

Francia – Forschungen zur westeuropäischen Geschichte

Bd. 31/2

2004

DOI: 10.11588/fr.2004.2.45700

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PETER BROSCHE

ZACH IN MARSEILLE –
AN ASTRONOMER'S TEMPORARY PARADISE¹

1. Some background²

Franz Xaver von Zach was born in 1754 in Pest (Hungary) as the son of an important physician in the Austrian army. He started a military career. Being involved in geodetic operations, he became a kind of assistant professor of mathematics and technology at Lemberg (Galicia). Around 1782, he started traveling in Western Europe, i. e. in upper Italy, France and England.

In London, he assisted the Saxony ambassador – himself a qualified amateur in astronomy and clock technology – in his observations. The same Count Brühl recommended Zach as founding astronomer to the duke of Saxe-Gotha-Altenburg, Ernst II., when the latter was going to create his own observatory. The almost twenty years in Gotha from 1786 onwards can be considered as the culmination of Zach's professional life: he erected the observatory and he founded the first astronomical journals. By means of the latter, he supported the search for the unknown planet between Mars and Jupiter. Beyond that, he himself redetected Ceres in collaboration with Gauss, after its first passage behind the Sun following its detection by Piazzi.

From 1802 onwards, it was Zach's intention to transform a call by the Prussian King to survey some newly acquired territories into the first Central European measurement of a great arc. He started with the most difficult longitude determinations using a kind of »time transport« with powder flashes from mountains.

The political circumstances had never been simple, but the difficulties started in 1804, when Zach's *maecenas*, the duke Ernst II., died suddenly. His successor had other interests and was a very special character. Zach fell back upon Eisenberg, the seat of the duke's widow Charlotte, becoming her master of the court. He continued with the surveying, but then the Napoleonic wars, and especially the battles of Jena and Auerstedt in 1806 brought that work to a complete halt. In 1807, he and the widow left Germany and went to Italy and France. A happy and distinguished period was the time in Marseille³ from the end of 1809 to October 1814. Later, they

1 Paper presented in October 2002 on the occasion of the tercentenary of the Observatoire de Marseille.

2 For the biography of Zach in general see Peter BROSCHE, *Der Astronom der Herzogin*. Frankfurt 2001 (*Acta Historica Astronomiae*, 12).

3 A short account of this time has been given already in: Peter BROSCHE, Suzanne DÉBARBAT, *Franz Xaver von Zach et l'astronomie dans la France méridionale*. 121^e Congrès national des sociétés historiques et scientifiques, Nice 1996, *Sur les traces de Cassini*, p. 279–286.

went to Genoa where Zach started a new journal. From 1826 onwards, he had to face three severe misfortunes: he began to suffer from stones in the bladder, he received an order of expulsion from the royal government in Turin – and ›his‹ duchess died, without doubt partially due to the distress that had been caused. Zach went to Paris, where his physician Civiale was the only one to successfully perform the non-invasive removal of bladder stones at this time⁴. Still in contact with science and scientists, he died there in 1832.

One could imagine that Zach's stays in Southern France would have been rather epochs of recreation than of creative work. This is not true however, as we shall see.

2. The earlier time

We want now to focus our attention on the relations of Zach with France, and especially with Southern France. As we have already mentioned, he went on a kind of ›grand tour‹ at the age of about 28 (although it was more a search for a position than a pleasure trip). We now have evidence that he travelled from France to Italy and back via the Mt. Cenis pass. Then he spent time at least in Lyon and in Marseille⁵. In Lyon, he worked with Father LeFèvre, and in Marseille he had contacts with Saint Jacques de Silvabelle⁶ and Bernard. In both places, he must have impressed the local authorities to such an extent that he became a member of the respective academy. It was about at the same time that he became affiliated to the academies of Dijon and Nîmes⁷. In comparison, it was not until 1805 that Zach became a member of the Institut de France. In a letter⁸ of 1810, Zach called Flaugergues in Viviers his eldest friend in France, whom he would know for 27 years. Hence also this acquaintance dates back to 1783. So, from the beginning, his liaison with France had a Southern touch. This was reinforced, when Zach accompanied the duke and the duchess in autumn of 1786 on a trip to Southern France which lasted until the spring of 1787.

