found a home here and in the 'pension' next to the school. When the war started, about 1500 people were hidden from the German occupation in Dieulefit (having a total population of 3500) : Jewish children, intellectuals, artists, trade union leaders, etc. etc. many in the Ecole and the Pension.

Because of the towns solidarity with the refugees, none were betrayed to the Germans, [Le miracle de silence Dieulefit](#). It earned the three Ecole-women the title of "Juste" after the war. More on this period can be read [here](#).

But what does this have to do with Bourbaki? Well, we claim that the venue of the 1938 Bourbaki congress was the [Ecole de Beauvallon](#) and they probably used Le Pension for their lodgings.

We have photographic evidence comparing the Bourbaki picture with a picture taken in 1943 at the Ecole (the woman in the middle is Marguerite Soubeyran). Compare the distance between door and window, the division of the windows and the ivy on the wall.



Below two photographs of the entire school building : on the left, the school with 'Le Pension' next to it around 1938 (the ivy clad wall with the Bourbaki-door is to the right)

and on the right, the present [Ecole de Beauvallon](#) (this site also contains a lot of historical material). The ivy has gone, but the main features of the building are still intact, only the shape of the small roof above the Bourbaki-door has changed.



During their stay, it is likely the Bourbakis became aware of the plans the school had would war break out. Probably, Jean Delsarte removed all explicit mention to the Ecole de Beauvallon from the archives upon their return. Bourbaki's own small contribution to Dieulefit's miracle of silence.

## 1.10 What happened on the Bourbaki wedding day?

Early on in this series we deciphered part of the Bourbaki wedding invitation

*L'isomorphisme trivial leur sera donné par le P. Adique, de l'Ordre des Diophantiens, en la Cohomologie principale de la Variété Universelle, le 3 Cartembre, an VI, à l'heure habituelle.*

The wedding was planned on "le 3 Cartembre, an VI" or, for non-Bourbakistas, June 3rd 1939. But, why did they choose that particular day?

Because the wedding-invitation-joke was concocted sometime between mid april and mid may 1939, the most probable explanation clearly is that they took a calendar and scheduled their fake wedding on a saturday not too far in the future.

Or, could it be that the invitation indeed contained a coded message pointing to an important event (at least as far as Bourbaki or the Weils were concerned) taking place in Paris on June 3rd 1939?

Unlikely? Well, what about this story: [André Malraux](#) was a French writer and later statesman. He was noted especially for his novel [La Condition Humaine](#) (1933).



During the 1930s, Malraux was active in the anti-fascist Popular Front in France. At the beginning of the Spanish Civil War he joined the Republican forces in Spain, serving in and helping to organize the small Spanish Republican Air Force. The

Republic government circulated photos of Malraux's standing next to some Potez 540 bombers suggesting that France was on their side, at a time when France and the United Kingdom had declared official neutrality.

In 1938 he published [L'Espoir](#), a novel influenced by his Spanish war experiences. In the same year, Malraux and Boris Peskine produced a movie based on the book, filmed in Spain (in Tarragon, Collbat and Montserrat) : [sierra de Teruel](#) (later called, L'Espoir)

This wikipedia-page claims that the movie was released June 13th, 1945. But this isn't quite correct.

The first (private) viewing of the film [took place](#) ... on saturday *june 3rd, 1939*.

In august 1939 there was another private viewing for the Spanish Government-in-Exile, and Malraux wanted the public release to take place in september. However, after the invasion by Hitler of Poland and considerable pressure of the French ambassador to Madrid, Philippe Petain, the distribution of the movie was forbidden by the [government of Edouard Daladier IV](#). For this reason the public release had to be postponed until after the war.



But let us return to the first viewing on Bourbaki's wedding day. We know that a lot of authors were present. There's evidence that [Simone de Beauvoir](#) attended and quite likely so did [Simone Weil](#), Andre's sister.

