LEARNING FROM ATTITUDES*

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Abstract: *From 1985 to 1989, I worked at the Kapteyn Laboratory - which is part of the Astronomy Faculty of the University of Groningen, The Netherlands – on my doctoral thesis project. During the whole period Prof. Hugo van Woerden was the Chairman of the Laboratory. From my recollections of that time I tell here three episodes in which Prof. van Woerden's attitudes are put in focus.*

Keywords: *graduation, mastership, memories, The Netherlands, Hugo van Woerden*

1. Introduction

How did I come to all of this? Below, a few words on my trajectory to the University of Groningen.

My undergraduate studies were in Physics, pursued in the Federal University of Minas Gerais, at Belo Horizonte, Brazil. One year after finishing my studies, in 1977, I joined the Physics Department of the Federal University in a temporary position, that was turned into a permanent one some years later.

In 1982, I began my master dissertation work under the supervision of Prof. Ramon J. Quiroga, a radio-astronomer, who had joined the Astrophysics Group of the Physics Department some years earlier. Prof. Quiroga is mainly known for his investigations on the corrugations of the HI layer of the Milky Way galaxy. My dissertation's project was dedicated to the study of the dynamics of the local zone, the solar neighborhood. During this work I came inevitably into close contact with earlier and seminal work on the subject by Kapteyn and Oort.

In 1983, I was ready to go into my doctoral project. There was the possibility of support from the Brazilian government for studies abroad. My choice then was easy: I would like to study in the land of Kapteyn and Oort! My application was accepted by the Brazilian agency CAPES. The acceptance was very much eased by the collaboration of the Kapteyn Laboratory and Prof. Robert H. Sanders, that promptly accepted to be my advisor during the first years. Subsequently, I was lucky enough to have the advisory collaboration of Prof. Tjeerd S. van Albada.

By the beginning of September 1985, with wife and daughter, I arrived in Groningen.

I had four years and two months of hard and happy scientific work at the Kapteyn Lab. During this period I got in touch with great scientists in the field. Prof. van Woerden was one of them.

Here I present some of my recollections rightly related to Prof. Van Woerden's

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* Editor's Note: In addition to reflections on the ways of specialized teaching, the possibility is opened to another research, a kind of *pedagogy of pedagogy*, the investigation of subliminal procedures by means of which, beyond any particular significance, the building up of a personality is realized and the die is cast on its destiny (Gusdorf, Georges: Pourquoi des professeurs?, Petite Biblioth\`eque Payot, Paris, p. 10, 1963). Nota do Editor: Al ém da reflexão pelos caminhos do ensino especializado, abre-se a possibilidade de uma outra pesquisa, uma espécie de *pedagogia da pedagogia*, a investigação de procedimentos subliminares por força dos quais, acima de todo conteúdo particular, se realiza a edificação de uma personalidade e se põe em jogo o seu destino.

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attitudes. They created in my spirit a great sense of respect and admiration. I selected three episodes: Prof. Oort's visit to the Lab, a colloquium on the ozone hole, and the repercussion of Halley's comet appearance in 1986.

2. Oort cloud

Prof. Jan Hendrik Oort came to visit Kapteyn. After a short lunch talk, he was ready for a formal colloquium in the afternoon on one of his most favorite themes: comets.

The ample audience was composed by students and senior astronomers, including many foreign visitors.

The large room was barely illuminated by the lights from the projector. At certain point, as Prof. Oort changed transparencies, he switched also the idiom he was speaking, from English to Dutch. My recollections are not quite clear but I think the possible reason was a transparency with diagrams and some text in Dutch. That might have triggered the unintentional change of language. There was a bit of surprise and astonishment but everybody seemed to expect that he soon would switch back to English as he realized what was happening. But that was not the case. Prof. Oort was deeply involved in his lecture and went on in Dutch. Something ought to be done but who would dare to interrupt him and call his attention to the fact?