A week was spent around the new year in Marseille. It must have been at the very end of 1786 when Zach delivered a lecture on timekeepers to the local academy⁹. In

4 Zach's letters to his friend Schiferli constitute a singular document for the history of medicine as well: Leo GOSTELI, Urs BOSCHUNG, Peter BROSCHE (Eds.): *Astronom, Weltbürger, Blasensteinpatient. F. X. von Zachs Briefe an R. A. v. Schiferli 1821–1832*. Basel 1998 (Gesnerus = Swiss Journal of the History of Medicine and Sciences, Suppl. 45).

5 BROSCHE (see note 2) p. 27.

6 Guillaume Saint Jacques de Silvabelle (1722–1801) was the director, whom he honored later with a biography and a portrait: Franz Xaver von ZACH, *St. Jacques de Silvabelle*. *Monatl. Corr.* 18 (1808) 58–73. We abbreviate henceforth in this manner the following journal: *Monatliche Correspondenz zur Beförderung der Erd- und Himmelskunde*, Becker at Gotha, ed. by F. von ZACH (2 volumes per year, in total vol. 1 to 28, 1800 until 1813).

7 Dr. J. Caplan found out in the archive of the academy of Marseille that Zach was elected at 1783 August 10 but ›installed‹ – together with the duke – as member in 1787 January 3. BROSCHE (see note 2) p. 277.

8 Z to F No. 228, 1810 January 17. The abbreviation Z to F means a letter from Zach to Flaugergues with the given number and date. Archive: Observatoire de Paris, Bibliothèque, Manuscrits 1058 (IV). Honoré Flaugergues (1755–1835) was Justice of the Peace.

9 Franz Xaver von ZACH, *Mondfinsternisse und Planeten, Beobachtungen ... astronomische Nachrichten etc.* BAJ for 1794 (1791) p. 168–213, here p. 202. – BAJ is our abbreviation for ›Astronomisches Jahrbuch für das Jahr X (Y)‹, ed. by J. E. BODE, Berlin. Usually year of appear-

this lecture, he made an interesting proposal, which was to determine the oblateness of the Earth from time measurements alone. After this, they were based in Hyères, where a tower in the town wall was converted into the first »Observatoire de la Côte d'Azur« (Fig. 1).