In 1936, despite her professed pacifism, Simone Weil fought in the Spanish Civil War on the Republican side. She identified herself as an anarchist and joined the Sébastien Faure Century, the French-speaking section of the anarchist militia.

According to her [biography](#) (p. 473) she was still in contact with Malraux and, at the time, tried in vain to convince him of the fact that the Stalin-regime was as oppressive as the fascist-regimes. So, it is quite likely she was invited to the viewing, or at least knew about it.

From Andre Weil's [auto-biography](#) we know that letters (and even telegrams) were exchanged between him and his sister, when he was in England in the spring of 1939. So, it is quite likely that she told him about the Malraux-Sierra de Tenuel happening (see also [the Escorial post](#)).

According to the invitation the Bourbaki-wedding took place "en la Cohomologie Principale". The private viewing of Malraux' film [took place](#) in "Cinéma Le Paris" on the Champs Elysées.

Could it be that "Cohomologie Principale"="Cinema Le Paris"?

## 1.11 What's Pippa got to do with it?

In the previous section, we've seen that on June 3rd 1939, the very day of the Bourbaki wedding, Malraux' movie 'L'espoir' had its first (private) viewing, and we mused whether [Weil's wedding card](#) was a coded invitation to that event.

But, there's another plausible reason why the Bourbaki wedding might have been scheduled on June 3rd : it was intended to be a copy-cat Royal Wedding...



The media-hype surrounding the wedding of Prince William to Pippa's sister led to a hausse in newspaper articles on iconic [royal weddings](#) of the [past](#).

One of these, the marriage of [Edward VIII, Duke of Windsor and Wallis Warfield Spencer Simpson](#), was held on *June 3rd 1937* : "This was the scandal of the century, as far as royal weddings go. Edward VIII had just abdicated six months before in order to marry an American twice-divorced commoner. The British Establishment at the time would not allow Edward VIII to stay on the throne and marry this woman (the British Monarch is also the head of the Church of England), so Edward chose love over duty and fled to France to await the finalization of his beloved's divorce. They were married in a private, civil ceremony, which the Royal Family boycotted."

But, what does this wedding have to do with Bourbaki?

For starters, remember that the wedding-card-canular was concocted in the spring of 1939 in Cambridge, England. So, if Weil and his Anglo-American associates needed a common wedding-

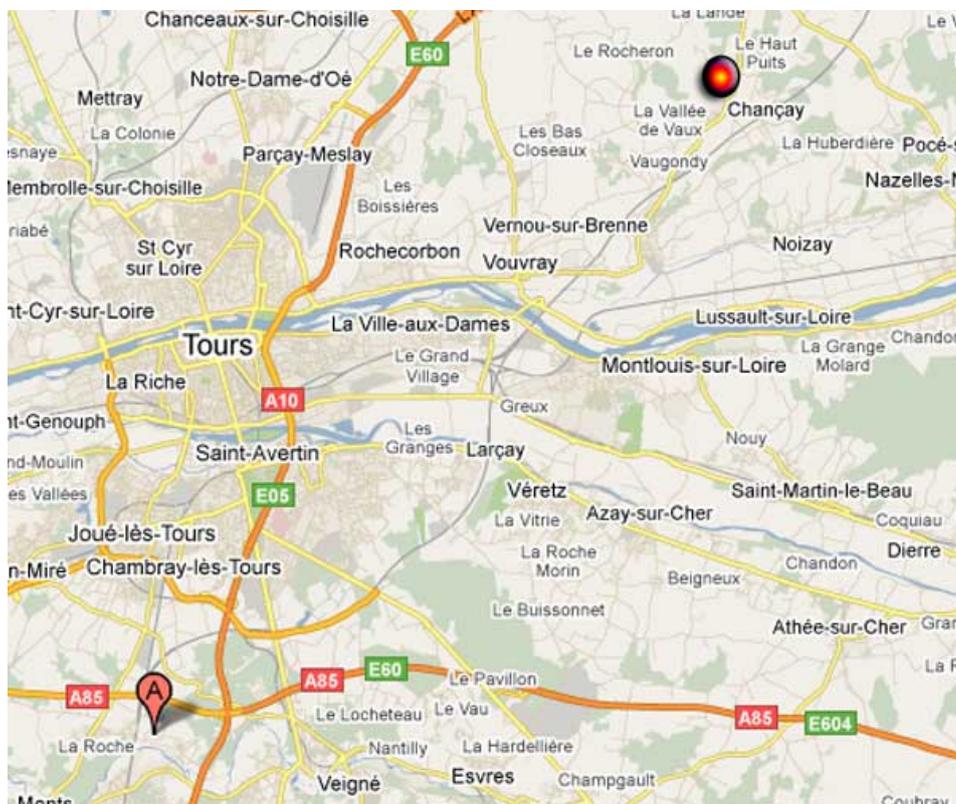
example, the Edward-Wallis wedding surely would spring to mind. One might even wonder about the transposed symmetry : a Royal (Betti, whose father is from the Royal Poldavian Academy), marrying an American (Stanislas Pondiczery).

