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van der Geer, S.; Klaassen, C.A.J.

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## WILLEM VAN ZWET, TEACHER AND THESIS ADVISOR

EDITED BY SARA VAN DE GEER<sup>1</sup> AND CHRIS A. J. KLAASSEN<sup>2</sup>

<sup>1</sup>*Department of Mathematics, ETH Zürich, [sara.vandegeer@stat.math.ethz.ch](mailto:sara.vandegeer@stat.math.ethz.ch)*

<sup>2</sup>*Korteweg-de Vries Institute for Mathematics, University of Amsterdam, [c.a.j.klaassen@uva.nl](mailto:c.a.j.klaassen@uva.nl)*

Willem van Zwet was supervisor of sixteen PhD students. All of them pursued academic careers and most of them became full professor. Below are some stories of PhD students Wim Albers, Cees Diks, Ronald Does, Marta Fiocco, Sara van de Geer, Mathisca de Gunst, Chris Klaassen, Hein Putter, Aad van der Vaart, Marten Wegkamp and Martien van Zuijlen with in addition a contribution by Nelly Litvak who was guided by Willem after her PhD.

### 1. Willem teaching.

*Wim* In the late sixties, when I did my MSc, mathematics in Leiden still was very much just “pure math.” Courses offered were on topics like differential geometry, algebraic number theory, measure and integration, etc. But “on the side,” you were allowed one additional topic, be it music or Chinese, whatever. You could even choose . . . mathematical statistics. However, that latter choice was somewhat frowned upon (“throwing dice. . .”). Nevertheless, that was precisely what I did. Although I liked pure mathematics, I really enjoyed probability and statistics, as these subjects were not only beautiful mathematically, but also offered clear views toward applications. But vital in all this was, of course, that Willem’s courses were so inspirational. The influence of having the right teacher cannot easily be overrated!

*Ronald* I followed two of Willem’s courses in the Master phase: Distribution-Free Methods where the book *Theory of Rank Tests* by Hájek and Šidák was treated, and Linear Models where *The Analysis of Variance* by Scheffé was central. These topics did not attract many students, but fortunately the critical mass of five students was attained in both cases. Statistical thinking (the intangible certainty) is different from pure math and I remember the complaints of the other student assistants at the Mathematical Institute when they had done an exam with Willem. They usually did not get very high grades and most of them were already happy with a seven.<sup>1</sup> My last exam was with Willem. If at such an oral exam he had the impression you understood the material well, then he was open for subsequent steps.

*Sara* When I started my Master phase, there was a lecture by Professor Van Zwet on statistics and I decided to give it a try. What a pleasant surprise! Willem told us about asymptotic relative efficiency. I was amazed that a comparison of statistical tests can be made independent of the level of the test and the sample size! The way Willem lectured gave one the impression that he too was still surprised by the beauty of the results. He told us about contrasts in regression, that one could make confidence statements about all contrasts simultaneously. It was as if he told us a little secret that nobody else knew. Willem gave several “Capita Selecta” courses, for example, on contiguity and the Hellinger distance or on Hoeffding decompositions. It was the mathematical face of statistics and I loved it. So with Mathisca and another student, we asked Willem whether we could do a project with him. Yes, he was excited about the idea himself. He gave us a paper on chi-squared tests with estimated parameters. We came to Willem’s office from time to time, the large office with the comfortable

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<sup>1</sup>This is roughly a grade B.

chairs. Willem's attitude in his chair was one of taking the time for it. Time for some deep mathematical discussions. We would write on his blackboard and think on the spot. I wrote some matrix manipulations on the blackboard and behind my back Willem would give some appreciating sounds. I somehow see him relaxed and smoking, although I am not sure he actually smoked. Mathisca and I asked Willem whether we could do a master thesis with him. We wanted to do one jointly. He was in for it; he just received the PhD thesis by J.J. Dik, *Tests for Preference*. We could look at contiguity issues here. So we did. Again we sat in his office discussing and enjoying the comfortable chairs. Willem said: "Why do we want a chi-squared statistic to have the maximum degrees of freedom?" It was not a question from a professor to his students, it was really something that suddenly puzzled him.