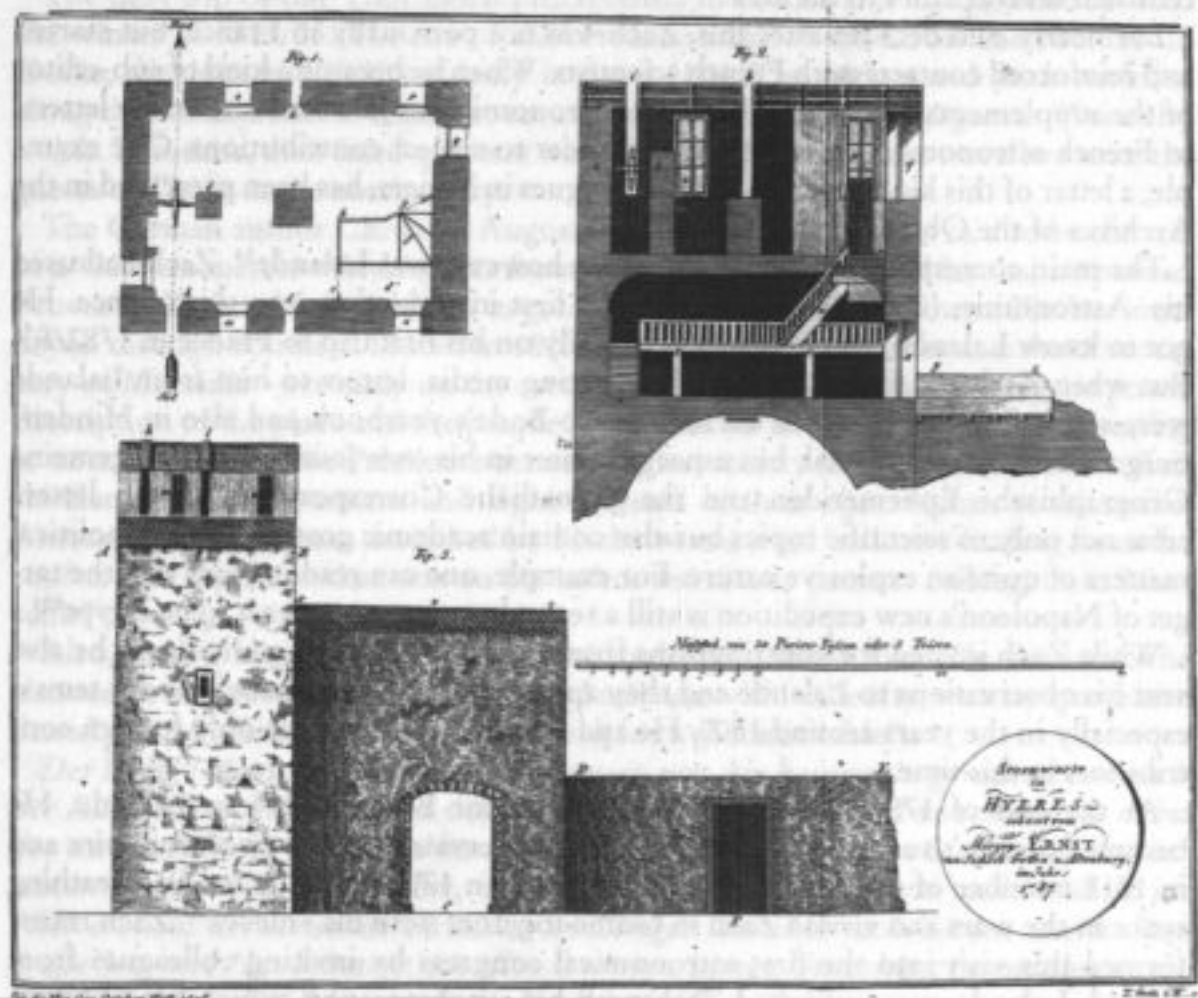


Fig. 1: The temporary observatory in Hyères¹⁰.

ance $Y = \text{year of validity } X - 3$ (»for« or »validity« refers to the ephemerides of celestial bodies, which had to be given ahead of time).

¹⁰ Engraving belonging to: Franz Xaver von ZACH, *Astronomische Beobachtungen und Bemerkungen auf einer Reise in das südliche Frankreich im Winter von 1804 auf 1805* (Forts. zum September-Heft), *Monatl. Corr.* 14 (1806) p. 293–308. – The tower exists still today, although augmented by an additional part: Peter BROSCHE, *Eine Zach-Tour*. *Mitt. Gauß-Gesellschaft* 20/21 (1983/84) p. 54–61.

Hyères was near enough to Marseille for Zach to continue his personal and scientific contacts. His friendship with Thulis was founded¹¹; Thulis visited Hyères and participated in an excursion to Genoa and Milan. Zach writes enthusiastically, excitedly and in a poetic manner on the beauty of Hyères and its surroundings. This and later expressions of approval by the duchess make it understandable that both returned several times to the area.

For nearly two decades after this, Zach was not personally in France, but started and reinforced contacts with French scientists. When he became a kind of sub-editor of the supplements to Bode's¹² *Berliner Astronomisches Jahrbuch*, he wrote letters, to French astronomers among others, in order to collect contributions. One example, a letter of this kind to his friend Flaugergues in Viviers, has been preserved in the Archives of the Observatoire de Paris¹³.

The main correspondent he had in France however was Lalande¹⁴. Zach had used his ›Astronomie‹ (2 vol. Paris 1764) for his first introduction into this science. He got to know Lalande (and Laplace) personally on his first trip to France in 1782/83. But when Zach obtained access to the printing media, letters to him from Lalande were a standing issue: first in the annexes to Bode's yearbook and also in Hindenburg's mathematical journal, but especially later in his own journals, the *Allgemeine Geographische Ephemeriden* and the *Monatliche Correspondenz*. These letters refer not only to scientific topics but also contain academic gossip and even political matters of quite an explosive nature. For example, one can read in print that the target of Napoleon's new expedition is still a secret but one supposes it to be Egypt¹⁵!