Even Andre Weil must have watched this wedding with interest (perhaps even sympathy). He too had to wait a considerable amount of time for Eveline's divorce (see [this post](#)) to finalize, so that they could marry on october 30th 1937, just a few months after Edward & Wallis.





But, there's more. The royal wedding took place at the [Chateau de Candé](#), just south of Tours (the A on the google-map below). Now, remember that the 2nd Bourbaki congress was held at the Chevalley family-property in Chancay (see [the Escorial post](#)) a bit to the north-east of Tours (the marker on the map). As this conference took place only a month after the Royal Wedding (from 10th till 20th of July 1937), the event surely must have been the talk of the town.



Early on [1.2](#), we concluded that the Bourbaki-Petard wedding took place at 12 o'clock ('a

l'heure habituelle'). So did the Edward-Wallis wedding. More precisely, the civil ceremony began at 11.47 and the local mayor had to come to the castle for the occasion, and, afterwards the couple went into the music-room, which was converted into an Anglican chapel for the day, at precisely 12 o'clock.

The emphasis on the musical organ in the Bourbaki wedding-invitation allowed us (see 1.6) to identify the identity of 'Monsieur Modulo' to be Olivier Messiaen as well as that of the wedding church. Now, the Chateau de Candé also houses an impressive organ, [the Skinner opus 718 organ](#).

For the wedding ceremony, Edward and Wallis hired the services of one of the most renowned French organists at the time : [Marcel Dupré](#) who was since 1906 Widor's assistant, and, from 1934 resident organist in the [Saint-Sulpice church in Paris](#). Perhaps more telling for our story is that Dupré was, together with Paul Dukas, an influential teacher of Olivier Messiaen.

On June 3rd, 1937 Dupré performed the following pieces. During the civil ceremony, an extract from the 29e Bach cantate, canon in re-minor by Schumann and the prelude of the fugue in do-minor of himself. When the couple entered the music room he played the march of the Judas Macchabée oratorium of Händel and the cortège by himself. During the religious ceremony he performed his own choral, adagium in mi-minor by César Franck, the traditional 'Oh Perfect Love', the Jesus-choral by Bach and the toccata of the 5th symphony of Widor. Compare this level of detail to the minimal musical hint given in the Bourbaki wedding-invitation

"Assistent Simplexe de la Grassmannienne (lemmas chantés par la Scholia Cartanorum)"

This is one of the easier riddles to solve. The 'simplicial assistant of the Grassmannian' is of course [Hermann Schubert](#) (Schubert cell-decomposition of Grassmannians). But, the composer [Franz Schubert](#) only left us [one organ-composition](#) : the [Fugue in E-minor](#).

