A CONFLICT AT THE GRAMMAR SCHOOL OF LEYDEN

H.J. SMID, T.U. Delft

Introduction

In the first half of the 19th century - in the years 1821-1823 to be more precisely - a conflict arose between the mathematics teacher and the rector of the grammar school of Leyden.

Leyden is a town in the Netherlands with, at that time, about 30,000 inhabitants. In Leyden the oldest university of the Netherlands is situated, a detail of some importance for our story.

Conflicts in schools are not unusual; twenty years later for instance another conflict between a new math teacher and a new rector of the same school arose. But there is something special about the conflict mentioned first. The math teacher involved - his name was Jacob de Gelder - can be described as the key figure in the development of math teaching in the first half of the 19th century in the Netherlands. The rector, Frans Anthoni Bosse, was described after his death as a perfect example of what a rector of a grammar school should be. The circumstances of the conflict are highly illuminating for the difficult position in that period of math teaching in the Netherlands. In this paper I shall use this conflict to illustrate this position.

The historical situation

To understand fully the events I will describe it is useful to know something about the circumstances under which they took place.

The Netherlands had from the end of the 16th century until 1795 formed a republic. This republic, which in the 17th century had played a major role in Europe, both politically and cultural, had been an interesting mixture of old and new. Some of its aspects, such as the tolerant intellectual climate, can be considered as well ahead of the time. But the internal organization of the state was rather old fashioned. While other European countries were heading toward a centralized, powerful government, in the Netherlands the central government remained weak.

Education was run by the cities and villages themselves. Only the province of Holland issued a regulation for the grammar schools of that province, but that regulation, dating from 1625, was never accommodated to the changing circumstances. And for the grammar schools the circumstances did change, and not for the best. For instance, the grammar school of Leyden had in the 17th century more than 100 pupils - the most famous was no doubt Rembrandt van Rhijn, the painter -, but at the end of the 18th century there were only about 25 left. There were some larger grammar schools at that time, but most of the about 60 grammar schools were smaller, some of them having only 5, or even less pupils. But the local governments stubbornly kept alive their grammar schools; they considered having a grammar school as a matter of prestige.

There were some reasons for the decline of the number of students of the grammar schools. Due to the improvement in the primary school system, parents did not send anymore their children to the lower classes of the grammar school just to learn read and write, as was not unusual before. In the field of the secondary education private schools, the so called French schools, offering a more modern program, including modern languages, attracted many more pupils than the old fashioned grammar schools. There is no reason to suppose that the Dutch population was less well educated than the century before. But the grammar schools remained

the schools for the elite, the upper class. The decline of the grammar schools was seen by that class as a symbol for the decline of the state.

In 1795, with the assistance of French troops under general Pichegru, the old Republic was overthrown. A new republic was established, with a stronger central government, and more modern, Enlightenment based ideas about education. But, unlike in most European countries, the government focused on primary education. Several laws on primary education were passed, but in the field of secondary education, nothing was achieved. From 1806 - 1810 the Netherlands formed the Kingdom Holland under one of Napoleons brothers, and from 1810 - 1813 it was a part of the French empire. Plans were made to introduce the French system of the university imperiale, but the political events made an end to all these plans.

In 1813, the Netherlands regained their independence. The country became a kingdom under the house of Orange. When the new kingdom was established, no legislation existed for secondary education.

The situation after 1813

The return of the ancien regime did not mean a return to the old situation. The law on primary education for instance remained in force. For higher education a Royal Decree was issued, and in that decree also new rules about the grammar schools were stated. As we can learn from the fact that the rules for the grammar schools were contained in the decree that referred mainly to the universities, grammar schools were seen as the first step to the university. For the type of secondary education that attracted most pupils, the French schools, in theory belonging to the primary education, until the second half of the century almost nothing was arranged by law.

In the Royal Decree of 1815, for the first time the teaching of other topics than Latin and Greek was made compulsory. Some history, geography and mythology should be taught, and also, as was said, "the first principles of mathematics". Nothing more was said about program, content matter, nor to which pupils this lessons should be given, and by whom. The decree only said that these new topics should be taught after the daily lessons in Latin and Greek, thus, as every teacher knows, at an unfavorable time of the day.

We may presume that the obligation of teaching mathematics caused problems for the majority of the grammar schools. Most of them were small, having only one or two teachers. Sometimes the parish minister was the only -part time - teacher, but even when there were more professional teachers, they usually had none or only inadequate knowledge of mathematics. So at some schools a special teacher for math was appointed. Regarding schools where no special teacher was appointed we may have serious doubts about the way mathematics was taught, if it was taught at all. Such a math teacher was often not very heartily welcomed by the regular teachers. First of all, the teaching of mathematics took time away from the teaching of the classics, an idea they did not like. Secondly, often the math teacher - sometimes just the local schoolmaster - did not belong to the class of "learned people", and often did not understand Latin himself. The other teachers felt that such a person should not teach on a grammar school, and sometimes the pupils were of the same opinion. Finally, the appointment of a special teacher costed them money. Such a teacher was often paid with the money that they could have earned themselves, if they had been able to teach math.