While Zach invited for contributions from France in German periodicals, he also sent his observations to Lalande and they appeared in the ›*Connaissance des tems*‹, especially in the years around 1800. He and Olbers are almost the only foreign contributors in this time.

At the end of 1797, Zach sent his collaborator Burckhardt¹⁶ to Lalande. He became Lalande's successor as director of the observatory of the *École militaire* and in 1818 member of the *Bureau des Longitudes*. In 1798, Lalande used a breathing space in the wars and visited Zach in Gotha together with his ›nièce‹¹⁷. Zach transformed this visit into the first astronomical congress by inviting colleagues from abroad. Lalande even entrusted Zach with his autobiography, which has unfortunately now disappeared¹⁸. When Lalande was attacked by some scholars because of

11 Jaques Joseph Claude Thulis (1748–1810). – BAJ for 1791 (1788) 123. Thulis is said to be a merchant who spent 7 years in Cairo. He ordered a cork model of the Hyères observatory from an artist who made models of the ancient buildings in Nîmes (Nîmes). The ducal couple were presented with this model, which has now unfortunately been lost.

12 Johann Elert Bode (1747–1826).

13 Z to F No. 218, 1793 March 22.

14 Joseph Jérôme le François (de)Lalande (1732–1807).

15 BROSCHE (see note 2) p. 85.

16 Johann Karl Burckhardt (1773–1825).

17 Quotation marks because she was called by Lalande this way, but doubts existed in public about the true relationship.

18 BROSCHE (see note 2) p. 84. – It may be identical with a text which was offered for sale in recent years in Paris, but could not be bought by the academy and was sold to an unknown private party.

his demonstrated vanity, Zach stroke back in public with this remarkable sentence: »Möchten doch manche Deutsche Gelehrte, die wir hier im Sinne haben, ihrer Deutschen Originalität unbeschadet, von den Ausländern – und selbst von den bösen und seichten Franzosen eine Sache lernen, woran es ihnen noch zu gebrechen scheint – Urbanität«¹⁹.

The next trip of our Thuringian protagonists to France and to Provence covered the winter of 1804/05. The fire of the revolution had swept across the country. In Gotha, the duke had died suddenly in April 1804. The widow and Zach travelled along the classical Rhine-Rhone route and surprised friend Flaugergues at Viviers by a visit. This time, their fixed quarters were in Marseille, where the travellers were the guests of Thulis at the observatory.

The German author Christian August Fischer (1771–1829) was said to be the son of a German merchant's daughter from Marseille²⁰. In his travel books, he praised Provence. Zach held these books in great esteem and cited from them. Fischer journeyed through Southern France in 1803/04 and also visited Thulis and the observatory of Marseille – certainly on the recommendation of Zach. He gave a nice poetic description of the place and the people he met in two of his books²¹. It is interesting to note that in 1781 the Palatinate meteorological society (Mannheim) had sent their standard set of instruments and eight volumes of their observations to Marseille. Amongst the equipment described by Fischer was a wind indicator leading from the roof to the top floor that was so far unknown to our present colleagues in Marseille²².

Also, Zach is inspired poetically by the landscape around Marseille. And since he also seems to agree with the multicultural mixture within the city, we may quote him literally²³ and multilingually (it is a remark for a geodetic table!):

Der letzte Hügel, von dem man, wenn man von Aix kommt, in gerader Linie nach der Küste hinunter steigt, und von wo aus man das ganze Thal von Marseille nebst der schönen Bucht übersehen kann. Dieser Anblick von diesem Standorte, welcher seinen Namen von daher führt, ist eben so einzig, als er reizend und berühmt ist. Hier erblickt der Reisende zwischen unzähligen Bastiden und Gärten zuerst diese große See- und Handelsstadt mit allen ihren maritimen Umgebungen und ihren exotischen Formen. Gelangt man in die Stadt, so heißt es alsdann:

Even its export to a foreign country was not forbidden by French authorities (communications by Prof. Jean-Claude PECKER, Collège de France).

19 BROSCHE (see note 2) p. 86.

20 Johanna (Auguste) Sophie Fischer née Hahn: Josef HUERKAMP, Georg MEYER-THUROW, Die Einsamkeit, die Natur und meine Feder, dies ist mein einziger Genuß«. Christian August Fischer (1771–1829) – Schriftsteller und Universitätsprofessor. Bielefeld 2001, p. 25. In 1804, Fischer is called a member of the »Gesellschaft der Wissenschaften« [academy?] in Marseille (p. 221).