Prof. Renzo Sancisi, sitting in the front row, on the left side, made, what seemed an intelligent move to restore normality. He prompted a question to Prof. Oort, in English. The audience, as far as I could judge in the occasion, immediately realized what he was trying to do. Prof. Oort listened to him with great attention, thought for a moment, and answered. In Dutch! It didn't work... Still, something should be done.

Here then came Prof. van Woerden, which was also sitting in the front row, on the right side, in rescue. Taking advantage of his combined authority of being colleague, student, admirer and friend of Prof. Oort, he gently stood up, and said: *"— Jan, you are speaking Dutch. Please, would you switch back to English? We have many foreign guests in the audience."*

Prof. Oort smiled surprised and said back: *" — Oh, sorry!"* And immediately everything turned into its right course.

3. Ozone hole

An American astronomer, a visitor that had been other times in the Lab and made important collaborative research based on the IRAS data, was giving an abnormally lengthy lunch talk, usually devoted to short talks. His subject was the effect of the CFC compounds on the ozone layer of Earth's upper atmosphere. He had used archive data from an early satellite and after exhaustive and rather intricate analysis came to the conclusion that damages to the ozone content of the atmosphere had lessened and that the ozone hole was even diminishing. The audience listened with a mixture of impressions between surprise and doubt. Anyhow, how could one contest scientific analysis? Only with scientific analysis, of course. But then, the talk was over and the question session began. Prof. van Woerden made the first — and as it came to be, the last question: *" — Did you receive financing from the CFC industry for your research?"*

The speaker, old fellow in the Lab, looked to his questioner, with a light smile, and

after some seconds answered simple and plain: *" —Yes."*

There was a sort of resignation in his attitude, a resignation to the fact that everything he has been talking about would be put in definite doubt. Indeed, the whole audience laughed at large. The question session was over, as well.

Incidentally, more than 10 years later, an episode like this happened in the University where I work in Brazil. In an interview to the University's news bulletin, a biologist made an unambiguous apology of transgenic vegetables as food supply for humans. Given the precarious stage of research in the field and the absence of conclusive results on the possible effects on human health by the indiscriminate use of transgenic food, I thought that a variant of Prof. van Woerden's question was necessary here. I wrote a reply to the bulletin and asked, mentioning as an antecedent the ozone case: *" —Did you receive financing from the transgenic industry for your research?"*

The text was not published under the allegation of lack of space. There were many replies to the bulletin in response to the controversy raised by the interviewee. In any case, I sent my text to a national-wide electronic news list, organized by the Brazilian Society for the Advancement of Science, where it was publicized.

By the way, I got no answer from the biologist.

4. Halley's comet

Theo A. Jurriens, then a member of the Lab's technical and administrative staff, during a trip to La Palma, took a beautiful photograph of comet Halley, showing up just above the mountains and with a starring background. The photo, later turned into the 1986

Christmas card of the Kapteyn Lab, is shown in Figure 1.

Figure 1: Kapteyn's 1986 Christmas card: photo by Theo A. Jurriens, spring 1986, at La Palma (~28° 45′ latitude). The exposure was 2 min.

Prof. van Woerden, motivated by the picture, put forward a prize contest. The one

who extracted as most information as possible from the scene would win the prize.

I must confess that my reply to the contest was not that brilliant: the identification of some stars in the Sagitarius region, speculations about the identification of globular clusters in the neighborhood of λ Sgr, and nothing more. Of course, I was rather curious about many of the features on the picture but did not risk any further comment.

After some weeks, to my surprise, the prize was mine! And not just one but two! Prof. van Woerden was very kind in giving me the prize, in spite of my poor answer, and besides that gave me a second one: a sheet of paper where he listed 8 facts he could extract from the scene!

The manuscript is shown in Figure 2 and its transcription follows. I apologize for any eventual mistakes I might have committed in the transcription.

Prize Contest: Sky Photo from La Palma

1. The slant of star trails, rising to the right, shows stars are rising, not setting, hence we are facing East (roughly). (This is valid for the N hemisphere).