I have tried hard to get hold of the official invitation for the Edward-Wallis wedding, but failed. And, there must be quite a few of them still out there, of the 300 invited people only 16 showed up...

As Claude Chevalley's father had an impressive diplomatic career behind him and lived in the neighborhood, he might have been invited, and, perhaps the (unused) invitation was lying around at the time of the second Bourbaki-congress in Chancay, just one month after the Edward-Wallis wedding...



Fig. 1.5: Marcel Dupré

series 2

## BOURBACHIQUE

### 2.1 Bourbakism & the queen bee syndrome

Probably the smartest move I've made after entering math-school was to fall in love with a feminist.

Yeah well, perhaps I'll expand a bit on this sentence another time. For now, suffice it to say that I did pick up a few words in the process, among them : [the queen bee syndrome](#) :

"women who have attained senior positions do not use their power to assist struggling young women or to change the system, thereby tacitly validating it."

A recent [study](#) by the Max Planck Institute for Human Development asserts that the QBS

"likely stems from women at the top who feel threatened by other women and therefore, prefer to surround themselves with men. As a result, these Queen Bees often jeopardize the promotions of other females at their companies."

Radical feminists of the late 70-ties preferred a different 'explanation', clearly.

Women who fought their way to the top, they said, were convinced that overcoming all obstacles along the way made them into the strong persons they became. A variant on the 'what doesn't kill you, makes you stronger'-mantra, quoi. These queen bees genuinely believed it to be beneficial to the next generation of young women not to offer them any shortcuts on their journey through the glass ceiling.



But, let's return to mathematics.

By and large, the 45+generation decides about the topics that should be (or shouldn't be) on the current math-curriculum. They also write most of the text-books and course-notes used, and inevitably, the choices they make have an impact on the new generation of math-students.

Perhaps too little thought is given to the fact that the choices we (yes, I belong to that age group) make, the topics we deem important for new students to master, are heavily influenced by our own experiences.

In the late 60ties, early 70ties, Bourbaki-style mathematics influenced the 'modern mathematics' revolution in schools, certainly in Belgium through the influence of George Papy.

In kindergarten, kids learned the basics of set theory. Utensils to draw [Venn diagrams](#) were as indispensable as are pocket-calculators today. In secondary school, we had a formal axiomatic approach to geometry, we learned abstract topological spaces and other advanced topics.

Our 45+ generation greatly benefitted from all of this when we started doing research. We felt comfortable with the (in retrospect, over)abstraction of the [EGAs](#) and [SGAs](#) and had little difficulties in using them or generalizing them to noncommutative levels...

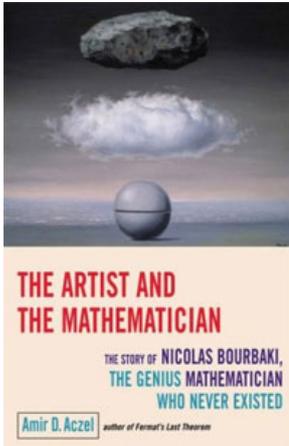
[Bourbakism](#) made us into stronger mathematicians. Hence, we are convinced that new students should master it if they ever want to do 'proper' research.

Perhaps we pay too little attention to the fact that these new students are a lot worse prepared than we were in the old days. Every revolution inevitably provokes a counter-revolution. Secondary school mathematics sank over the last two decades to a debilitating level under the pretense of 'usability'. Tim Gowers has an interesting [Ivory tower post](#) on this.

We may deplore this evolution, we may try to reverse it. But, until we succeed, it may not be fair to freshmen to continue stubbornly as if nothing changed since our good old days.

Perhaps, Bourbakism has become our very own queen bee syndrome...

## 2.2 The artist and the mathematician



Over the week-end I read [The artist and the mathematician](#) (subtitle : The story of Nicolas Bourbaki, the genius mathematician who never existed) by [Amir D. Aczel](#).

