

Roelof Oldeman, the grand old man of the forest

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First encounter

Hinkeloord, this is the place where it all began. When I walked up to the mansion for the first time, in 1980, the thought struck me that in such a building it might be possible to develop a personal relationship with staff members. I was hooked. Not knowing what I was in for, I registered myself as a student of tropical forestry.



Meeting Prof. Oldeman is a memorable experience. I remember well his entries in the lecture hall. A towering figure appears, clad in a green cape, his posture a striking blend of Sandeman and Zorro. So I had met with Prof. Oldeman: a lucid, multilingual, well-spoken gentleman, who travels all continents and boasts a wide range of interests that includes his students. These were the beginnings of our very dear friendship that now spans two decades (... well, almost). The image shows Hinkeloord.

In the mid-eighties the department was vibrant and thrived. Here I recall the frequent media attention, the international staff/student IUFRO meetings, the birth of the Canopy Foundation (*Stichting Het Kronendak* in Dutch), the BOS foundation, and Tropenbos, celebration of the centennial of forestry education in Wageningen and, under Prof. Oldeman's guidance, my apprenticeship at CATIE in Costa Rica and laying foundations for a national park that was established on the highest summit of the Kingdom of The Netherlands on 'The Mountain' of Saba, the smallest island of the Dutch Antilles (Romeijn, 1987 and 1989; and WWF, 1997).

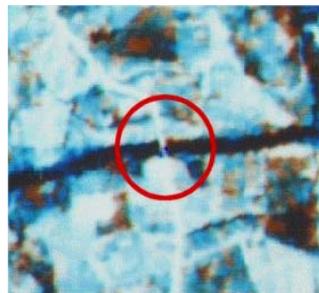
Enter Science

Prof. Oldeman's scientific excellence hardly needs an introduction; for beginners his book 'Elements of sylvology' (Oldeman, 1990) is a good point of departure. In my dissertation I referred to the fact that from his lessons "I have learnt most and understood least" (Romeijn, 1999a). Early on in his career, Prof. Oldeman started out in French Guyana with little more than pencil and paper, and the forest of course. There he developed the fundamentals of tree architecture and forest structure dynamics, together with Prof. Francis Hallé. The concepts were initially ridiculed, in The Netherlands rather than in France, for having no practical use.

Tree architecture and forest structure dynamics are such elegant and simple concepts that they are difficult to grasp, much like Einstein's $E = mc^2$. A number of very bright-minded young persons did follow-up the concepts and they proved to understand them as, e.g., Vester (1997) and Van der Wal (1991) did in their *cum laude* dissertations. Meanwhile, proof that these concepts correspond to realities in world of physics would come from a completely different angle: from space. In the early days of space exploration, someone dreamt up the clever idea

to point the satellite instruments upside down, i.e. towards earth, which marked the beginning of what we now term remote sensing or earth observation.

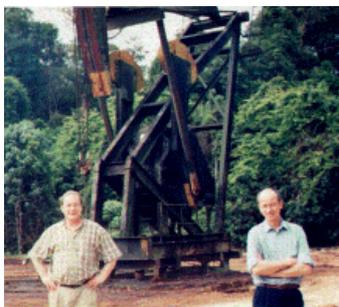
Spaceborne images suffer from deformations, made by the convex shape of the earth, rugged terrain, mountains, different instruments (e.g., radar, infra-red, optical) or camera positions or resolutions (when working with multi-temporal images), to name but a few. At Privateers NV, the problem of how to fit the pixels from different satellite images precisely on top of each other has been largely solved, witness the highly accurate contour maps of Southern Ethiopia that were made to help research the Gedeo land-use system (Kippie *et al.* 2001). This allows for proper pre-post analysis of major catastrophies, including earthquakes and hurricanes, given the proper processing software that is. Now that this has been combined with speed, the satellite image processing operations can follow events in near real-time (as reported in, e.g., Nezry *et al.* 2001, and BBC, 2001, for the case of an earthquake in El Salvador).



Dr. Francis Yakam of Privateers NV shows this to good effect in the case of the damage caused by Hurricane Mitch. To the left we see him during ground truth inspection of a damaged bridge in Honduras, to the right is the corresponding image. In Tegucicalpa, individual houses that were damaged were correctly identified (Yakam *et al.* 2000).

Once this level of precision of image processing was attained, Privateers NV worked to develop applications that were of practical use to forest monitoring. This is actually quite difficult and at Privateers NV we habitually refer to remote sensing as being ‘very remote with little sense’. Finally, it took us seven years of research to crack the nut of how timber volumes can be derived from satellite images with good results. The matter boiled down to one central question of physics: How does a radar signal behave within the forest canopy? The answer to this question was located within the cornerstone concepts of tree architecture and forest structure dynamics developed by Prof. Oldeman, precisely (Nezry *et al.* 2000a).

At this point I would do great injustice to Prof. Oldeman if I give the reader the impression that his scientific contributions are limited to the subjects described above. Over the years,



numerous fruitful discussions have led us to many ‘places’. Fractal geometry is one such ‘place’. Fuzzy logics is another. This teaches us that history can only repeat itself in *similar*, and never in *identical* ways. Fuzzy logics was quite elegantly practiced by Jane Shaw in her work on complex land use systems in the American Appalachians (Shaw, 2002). Hutan Lestari is yet another one of these places. This Indonesian initiative was housed at Wageningen University. It has led to numerous dissertations by Indonesian students (e.g., Indrabudi, 2002) and, indirectly, to a

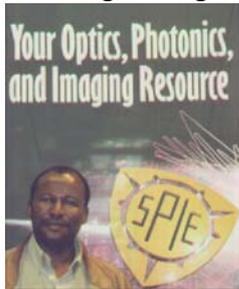
Privateers NV forest monitoring mission to Sumatra in the context of a project for the Japanese Space Agency, NASDA (Nezry, 2002). The image shows Supit (to the right) and Romeijn inspecting a forest disturbance in central Sumatra, Indonesia.