2. Length of star trails is rightly more than 1 mm. Equivalent to 2 min = 0.°5. Hence scale of photo: 1° = 2 or 2.5 mm.

The area shown, 5 × 12 cm, is then roughly 20° × 50°.

3. The striking trapezium in the lower right has an EW diagonal of about 17 mm ~ 7 or 8°.

4. There is a bright glow in the centre of the photograph, slightly rising to the right. This cannot be twilight, that would be flatter along the horizon. It might well be the zodiacal glow. In that case th trapezium would be some 10° or 15° below the ecliptic. The glow is not from Santa Cruz!

5. Since the photograph was taken in spring, and since zodiacal glow is seen, it must be early morning and right ascension must be around 18 or 20 hours. On this basis a scan of a sky atlas is possible.

6. This scan strongly supports identification of the trapezium with σ-τ-ζ-φ Sagittarii. The diagonal τ-φ is about 5° long; hence 1.2 mm ~ 0.°35, suggesting an exposure of only 80 - 90 seconds. The pattern of stars, however, is convincing.

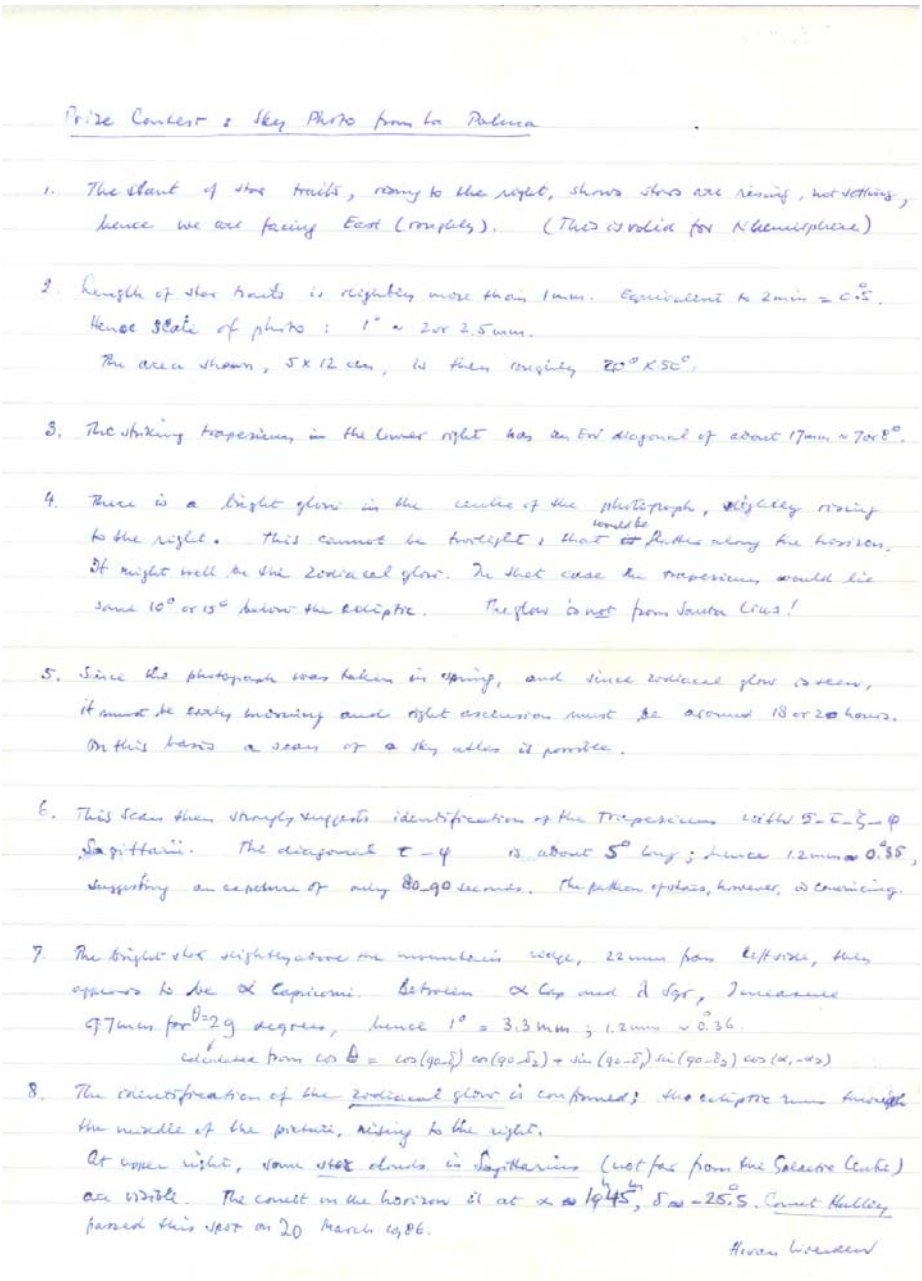
7. The bright star slightly above the mountain ridge, 22 mm from left side, then appears to be α Capricorni. Between α Cap and λ Sgr, I measure 97 mm for θ = 29 degrees [calculated from $\cos\theta = \cos(90 - \delta_1)\cos(90 - \delta_2) + \sin(90 - \delta_1)\sin(90 - \delta_2)\cos(\alpha_1 - \alpha_2)$*], hence 1° = 3.3 mm; 1.2 mm ~ 0.°36.*