Whereas the central character of the book should be [Bourbaki](#), it focusses more on two of Bourbaki's most colorful members, [André Weil](#) and [Alexander Grothendieck](#), and the many stories and myths surrounding them.

The opening chapter ('The Disappearance') describes the Grothendieck's early years (based on the excellent paper by Allyn Jackson [Comme Appelé du Néant](#) ) and his disappearance in the Pyrenees in the final years of last century. The next chapter ('An Arrest in Finland') recounts the pre-WW2 years of Weil and the myth of his arrest in Finland and his near escape from execution (based on Weil's memoirs [The Apprenticeship of a Mathematician](#)). Chapter seven ('The Café') describes the first 10 proto-Bourbaki meetings following closely the study '[A Parisian Café and Ten Proto-Bourbaki Meetings \(1934-1935\)](#)' by Liliane Beaulieu. Etc.

etc.

All the good 'Bourbaki'-stories get a place in this book, not always historically correct. For example, on page 90 it is suggested that all of the following jokes were pulled at the [Besse-conference, July 1935](#) : the baptizing of Nicolas, the writing of the Comptes-Rendus paper, the invention of the Bourbaki-daughter Betti and the printing of the wedding invitation card. In reality, all of these date from much later, the first two from the autumn of 1935, the final two no sooner than april 1939...

One thing I like about this book is the connection it makes with other disciplines, showing the influence of Bourbaki's insistence on 'structuralism' in fields as different as philosophy, linguistics, anthropology and literary criticism. One example being Weil's group-theoretic

solution to the marriage-rules problem in tribes of Australian aborigines studied by [Claude Lévi-Strauss](#), another the literary group [Oulipo](#) copying Bourbaki's work-method.

Another interesting part is Aczel's analysis of Bourbaki's end. In the late 50ties, Grothendieck tried to convince his fellow Bourbakis to redo their work on the foundations of mathematics, changing these from set theory to category theory. He failed as others felt that the foundations had already been laid and there was no going back. Grothendieck left, and Bourbaki would gradually decline following its refusal to accept new methods. In Grothendieck's own words (in "Promenade" 63, n. 78, as translated by Aczel) :

"Additionally, since the 1950s, the idea of structure has become passé, superseded by the influx of new 'categorical' methods in certain of the most dynamical areas of mathematics, such as topology or algebraic geometry. (Thus, the notion of 'topos' refuses to enter into the 'Bourbaki sack' of structures, decidedly already too full!) In making this decision, in full cognizance, not to engage in this revision, Bourbaki has itself renounced its initial ambition, which has been to furnish both the foundations and the basic language for all of modern mathematics."

Finally, it is interesting to watch Aczel's own transformation throughout the book, from slavishly copying the existing Weil-myths and pranks at the beginning of the book, to the following harsh criticism on Weil, towards the end (p. 209) :

"From other information in his autobiography, one gets the distinct impression that Weil was infatuated with the childish pranks of 'inventing' a person who never existed, creating for him false papers and a false identity, complete with a daughter, Betti, who even gets married, parents and relatives, and membership in a nonexistent Academy of Sciences of the nonexistent nation of Polvedia (sic). Weil was so taken with these activities that he even listed, as his only honor by the time of his death 'Member, Poldevian Academy of Sciences'. It seems that Weil could simply not go beyond these games: he could not grasp the deep significance and power of the organization he helped found. He was too close, and thus unable to see the great achievements Bourbaki was producing and to acknowledge and promote these achievements. Bourbaki changed the way we do mathematics, but Weil really saw only the pranks and the creation of a nonexistent person."

Judging from my own reluctance to continue with the series on the [Bourbaki code](#), an overdose reading about Weil's life appears to have this effect on people...