21 Christian August FISCHER, Briefe eines Südländers. Leipzig 1805, p. 107–113. Id.: Reise nach Hyères im Winter 1803/4. Leipzig 1806, p. 122.

22 Communication of Dr. James CAPLAN (Observatoire de Marseille).

23 Franz Xaver von ZACH, Astronomische Beobachtungen und Bemerkungen auf einer Reise in das südliche Frankreich im Winter von 1804 auf 1805, Forts., Monatl. Corr. 14 (1806) pp. 197–210, here p. 205. – The place of this nice outlook was called »Viste au Cabaret«.

... *ici sont rencontrées*
Toutes les Nations de diverses contrées,
L'Anglois, le Musulman, le Russe, le Germain
Et le Sujet du Roi et le Républicain
Et celui qui naquit sous les loix du Despôte,
Tout n'est qu'un peuple ici, tout est compatriote.

Zach's work here and in the surrounding area was mostly of astro-geodetic nature. In December 1804 he reached the summit of the Monte Sainte Victoire and was very impressed. A return in February was planned, in order to start a project of powder signals for the determination of longitudes; this had to be cancelled because of the weather. Together with Pons, the concière and assistant in Marseille, Zach observes the surrounding coastline from the island of Planier – or at least he tries to, because in the first few days a great storm hindered any such work. From mid March to mid April 1805, Hyères is visited by the duchess and Zach. They find old friends and only little damage at the observatory tower. Therefore the instruments can be installed and work can start again.

On the return trip, the travellers stay for some time in Avignon. J. Guerin, a physician and professor of natural history shows them round²⁴. He is the secretary of the Athenée de Vaucluse (and one may suppose that Zach also became a member of this society). Zach was informed by him that the assets of the former Jesuit and director of Marseille observatory, Esprit Pezenas (1692–1776), were for sale. But the person responsible was away and hence Zach could not buy these assets. From Avignon the Fontaine de Vaucluse receives a sentimental visit from Zach, the duchess and Guerin. A planned ascent of Mt. Ventoux (again for sending powder signals) had to be cancelled because of a storm.

3. Years in Marseille

So far we have spoken of *visits* by Zach to southern France. This changed in 1807, when the duchess and he decided to leave the destruction in the battle-fields of Saxony for good. It seems that originally a route directly to France as on the other occasions was foreseen. The duchess wrote on April 12, 1807 to Flaugergues²⁵: *Je me fais une vraie fête de vous revoir [...] car la belle Provence est mon Paradis terrestre.* Actually, the travellers went first to Upper Italy and later for the first quarter of 1808 to Marseille, already with intentions of settling somewhere. But it was only after further journeys through Italy that this idea was realized. In December 1809 a country house (›campagne‹) was rented from a M^r Mendret at St. Peyre, later another one from a M^r Rolland at la Capelette. Today, both locations lie within the city. Zach praises these residences in his letters and publications, both in general terms and with regard to astronomical observations. In later years, when he lived in Genoa, he compared both places very frankly²⁶. The silver-tone of the sky in Italian paintings is

24 Franz Xaver von ZACH, title see note 23, *Monatl. Corr.* 15 (1807) p. 213–238. Mainly on Petrarca and old inscriptions.

25 Z to F No. 225, 1807 April 12.

26 Franz Xaver von ZACH, *Auszüge aus mehreren Briefen des Herrn Oberhofmeisters Freiherrn von Zach an den Director der Sternwarte Seeberg* [the director was B. von Lindenau]. *Zeitschrift für*

a proof of the greater humidity, the prevailing Mistral is the cause for the much clearer sky in Provence. To quote Zach: »I don't want to have an estate in Provence but I would like to live there!« (from the German original)

This is the word of an observer, and Zach was mainly an observational astronomer – although he undertook orbit determinations and understood how to compute perturbations. And it was he who induced Laplace to present his arguments for classical black holes in analytical detail. From the German version in Zach's journal²⁷, it has been translated into the English edition of Hawking and Ellis²⁸.