An instruction from 1817

We can learn something about the way math teaching was handled from an " Instruction for the mathematics teacher", dating from the year 1817, issued by the board of governors of the grammar school of Franeker. Franeker is a small town in the north of the Netherlands, but at that time it was a university town. We may assume that the teaching in such a town was not at the bottom level. I will quote some relevant articles from the instruction. I. The math teacher

shall teach twice a week, in the building of the school, to all the pupils together, on every Wednesday and Saturday, from 11 until 12 hour, all the year long.
II.....
III. He is not allowed to teach the common arithmetic.
IV. But he will in the first place teach thoroughly the decimal fractions.
V. Followed by a thorough explication of the new system of measurement ,weights and money.
VI. And then he will learn the pupils to apply the decimal fractions to these new systems, because that's important for daily life, and he will train them in converting between the new system and most common old systems.
VI. Only hereafter he will proceed to the principles of geometry, but not before he has instructed and trained his pupils in the use of letters instead of numbers.
VII In the geometric instruction he will begin to learn all pupils all geometric figures, and explain their most simple properties, and gradually use them to rigorous proofs. He will learn them to make geometrical drawings and, for the use in daily life, he will learn them the formula's for the volumes of the solid figures.

We can learn several things from this instruction. First, all students were taught together - possibly all being on different levels of age, knowledge and ability. A complete grammar school comprised six classes. Since there was admission twice a year, in theory there could be 12 levels. Usually a class had his own teacher, teaching Latin and Greek, although due to the fact that most schools were very small a teacher usually combined several classes. So the math teacher in Franeker had to combine all the six classes. The teaching should take place in the school building; we may suspect that the governors had their reasons to state this so explicitly. Second, we note that in this school all students were taught mathematics. That was not self evident. The Royal Decree said nothing about this point, and it was possible to teach for instance only the highest classes. Since "the principles of mathematics " is a very vague expression, one could easily accommodate the program .As we shall see, part of the conflict in Leyden consisted of a disagreement on this point.

Third, we can be surprised by the emphasis laid on practical things, such as decimal fractions and the new decimal system - introduced by the French - of money, weight and measurement. This is not just a local deviation. The archives of the grammar school of Leyden contain a letter of a high government official, pointing out to the board of governors the importance of these subjects and urging the governors to see that these things are properly taught. The importance in "daily life" was then a point being considered in shaping the math curriculum, as it is in the Netherlands today.

Fourth, the teaching of "common arithmetic" was not allowed, so some entrance level was expected from the pupils. The situation that the grammar school served as a primary school with some additional Latin should not return.

All together we may say that the start of math teaching at the Dutch grammar schools was on a low level, and that mathematics teaching hold only a marginal position. In no way for instance the Dutch situation can be compared with the situation at the Prussian gymnasia after the Von Humboldt reform.

Jacob de Gelder

Jacob de Gelder, the principal character of our story, was born in Rotterdam in 1765. He was what might be called of low birth. He went to school for the first time when he was already 9 years old, but by then could read already. It soon came out that he was a talented boy. When he was eleven he entered a French school, a private school, where he learned modern languages and mathematics, for which he had a special gift. After some years he changed from pupil to an auxiliary teacher, now earning his own living. In his spare time he studied mathematics. He was an autodidact; never attending a grammar school nor an university. Some years later he started a school of his own, with a special program for sailors with topics as navigation and

astronomy.He was no the only one in this respect, there were more schools of that type established in those years.

During the French period, a time of great economic problems in the Netherlands, his school broke down and De Gelder had great difficulties in earning his money. He had for a while a part time job as a mathematics teacher for some gentlemen society- he had to teach math to their sons - and participated in a surveying project. This project brought him in contact with military men, and that proved to be important for his further career. In 1814, the new king established a military school, especially for engineers, in Delft. Although De Gelder had encountered some problem with the military, he was appointed as professor to teach mathematics and its applications. But again he got into trouble. He disapproved the way the commanding general managed the school and he was so foolish to write his complaints directly to the king. Although he was presumably right, it was impossible to maintain him at the school. So he lost his job. But nevertheless, he had still friends within the government, perhaps the king himself. In 1819 he was appointed as an extraordinary professor at the Leyden university. There was no urgent need for such a professor, so we may assume that this appointment was a personal favor to De Gelder. At the university he was a bit an odd man out. He never attended a grammar school; although he had learned enough Latin himself to be able to lecture in that language, as was common in the Netherlands until the middle of the 19th century. He also never attended university, so he did not have an university degree. So the first thing the senate of the university did was award to De Gelder a honorary doctorate in the newly formed faculty of Mathematics and Natural Sciences.