## 2.3 Bourbaki and WikiLeaks



In an interview with readers of the [Guardian, December 3rd 2010](#), [Julian Assange](#) made a somewhat surprising comparison between [WikiLeaks](#) and Bourbaki, sorry, The Bourbaki (sic) :

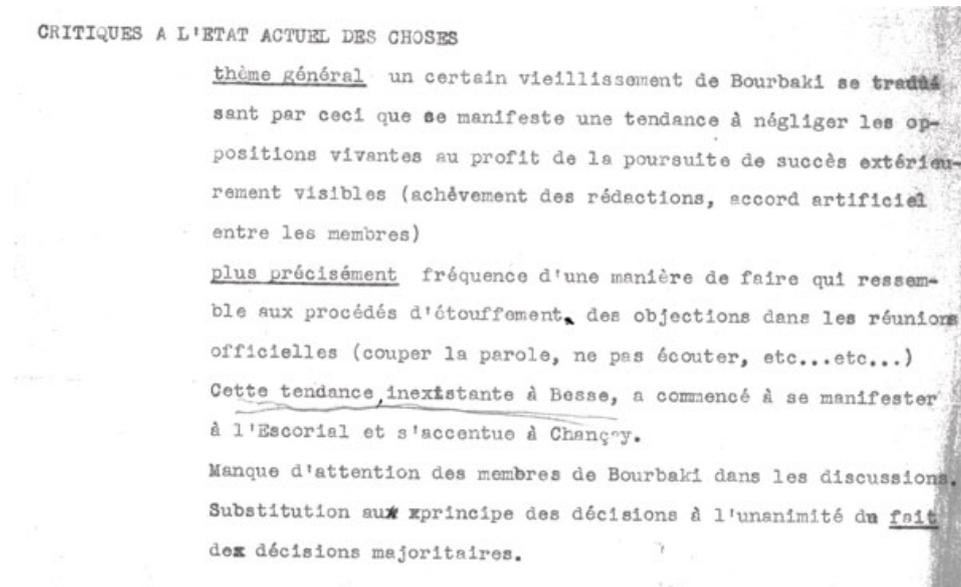
"I originally tried hard for the organization to have no face, because I wanted egos to play no part in our activities. \*\*This followed the tradition of the French anonymous pure mathematicians, who wrote under the collective allonym, "The Bourbaki".\*\* However this quickly led to tremendous distracting curiosity about who and random individuals claiming to represent us. In the end, someone must be responsible to the public and only a leadership that is willing to be publicly courageous can genuinely suggest that sources take risks for the greater good. In that process, I have become the lightning rod. I get undue attacks on every aspect of my life, but then I also get undue credit as some kind of balancing force."

Analogies are never perfect, but perhaps Assange should have taken it a bit further and studied the history of the pre-war Bourbakistas in order to avoid problems that led to the eventual split-up.

Clearly, if Bourbaki=WikiLeaks, then Assange plays the role of [Andre Weil](#). Both of them charismatic leaders, convincing the group around them that for the job at hand to succeed, it is best to work as a collective so that individual contributions cannot be traced.

At first this works well. Both groups make progress and gain importance, also to the outside world. But then, internal problems surface, questioning the commitment of 'the leader' to the original project.

In the case of the Bourbakis, [Claude Chevalley](#) and [Rene de Possel](#) dropped that bombshell at the second Chancay-meeting in 1937 with a 2 page pamphlet [7 theses de Chancay](#).



"Criticism on the state of affairs :

- in general, a certain aging of Bourbaki, which manifests itself in a tendency to neglect internal lively opposition in favor of pursuing visible external success ((failed) completion of versions, artificial agreement among members of the group).
- in particular, often the working method appears to be that of suffocating any objections in official meetings (via interruptions, not listening, etc. etc.). This tendency didn't exist at the [Besse meeting](#), began to manifest itself at the [Escorial-meeting](#) and got even worse here at Chancay. Bourbaki-members don't pay attention to discussions and the principle of unanimous decision-making is replaced in reality by majority rule."