*Aad* Willem supervised my MSc thesis. I adapted Daniels' saddle point approximation because it produced bad numerical results. Later I found a paper in which this was already done.

*Mathisca* In my opinion, Willem just taught his courses like most teachers, and he was a distant person like most professors at the time. After doing the final project under his supervision, he showed genuine interest in what you were going to do afterwards, took the time for discussing this and came with good advice. He said that doing a PhD would be lonely work as if advising against it, but he seemed disappointed or disapproving (such things were never clear to me) when I told him that—just in case—I also had applied for a job in industry.

*Marten* I took two courses from Willem. The first was based on his book with J. Fabius (*Grondbegrippen van de Waarschijnlijkheidsrekening*<sup>2</sup>) and the other course was more like a topics course (Hoeffding's decomposition, efficiency, etc.). I very much enjoyed both courses.

## 2. Willem's research supervision.

*Wim* After having Willem as teacher, it was an easy choice for me to go for a PhD in statistics as well. The MSc study had actually been quite leisurely. But after this idling along a straightforward path, things all of a sudden turned into climbing a mountain of knowledge, as represented, for example, by *The Annals of Mathematical Statistics*. Willem was essential in overcoming this initial shock: his calm, confident, humorous and ample support soon helped me to get a grip on matters. In the end, the material in my PhD thesis from 1974 turned out to be pretty intricate; cf. the related 1976 paper in *The Annals of Statistics* by Peter Bickel, Willem and myself. This seems to be the third longest paper in the Annals. We were dealing with asymptotic expansions for rank tests, thus producing formulae, which were longer than long. So we checked the expressions from left to right, as well as from right to left, counting and balancing the numbers of (, ), {, }, [and], of all the various sizes involved. We even constructed  $2 \times 2$  tables while correcting sections: the numbers of errors spotted by both of us, by Willem only, and by me only. The estimated number in the fourth and remaining cell usually was comfortably close to zero (be it that we assumed independence). Unavoidably, some errors nevertheless remained. For example, in our short 1978 correction note, it is remarked that in a certain example  $(\log \log N + \log 2)/2 + 0.05832$  should in fact be  $(\log \log N + \gamma)/2$ , with  $\gamma$  being Euler's constant. The source of this error was some really nasty integral, which I computed numerically. But one of Peter Bickel's PhD students recalculated it and found a different value. So Willem looked at it himself and solved it correctly and quite nicely, thus showing we both were wrong. This is a minor illustration of the fact that Willem always remained the master. Of course, in view of the long list of all his impressive achievements, this is not very hard to admit.

<sup>2</sup>Foundations of Probability Theory

*Martien* After studying Mathematics in Amsterdam, I got to know Willem at the *Mathematical Centre*,<sup>3</sup> where I was employed as scientific researcher. Willem was advisor there and visited the MC each week for half a day. Soon Willem recognized initial steps in my research for a PhD thesis in the area of empirical distribution functions. Subsequently, I often traveled to Leiden to talk to him about the details of my PhD. Lunch was standardly arranged in “home Van Zwet.”