Astronomers know the perennial latent conflict between ›little‹ observers and ›arrogant‹ theoreticians who do not have to struggle with technical details. In France, this was enhanced by the likewise perennial conflict (should I say contrast?) between the capital and the country.

As early as 1789 Father David from Bohemia noted from his conversations with Zach in Karlsbad²⁹ that the Parisian academicians use their countrymen ill. E. g., Silvabelle told Zach – probably in 1787 – that he had sent a treatise to Paris which did not appear in any publication but was also not given back. Finally, an excerpt was printed under the name of the academy. The young and able Silvabelle was very disheartened, to the disadvantage of astronomy. The academicians in Paris would say: *Nous seuls ici avons de l'esprit*.

This was not a predominant issue for Zach and, in fact, he admired great theoreticians. But *if* a conflict of this type arose, then his place was certainly on the side of the observers. This was the case when Lalande died in 1807 and his successors as editors of the ›Connaissance des tems‹ were less inclined to provide space for observations in the ›additions‹ of his yearbook. In this situation, Zach offers his journal³⁰ in a very outspoken letter to his friend Flaugergues, written in his characteristic style (Fig. 2).

While in Paris the observers have difficulty in entering by the back door, by him they are heartily welcomed at the main portal! On the other hand, one should not mind Zach's P's and Q's. He complains at the ›gros chanoines‹ in Paris, but he himself was really a canon (a Prussian and protestant one), and if he speaks of himself in the third person in letters to his slim friend Oriani, then it sounds like *le gros baron!*

If it comes to questions of personnel and positions, Zach was accustomed to being asked for his suggestions all around in Europe. And he always preferred the practitioner over the university-bred candidate, or, amongst university men, judged com-

Astronomie und verwandte Wissenschaften 2 (1816) 299f. – This journal appeared in Stuttgart at J. G. Cotta, ed. by B. von LINDENAU und J. G. F. BOHNENBERGER (2 volumes per year, vol. 1 to 6, 1814 until 1816).

27 Peter Simon LA PLACE, Beweis des Satzes, daß die anziehende Kraft bey einem Weltkörper so groß sein könne, daß das Licht davon nicht ausströmen kann. Allgemeine Geographische Ephemeriden 4 (1799) p. 1. – This journal appeared in Weimar at Bertuch from 1798 (2 volumes per year, volumes 1–4 ed. by F. von ZACH).

28 Stephen W. HAWKING, George F. R. ELLIS, The Large Scale Structure of Space-Time. Cambridge 1973.

29 Otto SEYDL (Ed.): Briefe Franz Xaver Freiherrn von Zach ... und seines Nachfolgers Bernhard von Lindenau von 1791–1816 an P. Martin Alois David. Publ. Obs. Nat. Prague 11 (1938) p. 48f.

30 See also Jean-Michael FAIDIT, Le Baron von Zach et l'astronomie en Languedoc, in: Acta Historica Astronomiae 3 (1998) pp. 80–84.

Vous voyez donc, mon cher, l'allégorie, comme les grands génies de la capitale nous traitent, nous autres pauvres Châtres de la province! On nous refuse les petites Entrées dans la Connaissance de l'art, mais vous avez bien les grandes Entrées dans ma Correspondance astron. et géographique: ainsi envoyez moi toute de suite, vos Occultations, vos Eclipses des Satellites de J., et vos formules pour le Réticule de Bradley, je les invierai toutes avec mille et mille plaisir, et encore avec mille et mille remerciements.

Fig. 2: Excerpt from a letter of Zach to Flaugergues (Z to F No. 232a, 1813 Oct. 24, p. 2).

petence on the basis of practical work and not of the subject that the person had studied. During a longer stay in Genoa in 1807, Zach tried to found an observatory with some instruments and with two volunteers, one professor of mathematics and one of medicine. The description of the inability of the first in comparison with the second is an absolutely hilarious highlight in Zach's letters to Oriani! Another example is his esteem for the caretaker Pons³¹ of the Marseille observatory. Zach praised him on many occasions for his participation in observational work. A decade later, in 1819, Pons got a position as astronomer in Lucca, where Zach had fulfilled the wishes of the »queen of Etruria« (the duchess of Lucca) by establishing her own observatory.