Sounds familiar? Perhaps stretching the analogy a bit one might say that Claude Chevalley's and Rene de Possel's role within Bourbaki is similar to that of respectively [Birgitta Jnsdttir](#) and [Daniel Domscheit-Berg](#) within WikiLeaks.



This criticism will be neglected and at the following Bourbaki-meeting in [Dieulefit](#) (neither Chevalley nor de Possel were present) hardly any work gets done, largely due to the fact

that Andre Weil is more concerned about his personal safety and escapes during the meeting for a couple of days to Switzerland, fearing an imminent invasion.

After the Dieulefit-meeting, even though Bourbaki's fame is spreading, work on the manuscripts is halted because all members are reserve-officers in the French army and have to prepare for war.

Except for Andre Weil, who's touring the world with a clear "Bourbaki, c'est moi!" message, handing out Bourbaki name-cards or invitations to Betti Bourbaki's wedding... That Andre and Eveline Weil are traveling as Mr. and Mrs. Bourbaki is perhaps best illustrated by the thank-you note, left on their journey through Finland.

Soll ich ein langes Gedicht ersinnen? Sätze beweisen?  
 Zu schön, was ich erlebt Ein Wort nur heißt mir Merci  
 N Bourbaki 20/VIII/39  
 (Traduit du poldève par A Weil)  
 Une des femmes de Bourbaki  
 Eveline Weil

If it were not for the fact that the other members had more pressing matters to deal with, Weil's attitude would have resulted in more people dropping out of the group, or continuing the work under another name, a bit like what happens to WikiLeaks and [OpenLeaks](#) today.

## 2.4 Brigitte Bardot, miniskirts and homological algebra



The papers by [Liliane Beaulieu](#) on the history of the Bourbaki-group are genuine treasure troves of good stories. Though I'm mostly interested in the pre-war period, some tidbits

are just too good not to use somewhere, sometime, such as here on a lazy friday afternoon ...

In her paper [Bourbaki's art of memory](#) she briefly mentions these two pearls of wisdom from the jolly couple [Henri Cartan](#) (left) and [Sammy Eilenberg](#) (right) in relation to their seminal book [Homological Algebra](#) (1956).

#### *Brigitte Bardot and the Hom-Tensor relation*

For the youngsters among you, [Brigitte Bardot](#), or merely B.B., was an iconic French actress and sex-goddess par excellence in the 60ties and 70ties. She started her acting career in 1952 and became world famous for her role in [Et Dieu créa la femme](#) from 1956, the very same year Cartan-Eilenberg was first published.

The [tensor-hom adjunction](#) in [homological algebra](#) (see II.5.2 of Cartan-Eilenberg for the original version) asserts that  $\text{Hom}_R(A, \text{Hom}_S(B, C)) = \text{Hom}_S(A \otimes_R B, C)$  when  $R$  and  $S$  are rings,  $A$  a right  $R$ -module,  $C$  a left  $S$ -module and  $B$  an  $R$ - $S$ -bimodule.

Surely no two topics can be farther apart than these two? Well not quite, Beaulieu writes :

"After reading a suggestive movie magazine, Cartan tried to show the formula

$$\text{Hom}(B, \text{Hom}(B, B)) = \text{Hom}(B \otimes B, B)$$

in which "B. B." are the initials of famous French actress and 1950s sex symbol Brigitte Bardot and "Hom" (pronounced 'om as in homme, the French word for man) designates, in mathematics, the homomorphisms - a special kind of mapping - of one set into another."

#### *Miniskirts and spectral sequences*



Fig. 2.1: B.B.



I'd love to say that the [miniskirt](#) had a similar effect on our guys and led to the discovery of [spectral sequences](#), but then such skirts made their appearance on the streets only in

the 60ties, well after the release of Cartan-Eilenberg. Besides, spectral sequences were introduced by [Jean Leray](#), as far back as 1945.

Still, there's this quote : "The spectral sequence is like the mini-skirt; it shows what is interesting while hiding the essential."