*Chris* In spring 1974, I completed my master’s thesis under the excellent weekly supervision of Kobus Oosterhoff at Radboud University Nijmegen, where students affiliated to the so-called Marxist–Leninist Front kept the math building occupied for several months then. I applied for a temporary job as “scientific collaborator” at Leiden University, in fact, a PhD position under supervision of Willem van Zwet. Kobus said to me: “Van Zwet is the best thesis advisor you can get in the Netherlands.” I’m convinced he was right. The customs of the time were that as a PhD student you had to find your own topic; there wasn’t a project waiting for you. Therefore, Willem’s advice was to read *The Annals of Statistics* and take a subscription, and become a member of the VVSOR (Netherlands Society for Statistics and Operations Research, 1945), and KWG (Dutch Royal Mathematical Society, 1778): “If you don’t become a member, who will.” I noticed Willem was interested in a conjecture of Karlin (1974) in the Annals. In my first year in Leiden, I produced four or five proofs of this conjecture with intricate conditional probability arguments, which were all shown to be wrong by Willem. Nevertheless, my one-year position was prolonged by one year, and Willem said: “Put this problem in a drawer, and in 10 years or so, when you know more, have a look again.” We both did, and the conjecture turned out to be wrong; see Van Zwet (1983), Klaassen (1990). After this first year, Willem told me he had been at a meeting where he discussed with Peter Huber recent papers on adaptive estimators, like Van Eeden (1970), Beran (1974) and Stone (1974). Although these estimators adapt to the unknown underlying distribution and attain the asymptotic information bound corresponding to the underlying distribution, their conclusion was that there had to be some loss somewhere. Willem suggested to study this phenomenon, and his excellent suggestion determined my career. He was interested in many topics and tried to promote curiosity-driven research to his students. I recall vividly the many afternoons we spent staring at the blackboard in his very spacious office sitting in armchairs, coming up with ideas, approaches, corrections, etc. and scribbling them on the blackboard. These afternoons were very inspiring and helpful to me, but every now and then Willem was smoking a cigarette; the only reason I didn’t like to go to his office. After 3 years at the math center in Leiden, the money for my temporary position was used up, but Willem, always taking good care of his students, arranged a research position at the Mathematical Centre in Amsterdam. When my thesis<sup>4</sup> was almost completed, Willem said: “Now, I am going to scrutinize the text and I warn you, many students burst into tears.” So, we sat down together for several afternoons, but I could hold my tears, as far as I remember. Willem’s rule: a thesis should have 100 pages at most. I had 99 (Willem himself 111).

<sup>3</sup>The Mathematical Centre (MC, Mathematisch Centrum in Dutch) in Amsterdam is a national research institute cofounded after World War II by Willem’s statistics teacher David van Dantzig with the idea of contributing to rebuilding society. The statistics department of it was run by Willem’s PhD advisor Jan Hemelrijk, the successor of Van Dantzig. Since 1983, it is called Centrum voor Wiskunde en Informatica (CWI, Centre for Mathematics and Computer Science in English).

<sup>4</sup>Once the thesis has been approved by the thesis advisor, it is sent to an officially installed committee. After approval by the committee it is printed as an official publication and a date is set for the “thesis defense.” At this ceremony, the thesis advisor and the committee are present and the session is chaired by (a stand-in of) the Rector Magnificus. They are all in gown, and relatives, friends and colleagues are invited to attend. In Leiden, this is in a small hall with many paintings of famous Leiden professors since 1574. The PhD student (promovendus) is interrogated by the committee for three quarters of an hour and subsequently the committee decides if the promovendus is promoted to Doctor.

*Ronald* After my oral exam, Willem mentioned to me that there was a vacancy at the Mathematical Centre (see footnote 3) in Amsterdam. He told me to contact Roelof Helmers, the sous-chef of the statistics department. Without a serious application for the job, I started on September 1, 1976. My tasks were statistical consultation, research and preparing together with Kobus Oosterhoff, Richard Gill and Jelke Bethlehem for the course Stochastic Censoring. During my second year there, I spent much time on statistical consulting, in particular on projects of Rijkswaterstaat concerning the Oosterschelde Stormvloedkering (Eastern Scheldt storm surge barrier). Meanwhile, we did all exercises in *Testing Statistical Hypotheses* of Erich Lehmann in a group of 16 young statisticians from The Netherlands and Belgium.<sup>5</sup> These first 2 years illustrate the freedom you had to find your own path as a PhD student. In my third year when another PhD student of Willem gave up on the subject “Higher Asymptotics for Simple Linear Rank Statistics,” he suggested this topic for my PhD thesis. Willem had already paved the way by solving an important technical problem, namely a bound for the characteristic function of the rank statistic. It remained to compute the expansion under sufficiently weak conditions. The results of our common research were published in *The Annals of Probability* and *The Annals of Statistics* in single author papers. Willem said: “They know me already; they have to get to know you.”