In 1809, when Zach saw that his old friend Thulis was suffering after several strokes and would soon die, he immediately asked his other friend Flaugergues in Viviers to be a candidate for the succession as director of Marseille observatory. The reactions of Flaugergues have not survived, but Zach was sure that his opinion had the greatest weight in the selection committee of the local academy. Not surprisingly for historians, the candidate put in last place by Zach got the position.

It was also not surprising then that two outsiders assisted Zach in his geodetic operations around Marseille: M^r Martin, secretary of the academy, and M^r Raboul from the lycée (he had been the second candidate for the succession of Thulis³²). The target is a new geodetical network around Marseille. Two locations for observations play an especially important rôle: the island of Planier and the ruins of the monastery, Ermitage de Notre-Dame des Anges.

Both are honored with pictures in the outline report »Attraction des montagnes«³³ whose title expresses the severe problem attacked by Zach: the deviation of the plumb line caused by the attraction of the mountain ranges. He believed that he had definitely proved the existence of such an effect amounting to two seconds of arc between the island and Mt. Mimet. Besides his own data, Zach also presents a complete re-reduction of data from Maskelyne³⁴ (who had only partially reduced his data from around the Scottish mountain Shehallien).

31 Jean Louis Pons (1761–1831).

32 Z to F No. 230, 1810 February 27.

33 Le Baron de ZACH [= Franz Xaver von Zach], L'attraction des montagnes, et ses effets sur les fils a plomb ou sur les niveaux des instrumens d'astronomie, constatés et déterminés, par des observations astronomiques et géodésiques, faites, en 1810, a l'ermitage de Notre-Dame des Anges, sur le Mont de Mimet, et au fanal de l'isle de Planier près de Marseille; suivis de la description géométrique de la ville de Marseille et de son territoire. 2 volumes, Avignon 1814.

34 Nevil Maskelyne (1732–1811).

In his portrait from Genoa showing him at an age of nearly 70, one of the two books lying beside him is the ›Attraction‹, thus it is clearly one of his most important achievements in his own estimation (Fig. 3).

Especially on the present occasion, it should be stressed that these 2 volumes contain much more than just what the title says. One of those other constituents is a 90-page history of astronomy at Marseille, starting from Pytheas around 330 B.C.

In order to harvest all the professional informations Zach had presented on Marseille and on Southern France, his articles in journals and yearbooks should not be forgotten. Of course, first of all in his own journals. The German ones do have indexes, hence the effort involved is not large. His ›Correspondance astronomique‹ appeared without index but with detailed lists of content per issue. It would be of great value for the history of our science if these lists could be converted and stored electronically and if a first order index could be produced from the content.

Before the ›Attractions‹, Zach also used a printer in Marseille to bring out his ›Nouvelles tables d'aberration et de nutation‹ (Marseille 1812). Was Avignon a better place if higher quality was wanted?

The personal connections of Zach with southern France did not always stem from his professional activities. In 1811 he was invited to the area around Gap in the department of Hautes Alpes by the baron Arnaud de Vitrolles, whom Zach had met for the first time 1798 in Germany, when de Vitrolles was serving in the army of the prince de Condé³⁵. In the same area, Zach even found relatives of his who had been scattered all over Europe by the upheavals of the revolution and the accompanying wars. However, he is not very specific on this point and only a niece, a daughter of his brother Anton, who was married to a baron Faverges, is mentioned specifically. She spent several months living in Marseille with Zach and the Duchess³⁶.

4. Observer from a distance

The duchess and Zach left their terrestrial paradise in 1814 because of the new political situation. In his letters to his friend Flaugergues³⁷, Zach gives reasons for the coming departure. He fears that the revolutionary situation could prevent free travel, if nothing worse.

After an interlude in Naples, the duchess and Zach settled in Genoa. Also from there, Zach remains interested in the astronomy of Marseille. He arranges the position for Pons at Lucca³⁸ and he continues to praise Pons and his achievements in his new journal, the *Correspondance Astronomique* (CA), founded in 1818. E. g. when he speaks about the ›bon peuple du département des hautes-Alpes‹, he adds a note

35 Lettre X du Baron de ZACH, *Corr. Astr.* 3 (1819) 211ff. – Abbreviation for this journal: *Correspondance astronomique, géographique, hydrographique et statistique du Baron de Zach*, Gènes chez A. Ponthenier (2 volumes per year except 1 and 4, 15 = fragment, 1818 to 1826).