The grammar school in Leyden

During the 18th century the Leyden grammar school was on the whole in a steady decline. Around 1800, the number of students was dropped well under 30, with less then 5 new students each year. But under the new rector Frans Anthoni Bosse, who became conrector in 1802, and rector in 1809, things improved a bit.

Teaching methods, only for Latin and Greek of course, were modernized, discipline was better maintained. Maybe due to this measures, or for some other reasons, the number of students slowly increased again. In 1810 a third teacher was appointed. But the increase remained small; when in 1815 one of the teachers was appointed as professor at the university, he was not replaced.

In 1816, as a result of the Royal Decree, a special teacher for mathematics was appointed. The archives of the school contain, except for his name, nothing about his person, nor his teaching. But we can be sure that 5 years later, in 1821, he had left the job. For then De Gelder was asked by he board of governors to become the mathematics teacher of the grammar school.

The conflict at the grammar school in Leyden

We don't know why the board asked him, nor how the governors hit upon the idea to ask De Gelder. De Gelder already had published some schoolbooks and he had on several occasions expressed his ideas about teaching mathematics. So perhaps they thought that by appointing De Gelder they could be sure that they had appointed a man fully qualified for the job. Maybe they also thought that by appointing a professor they enhanced the status of the school.

Why did accept De Gelder the job?. Being a university professor, he could consider it below his dignity. One of the reasons of course why he did accept may have been he needed money. The French period had been a difficult time for him and although his salary as an extraordinary professor was supplemented up to the level he had earned in Delft, he perhaps could use some extra. He had ample time, the university did not really need him. Later on De

Gelder himself stressed that he had wished to put into practice his ideas about teaching, but also that he had missed teaching.

The most complete account of his ideas he wrote down some years later, in 1826, as a chapter in a book on mathematics. The chapter is called "Modus Docendi". We may assume that when entering the grammar school in Leyden as a teacher he had already more or less the same ideas. In this chapter he suggests to divide all students of a grammar school into three groups. To the lower group one should teach the theory of proportions, root extraction, theory and use of logarithms and arithmetical and geometrical series. To the middle group the principles of algebra should be taught, which includes solving linear and quadratic equations and the handling of rather complicated algebraic expressions. In the third group the principles of geometry should be taught, including cosmography. Its easy to see that this is a far more ambitious program than for instance the one of Franeker of some years ago.

The motive is also different. The importance for daily life is no longer emphasized. What matters for De Gelder in teaching mathematics in a grammar school is the "formative value" of mathematics, to learn the proper ways of thinking. In this respect De Gelder represents the new way of thinking about mathematics: not only the practical value but in particular the "formative" value is emphasized.

Until that time, as far as we know, the rector, Bosse, had not expressed himself in public on the subject of the teaching of mathematics in a grammar school. In his welcome speech to De Gelder, Bosse said that he was happy that such a renowned mathematician and excellent teacher as De Gelder would fulfill the job and he said he was sure that his colleague and he himself could learn a lot from De Gelder.

But immediately when De Gelder tried to bring into practice his ideas about teaching, the difficulties began. De Gelder wanted to teach all students, like in Franeker, but divided in two groups. Maybe at that time he did not have already the idea of three groups, or perhaps he thought it was wiser to start less ambitious. His idea was to combine the three lower classes of the conrector with the lowest class of the rector into one group, and to combine the two highest classes of the rector into another group. That idea was unacceptable to Bosse: he wanted De Gelder to teach only his combined three upper classes.

But then De Gelder found an unexpected ally: Delfos, the teacher of the lower classes, felt that his students were discriminated by the rector by not allowing them to attend the mathematics lessons. After an exchange of angry letters between all involved Bosse and Delfos closed their ranks and compromised: De Gelder should teach for two groups, one consisting of the three classes of Bosse, and one of the highest class of Delfos. So the two lower classes should not be taught mathematics.

De Gelder at first refused, and wanted to resign, but he was persuaded at last to accept the arrangement and start teaching. But the atmosphere between De Gelder and Bosse was already spoiled. In one of his letters to the governors Bosse had hit De Gelders Achilles' heel: he described him as an autodidact, clearly implying that De Gelder lacked the background a grammar school teacher should have. Teaching remained troublesome. It seems that De Gelder had difficulties in maintaining order and later on De Gelder complained that Bosse stiffened the pupils in their refusal to work properly. In the fall of 1822 the problems came to a crisis. Because of the difficulties between De Gelder and his pupils Bosse was present at all the lessons De Gelder took care off. During one of the incidents, caused by the fact that the students had not done their homework, the students made a mockery out of De Gelder and, according to him, Bosse joined at the laughter. De Gelder infuriated left the class and again wrote a letter offering his resignation. After some time he regretted his step and wrote to the governors that it was just done in a bad humor and that he wanted to go on teaching. But the board of governors did not agree. They were clearly tired of the constant problems around the math teaching, and they appointed a new mathematics teacher.