*Sara* In 1982, I obtained a PhD position at the CWI (see footnote 3) under the supervision of Richard Gill. As a PhD project gets into shape, one needs to write things down. These writings of course had to be read and commented upon and Willem volunteered to do so. Thus, after about 5 years I was back in his office with the comfortable chairs. But this time we would both sit at his large desk. He would read page by page on the spot and make comments. It worked so well! He gave me ideas, for instance how to avoid assuming the parameter space is compact by using convexity. In the end, I had something publishable. It was published without Willem as coauthor. The question about possible coauthorship was not addressed. In hindsight, I find that surprising and I do not know whether it was common practice at the time, or whether it is Willem’s generosity.

*Aad* At the start of my PhD period, I had no idea what research I would like to do. Willem suggested to write the “final paper” on Edgeworth expansions as conclusion and generalization of the research he had done with other PhD students, and in a similar way as he had done himself for the Berry–Esseen theorem. This didn’t appeal to me and I followed Willem’s other suggestion, to read the Annals and look for something interesting. So I was struggling on a volume of the Annals of about a thousand pages for 5 months. I learned a lot, but it wasn’t fun. A bit desperate I mentioned this to Willem. Then he suggested to think together with Chris about an extension of the semiparametric symmetric location model to a model with a sufficient statistic for the nuisance parameter. This was a success. It resulted in a joint paper, but it also was the basis for a long chapter in my PhD thesis. So, after the first desperate 5 months I succeeded to write something in the next 5 months, of which Willem said that it was already a small PhD thesis—a nice feeling.

*Mathisca* During my PhD period meetings with Willem were not scheduled at a fixed day and time. Whenever you asked for it, he made time for you and a meeting would typically last a whole afternoon or sometimes even a whole day. Even though it still felt very much like teacher and pupil, you would do research together. I really liked to experience this, to see how this worked, thinking and talking and him writing on the blackboard to shape his thoughts, while we were trying to understand the biological phenomenon, to find the proper process to describe it and to derive the mathematical properties of this process.

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<sup>5</sup>Kallenberg, W.C.M. et al. (1984). *Testing Statistical Hypotheses: Worked Solutions*, CWI Syllabus 3, CWI Amsterdam.

*Hein* “Staring at the blackboard together” (that is how Willem himself always called it, I think) was for me very inspiring and valuable.

*Cees* I recall Willem as being extremely helpful as a PhD supervisor, while at the same time he made sure to keep me challenged. One day Willem handed over his handwritten calculations of the variance of a particular U-statistic estimator to me. It was an estimator for a divergence measure between multivariate distributions, which we wanted to apply in a time series context. He told me “This is for independent and identically distributed observations, but you know a lot about time series, so I’m sure you can figure out how to do it for serially dependent data.”

*Marten* Sara was my Ph.D. advisor, but at the time still “Universitair Docent” (Assistant Professor), so Willem (being Full Professor) became my promotor. He daily visited our AIO<sup>6</sup> room (which I shared with Hein Putter, and later also with Marta Fiocco) for a chat. Willem carefully read the thesis before it went to print. I know since I sat next to him for a full week!

*Marta* I moved to the Netherlands in September 1992 to follow my husband. But then I thought, why not do a PhD? The international office for foreign students in Leiden directed me towards a professor in statistics, a well-known scholar. Thank God I knew nothing about Willem then; I would probably not have dared walk up to his door. In fact, our first meeting was not a success. I stammered through a few memorized English sentences using lots of body language, which works very well for an Italian but might be less appropriate for a Dutch professor in his late fifties. Willem very politely but also rather resolutely told me that I should come back to him once the command of my English would have reached a decent enough level to have a proper conversation. So I did, and our adventure together lasted from June 1993 until 2002 when I moved as a statistician to the Leiden University Medical Centre. If I look back at that day in October 1992, what strikes me most is that Willem gave me a chance. He knew nothing about me, a naive Italian girl with only a diploma from the university of Padova. Why did he believe in me? In later years, he has lectured me about the necessity of knowing the English language, and of course we both always laughed thinking about our very first meeting. I believe Willem had the talent to understand people, which is rather unique. He was not only a brilliant math professor, but also understood human nature. I learned a lot from him and I behave with my own PhD students much like Willem used to do with me, although not with everything. During the 4 years of my PhD I always had to address him with “u”<sup>7</sup> and call him Professor. The day after my PhD exam he told me: “You can call me Willem now and address me with “jjj”<sup>8</sup>” We’d been speaking in English for 4 years so it didn’t really make a difference, and we had another good laugh about this.