8. The identification of the zodiacal glow is confirmed; the ecliptic runs through the

middle of the picture, rising to the right.

At upper right, some star clouds in Sagitarius (not far from the Galactic Centre) are visible. The comet on the horizon is at $\alpha \sim 19^h\ 45^m$, $\delta \sim 25.°5$. *Comet Halley passed this spot on 20 March 1986.*

H. van Woerden



Prize Contest : Sky Photo from La Palma

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2. Length of star trails is slightly more than 1 mm. Equivalent to 2 min = 0.°5. Hence scale of photo : 1° ≈ 200 2.5 mm. The area shown, 5 × 12 cm, is then roughly 20° × 50°.

3. The striking trapezium in the lower right has an E-W diagonal of about 17 mm ≈ 7 or 8°.

4. There is a bright glow in the centre of the photograph, slightly rising to the right. This cannot be twilight; that would be further along the horizon. It might well be the zodiacal glow. In that case the trapezium would lie some 10° or 15° below the ecliptic. The glow is not from Jupiter (Leo)!

5. Since the photograph was taken in spring, and since zodiacal glow is seen, it must be early morning and right ascension must be around 18 or 20 hours. On this basis a scan of a sky atlas is possible.

6. This scan then strongly supports identification of the Trapezium with δ-ε-ζ-φ Sagittarii. The diagonal ε-φ is about 5° long; hence 12 mm ≈ 0.°35, suggesting an exposure of only 80–90 seconds. The pattern of stars, however, is convincing.

7. The bright star slightly above the mountain range, 22 mm from left side, then appears to be α Capricorni. Between α Cap and β Sgr, 7 measure of 7 mm for θ = 29 degrees, hence 1° = 3.3 mm; 1.2 mm ≈ 0.°36.
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At upper right, some star clouds in Sagitarius (not far from the Galactic Centre) are visible. The comet on the horizon is at $\alpha \approx 19^h 45^m$, $\delta \approx -25.°5$. Comet Halley passed this spot on 20 March 1986.

Hivan Woerden

Figure 2: Prof. van Woerden's manuscript with his own reply to the prize contest.

5. Concluding remarks

What is a wise man? Why is a man a master to his fellow ones? There are certainly many answers to these questions. I shall not risk myself on any. I shall just finish naively stating that from wise attitudes many lessons are learned. There is no science here, of course.

There is only the admiration and respect for Prof. Hugo van Woerden.

Acknowledgements

I thank my wife Maria de Lourdes S. Soares for her help in the transcription of Prof. van Woerden's manuscript and for recalling some details of Oort's episode. I wish also to thank Dr. Paulo Sérgio S. Guimarães for reading an earlier version of the text and for useful suggestions. Helpful comments from anonymous referees are gratefully acknowledged.