De Gelder bitterly wrote that they now had appointed somebody with whom the rector could do what he wanted. In a long letter to the governors De Gelder laid out his complaints about Bosse and sketched his ideas about the way the mathematics teaching should be organized. But the governors were not interested. The chairman described to one of his

colleagues the letter of De Gelder as nonsense and a bunch of lies. There is no doubt that Bosse not only disagreed in organizational matter with De Gelder, but that he also wanted to minimize the content of the mathematics teaching as much as possible. That does not mean that Bosse was only a stubborn conservative. Some years later he proposed the teaching of modern languages on his school; something not prescribed by the law, but considered by Bosse as useful for his students. But in the view of De Gelder mathematics was not taught for his usefulnes, but for its "formative" value. The classical languages had the same claim. In an biography published after Bosse's death it is stressed that Bosse did not have a high opinion about the "formative value" of mathematics, compared with Latin and Greek. He was of course forced by the Royal Decree to accept mathematics teaching at his school, but emphasized that the decree spoke only about the principles of mathematics. In Bosse's view there was therefore no reason to spend much time on mathematics in a grammar school.

An epilogue

It seemed that Bosse had triumphed, but it was a Pyrrhic victory. The problems around the math teaching were not restricted to Leyden. In 1826 the government felt that it was necessary to issue a new Royal Decree, stating a bit more elaborated program for mathematics at grammar schools. The decree shows the influence of the ideas of De Gelder, who after his debacle in Leyden had remained active in propagating his ideas. The decree issued the following program: the principles of arithmetic, the first grounds of algebra, including equations of second degree, and geometry, until plane trigonometry. The government even explicitly recommended the textbooks of De Gelder, in this way also making more clear the content of the program.

The mentionning of arithmetic presumably does not mean the return of the "common arithmetic", that was already not supposed to be taught in Franeker. De Gelders book on arithmetic contains two volumes. The first contains the common arithmetic and extensive training in he decimal system. Considering De Gelders ideas, these topics should be taught in primary school. The second volume contains just those topics mentionned by De Gelder in his program for the lowest group of the grammar school: proportions, arithmetical and geometrical series, root extraction and logarithms. This second volume on arithmetic and his books on algebra for the middle group,and geometry for the highest group form together a complete series for the teaching of mathematics in a grammar school.

In an other decree the government required an university degree in math for a mathematics teacher. But since the government could give dispensation from this requirement, and it often did, this decree was not so important as it seems at first sight .

In a way De Gelder even returned to the Leyden school. In 1828, after some new troubles about the teaching of mathematics, the city government took action. They appointed a special governor to look after the math teaching and, no doubt to the regret of Bosse, they appointed De Gelder. Luckily by that time there was a new board of governors, and also the math teacher who had succeeded De Gelder had disappeared. The new math teacher that was appointed was a pupil of De Gelder, and he reorganized the math teaching according to the ideas of De Gelder. For the next 10 years there were no problems on the grammar school in Leyden. But on the national level the situation remained unsatisfactory. The final exams of the grammar schools, the ius promovendi, remained a local affair, dominated by the teachers of classical languages. One could also avoid these exams by passing an entrance test organized by the university, where the requirements for math were still easier than at most grammar schools. In the first half of the 19th century students meant money for a professor, so they were not inclined to pose too much difficulties to enter the university. Mathematics therefore stayed in a marginal position at most schools.

Only after the legislation of the secondary schools in 1863 and that of the modernized grammar school in 1876 mathematics teaching received a satisfactory position at the school, with standard programs, controlled exams and qualified teachers. De Gelder had paved the way for

that situation. He did this with his publications on mathematics teaching, the writing of his schoolbooks and the advices he gave to the government on teaching mathematics. He also played a role in the development of vocational training, an aspect of his activities paid no attention to in this paper All this makes him a figure of importance in the history of mathematics education in the Netherlands, worth paying some attention to.

Literature:

The literature on the history of mathematics education in the Netherlands is in Dutch. I mention here only some more general works accesible for an international audience.

P.P. Bockstaele, Mathematics in the Netherlands from 1750 to 1830. Janus, 1978, pag. 67-95

V. Cousin, De l'instruction publique en Hollande. Bruxelles 1838

W. Frijhoff, La societé Neerlandaise et ses graduees, 1575-1814. Tilburg 1981

W. Schmale en N.L. Dodde, Revolution des Wissens? Bochum 1991