### 3. Willem’s support.

*Wim* After my PhD, I held chairs in statistics jointly at medical and health science departments, as well as at a technological university, which obviously stimulated my interest in applications. Publications in *The Annals of Statistics*, and in *JASA* kept occurring from time to time, but the main stream spread out over journals such as *Statistics in Medicine*, *Biometrics*, *Psychometrika*, *Technometrics*, *Scandinavian Actuarial Journal*, etc. This might seem a rather haphazard process. However, the “Leitmotiv” always was the introduction and study of new, more robust methods, and to compare their performance to the existing practices, using refined second-order techniques. So the elaborate “tricks” Willem taught me, have served me throughout my career, for which I am truly grateful.

<sup>6</sup>AIO = assistent in opleiding; assistant in training

<sup>7</sup>Formal version of “you.”

<sup>8</sup>Informal version of “you.”

*Martien* I cherish very positive memories of my collaboration with Willem. I could get along with him very well and he helped me in various ways. I owe him a lot. I always considered Willem as an international top-scientist, who loved discussion. He was very bright, communicated extremely well, knew how to judge people's value, and combined this all with a strong feeling of responsibility and a great amount of stability and perseverance. Willem played a major role in the development of Mathematical Statistics at Dutch Universities.

*Chris* Shortly after my PhD, I returned to Leiden as assistant professor to the chair of Willem. He always supported me, for example, in applying for a PostDoc position at the MSRI in Berkeley under supervision of Peter Bickel. Richard Olshen at MSRI: "So, you're from Holland. You know Van Zwet? *He* speaks very good English. You have to listen very carefully for some time to hear he's not from the Mid West." Once Willem said: "I don't publish with my PhD students about their work." Nevertheless, I could twice convince him to do so. He was also keen on acknowledgments: "When in doubt acknowledge." I am not in doubt: "I owe Willem a lot."

*Ronald* Willem was an altruistic teacher. He supported you at all your steps toward independent researcher, introduced you to his colleagues (Bickel, Chibisov, Lehmann, Pfanzagl and Pyke, to name a few). He moreover felt that you had to find your own way. When after my PhD, I indicated to see my future in applied statistics (first medical statistics and later industrial statistics), he supported that wholeheartedly. He also maintained contacts. We met at congresses, and of course once every 5 years after his retirement, when there was a jubilee birthday to celebrate.

*Sara* I had jobs here and there, and then a position in Leiden, formally not yet one where I could supervise Ph.D.'s. Marten was Willem's student who I supervised under Willem's guidance. The three of us would sit in his office with the comfortable chairs and discuss. I left Leiden and came back as successor of Willem. As I am writing this now, it comes across to me as quite unbelievable! I inherited a similar office as Willem's, but those armchairs were pretty worn out and smelled of dust and old cigars. Things changed at Leiden, modern times were there. But Willem remained the same famous authority. He supported me through a Vici<sup>9</sup> grant application, which I did not get. He was as angry as I was about this. We worked together as editors of *Bernoulli*. Willem got a stroke, but recovered quickly. The years went by. We saw each other at workshops and conferences, in Lunteren<sup>10</sup> for example. Every 5 years we organized a dinner with Willem for his birthday. It was always a pleasure to eat and drink with him, and listen to his amazing stories! At Oberwolfach, it made me happy when my napkin landed on the same table as his. Then entertainment was guaranteed!