36 In the winter 1809/10: Z to F No. 227, 228, 230, 1809 October 27 to 1810 February 27.

37 Z to F No. 237, 1814 May 10.

38 BROSCHE (see note 2) p. 241ff. – Lettre I du Baron de ZACH, *Corr. Astr.* 3 (1819) p. 20. – [ZACH], *Nouvelles et Annonces II. Première Comète de l'an 1822*. *Corr. Astr.* 6 (1822) p. 381f. for personal remarks, beyond those many announcements of Pons' discoveries of comets.



Fig. 3: Zach in Genoa around 1820. Painting by Rosa Bacigalupo (ca. 1794–1854) (Schloßmuseum Gotha, reproduced by permission of Bildarchiv Foto Marburg, from Arch. Nr. B 27.574/11).

on Pons. In one of his habitual frank footnotes, he criticises the state of affairs in Marseille in 1822³⁹:

»Depuis le départ de M. *Pons* de Marseille, l'observatoire royal de cette ville est tout-à fait *dégringolé*. Il est dans un état à faire pitié. Le grand réflecteur de 6 pieds, monté parallèlement, qui a coûté mille louis d'or, est abîmé de fond-en-comble; le miroir est terni et défiguré. Un mauvais instrument des passages, aucun instrument pour prendre hauteur! Si des étrangers n'y avaient porté de bons instrumens, on ne saurait pas encore quelle est la vraie latitude de cet observatoire qui depuis un siècle et demi avait des *Chazelles*, des *Feuillées*, des *Sigalloux*, des *Laval*, des *Pezenas*, des S.^t *Jacques*, des *Bernard*, des *Thulis* pour directeurs. Toujours ce ne sont pas les instrumens, ni les astronomes de cet observatoire royal, par lesquels on a eu la véritable latitude de la patrie de *Pythéas* et d'*Euthymènes*! Nous apprenons qu'enfin (vaut mieux tard que jamais) on a placé à ce malheureux observatoire négligé, naguères si célèbre, un jeune astronome rempli de connaissances, d'intelligence, de zèle et d'aptitude, mais que fera-t-il avec des outils rouillés, pour lesquels, il faut deux hommes et un cabestan pour les mettre en mouvement!!«⁴⁰

When Zach believed to be cured from his bladder stones at the end of 1827, he went to Marseille for recuperation⁴¹. During a new manifestation of his illness, he obtained help from Dr. Roux, general secretary of the Académie royal de Médecine, of which Zach himself was a member. While Zach acknowledges fully the efforts of Dr. Roux, he is very negative about Marseille in general. He cannot recognize the old merits and he does not want to cause grievous memories by visiting the places of his earlier happiness.

In earlier years, Zach exchanged many letters with Valz⁴² (then in Nîmes), of whom he had a good opinion. When Valz was the head of the observatory at Marseille later on, he approved the proposal by his voluntary collaborator Tempel, to implicitly honor Zach by christening the minor planet No 64 as Angelina, in commemoration of Zach's observation site, the former Ermitage Notre Dame des Anges.

In this way the expert in the measurement of celestial angles, who had served Provençal astronomy both as a guardian angel and, as it were, as the cherubim with the flaming sword of judgement, had finally attained a place in the firmament.

5. Conclusions

Zach's epochs of residence in France were by far more than times of recreation or retirement. Instead, they were essential both for his professional development and for the one of his colleagues and of their institutions. This especially refers to the years at Marseille (1809–1814). His restless and arduous geodetic activity around Marseille led as well to new local trigonometric data as to a basis for his evaluation of the deflection of the plumb line by mountains. Despite of his non-official status, he was influential in questions of filling positions. When the observers in Southern France had difficulties to publish their results, he offered his journals. Finally, Zach became the first historiographer of the Marsilian astronomy.

39 Corr. Astr. 6 (1822) p. 381f. (see note 38).

40 The young astronomer is Gambart, the foreigner of course Zach himself.

41 Dezember 1827 to May 1828: GOSTELI et al. (note 4) p. 264–288.

42 FAIDIT (see note 30) p. 83.