*Mathisca* One time Willem said: "You women always tell a reason why you cannot do something at a certain time. No need to do that. Men just say that they have something else to do or that they do not have time." Here are some of his mottos, principles, advice:

- You do not have to tell everybody everything all the time, but never say something that is not true.
- When you referee a paper, always keep in mind that you deal with a person. Don't be rude but be kind and polite.
- Willem's guideline was to never do joint research with one of his former PhD students. In his opinion, once Dr., a former pupil needed to find her/his own way; to keep working with their former supervisor could be in the person's disadvantage.

<sup>9</sup>Veni, Vidi and Vici grants are allocated by the Dutch Research Council NWO.

<sup>10</sup>Willem initiated the famous annual meetings of the Dutch probability and statistics community at Lunteren. These meetings with only lectures by researchers from abroad started in 1973 and have contributed considerably to the coherence in the Dutch stochastics community.

I always had and still have the feeling that Willem is there all the time. This feeling changed from strict but just educator via compassionate supervisor to a scientific father, always ready for advice, support and a drink.

*Cees* Willem also was extremely helpful in guiding the career choices I was facing. One particular issue was the compulsory military service. In 1995, the last year of my PhD project, it was announced by the Ministry of Defense that the Netherlands would switch from a compulsory to a voluntary military service system the next year. I would be drafted into one of the last cohorts immediately after graduating. I asked Willem: “Wouldn’t it be possible for me to take another year to complete my thesis?” and to my surprise he immediately said: “It’s a very simple calculation. If we extend your contract for another year, and you write another paper during that year, that is a cheap paper for the university and you are better off as well.” And so it happened.

*Marten* I am grateful, too, to Willem for all his support when I applied in 1996 for a position at Yale University. The last time we met was at Aad van der Vaart’s 60<sup>th</sup> birthday party in Leiden.

*Nelly* My story is connected to two places that were important to Willem: Prague and EURANDOM.<sup>11</sup> I met Willem for the first time at Prague Stochastics 1998, my first large international conference. At that time, I was working at Nizhny Novgorod State University, Russia. Swift democratic changes had detrimental effect on Russian Science. While senior staff was surviving holding two or three jobs, junior scientists often tried their luck abroad. At a break during the conference, a USA-based Russian statistician advised me to talk to that tall Dutchman, Willem van Zwet: “He has recently organized a new institute, they are hiring right now.” Willem asked what area I was working in, and he had to ask three times before he could infer from my answer with a heavy Russian accent that it was “queueing theory.” I was lucky, because queueing theory was a major topic at EURANDOM. Willem attended my talk and somehow I felt that he believed in me. This feeling was with me every day of my further career. I joined EURANDOM in June 1999 as a PhD student. EURANDOM was Willem’s idea. It became a very special institute. We were young researchers from all over the world: Germany, Italy, Turkey, USA, India, China, Russia, Senegal, Portugal—you name it. We worked together and we became friends. At lunch breaks, we talked about Dutch food and weather, at parties we cooked national dishes and once we even made a round of lullabies in our national languages. We explored the Netherlands together by bike and by train. The secretaries and the managing director were our welcoming Dutch hosts. It was a dream place to be.

Willem created EURANDOM at the Eindhoven University of Technology to give a boost to probability and statistics in the Netherlands. There was an explosion of activities, collaborations, conferences and workshops. The best people in the world came to visit, the latest ideas were discussed and developed. Although EURANDOM does not hire postdocs anymore, it is a world-known workshop and conference center, meeting place in probability and statistics, part of Willem’s legacy. Willem was not officially my advisor but he followed my progress, and his confidence in me meant a lot. My advisor Ivo Adan and I were working on a problem of the warehousing carousel, where items are stored on rotating shelves, and we need to collect an order of  $n$  items. We could determine the distribution of the time it takes to complete the order. Willem loved this problem and together we ended up coauthoring a paper about the optimal route. We submitted it to *The Annals of Applied Probability*, and the review was so laudatory, that Willem said, “You should frame it and hang on the wall.” Last time I saw Willem, we had lunch in his Society De Witte (1782) in The Hague. He was smiling, proud of me, and reassuring, as always. Willem had the gift and the courage to look not only

<sup>11</sup>European Unit for Research and Analysis of NonDeterministic Operational Models



at publications, but at people, to believe in people, and to give chances. He gave me a chance of a lifetime. I have been and will be grateful for that every single day.

#### 4. Further stories.

*Sara* Writing in LaTeX was not yet invented in 1986 and all drafts were handwritten. It was my great hobby to rewrite and rewrite, start afresh and try to make it into something really elegant. With the result, I went full of expectations to Willem's office. He started his reading page by page. He seemed a bit confused. Suddenly I realized the pages got mixed up. This was not funny. Willem really called me to order, and never in my life shall I be so careless again. It is difficult to accept that Willem is no longer there, that this chapter is closed. I lost a scientific parent.

*Ronald* Willem's last message to me, which I received in May 2019, was:

*Dear Ronald,*

*Somewhat delayed skimming through the March issue of STAtOR I encountered a known face. Except for some grey hair you changed very little although in your PhD thesis I noticed the year of birth 1955 so you must be approaching the retirement age. I am aware that in your career you did not face a lack of appreciation but the Shewhart Medal seems to me to be special enough to congratulate you. I wish you many more good years.*

*Many greetings,*

*Willem*

It signifies his involvement also at older age.

*Mathisca* Willem would never hide when there was something he did not know, which in the beginning I was surprised about—both about the fact that there was something he did not know and that he did not conceal this. In such a situation, he would knock on the door of a colleague who might know. He was not someone who immediately made you feel comfortable. In the very beginning, when I had written something that I thought he did not understand immediately (or more likely, I think now, judged it to be rubbish immediately), he did not pay attention to your stuff anymore, but started thinking from the beginning himself. On the other hand, he really took care to educate you and to make sure that you would develop your talents and made the best possible career, in a way that would suit you as a person. He was well aware of the differences between his students, treated them differently, but never let them down. At a conference, he would sometimes say “Let's go for a little walk” and then he would introduce you to one of his colleagues whose research was in the area of your PhD. Sara and I were “De meisjes van Van Zwet.”<sup>12</sup> At the time, female PhD students were rare. Willem was quite proud to be the champion with supervising two at the same time, and later on one more. Once he told me that he had learned a lot from having had female students. Unfortunately, at the time I was too shy to ask what kind of things he learned.

*Cees* When I was a postdoc with Howell Tong in Canterbury, he told me with a smile on his face: “You know, I met your PhD supervisor, Willem van Zwet in Oberwolfach. I really enjoyed meeting him; he got, as we sometimes say ‘well lubricated’.”

*Marta* Laughing together we did a lot. When I was stuck with my proof and I felt desperate, he always gave me courage. My PhD was at the intersection of statistics and percolation theory and he'd never dared enter a field so unfamiliar to him, but he helped me to be brave and soldier on all the same. I remember that he invited Geoffrey Grimmet from Cambridge to discuss my PhD research and to try to solve some problems by using Geoffrey's knowledge, since he did not know how to do it himself. To admit he didn't know something, is another valuable lesson he taught me: research is collaboration, not competition, and it is okay to ask

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<sup>12</sup>“The girls of Van Zwet”

other experts for help. My PhD was not easy. I was a bit intimidated in the beginning, after our auspicious first meeting, but Willem was always kind and had a lot of patience to spend time with me. I told him many times he had chosen a subject, which was too difficult for me, and he used to laugh, telling me “I trust you and I’m sure you will manage.” Willem has a special place in my heart. I’m so glad he gave me this wonderful chance; it is partly due to him that I made this country my home. Without him, my life in Holland would have been completely different.

**5. PhD theses supervised by W. R. van Zwet.** Willem was the promotor (first thesis advisor) for all his students with two exceptions. For Ivo Molenaar, he was the copromotor (second advisor) and Jan Hemelrijk the promotor, and for Sara van de Geer both Richard Gill and Willem were promotor. When applicable, the extra (co)promotor is indicated.

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