Other special places are those of the rhizosphere and its aboveground counterpart, the phyllosphere. Both these environments, of the roots and the leaves, were largely *terra incognita*. For improvement of our understanding of these environments, Prof. Oldeman has

made great contributions. Here I take only the phyllosphere as an example because this is the sphere that I am most involved in. Prof. Oldeman is co-founder and the current Chairman of the Canopy Foundation. Over the last decade, the Canopy Foundation supported over 60 scientific publications in its field (ref: <http://www.treemail.nl/kronendak> and do view, e.g., Visscher, 2002). The Foundation instigated the new chair of Canopy sciences at the University of Amsterdam, currently held by Prof. Jan Wolf (Wolf, 2001). To help rationalize use of the phyllosphere, Prof. Oldeman developed his copyrighted concept ‘canopy farming’. Canopy farming © leaves the forest essentially intact: “cultivation of canopy products takes place within their natural habitat itself, *i.e.* the canopy” (Van Weezendonk and Oldeman, 1997). It seeks to maximize added value, with minimum mass. In its purest form this relates to information (Romeijn, 1997). Canopy farming © thus starts there where extractionist concepts stop. The image shows the canopy raft over tropical high forest in French Guyana. This raft was designed in the late eighties by Prof. Francis Hallé, together with a pilot and an architect (photo: © Oldeman).



The Gedeo Country, in the Southern Highlands of Ethiopia, is another one of these special places, too. Tadesse Kippie, a native Gedeo born of illiterate parents, described the ancient Gedeo land-use practice in a dissertation that was supervised by Prof. Oldeman. The system feeds over 450 people/km² in a rugged mountainous tropical region. This is achieved without terracing, tilling or agrochemical inputs, while soil fertility and a strong performance in security of production are retained; a matter of life or death to local farmers. Tadesse Kippie found that food- and production- security are largely safeguarded by maintaining a complex, multi-rotational system with high biodiversity. The staple crop Ensete plays a key-role as a pacemaker species; Kippie described its cultivation in different climactical zones and its processing. Understanding this unique land use system is likely to be of high relevance to establish or maintain biodiversity and food security in all mountainous tropical areas of the world. Dr. Kippie’s dissertation is a unique document as it is a true inside job, and because it touches upon a number of very fundamental issues in both forestry and agriculture (Kippie Kanshie, 2002, and Nezry *et al.* 2000b; also see Diamond, 1997, and Monbiot, 1989). The image shows Dr. Kippe at the 8th International Symposium on Remote Sensing of the International Society for Optical Engineering, SPIE, in Toulouse, France.



Exit Science - - enter politics

One should bear in mind that science provides no guarantee for fair play. The late and much respected Professor of Philosophy at Berkeley, Paul Feierabend was well aware of this and wrote: “Financial arrangements can make or break a research programme and an entire profession. There are many ways to silence people apart from forbidding them to speak - and all of them are being used today. The process of knowledge production and knowledge distribution was never the free, ‘objective’, and purely intellectual exchange rationalists make it out to be” (Feierabend, 1993, pp 126-127). The great Prigogine sensed this at the time, too. “Tradition tells that as a result of a hostile religious and social reaction, philosophers were accused of atheism and were either exiled or put to death” (Prigogine and Stengers, 1984). Since we know Prof. Oldeman has not yet been put to death, the attentive reader is able to figure out what fate was bestowed upon him by staff members, managers and politicians who

were comforted by the blessings and support they received from civil servants. Prof. Oldeman, however, did not stand alone in his fate as I was able to figure out only later.

There is a larger picture that has to do with the role of science within the society at large. Towards the end of the nineties, I described it as follows: “Once upon a time, in the dark Middle Ages, the Church held the Keys to The Truth. The Church had forgotten its mission and vision. It sold Variations of Truth as letters of indulgence. [...] Today, in the twilight of the Age of Enlightenment, Science holds the Keys to The Truth. Science is in the process of forgetting its mission and vision. It sells Variations of Truth as research results and provides its commissioners with highly desirable absolution; be it in an environmental, financial, legalistic or even ethical sense. Once again The Truth has become a commodity; it can be sold rather than searched. In retaliation, scientists now circumvent the prevailing peer review system by publishing their research results directly over the Internet” (Romeijn, 1999b). Indeed, today, Wageningen University sells its name to promote, e.g., detergents in TV commercials.

And back to the forest

The aforementioned *elements of sylvology* do not tell the whole story. There are many ways to look at forests, and there can be no doubt that Prof. Oldeman has come to grips with several of them. This is no mean feat, as these ways are related to human perception and because human perceptions differ greatly from one culture to the next. Prof. Oldeman is well aware that forests exist within several, complex, contexts. Perhaps this is best illustrated by the interdisciplinary treatise ‘Struggle of life: or the natural history of stress and adaptation’ (Rossignol *et al.* 1998). This book has remained little known and, as yet, little understood, possibly because of the wide subject range that it encompasses. The ‘Struggle of life’ simply teems with farreaching, novel ideas; and it offers in-depth views of complex systems, from subcellular-, to climatic- and solar- system level. The work reminds one of the old Chinese proverb: “When a mouse looks at the tree, it sees the sky” (Quing Zhu, 1299). Following its appearance in 1998, the findings reported in ‘Struggle of life’ have been substantiated by new research on many occasions. Definitely not easy but there it is and, moreover, ... it is there.

One of the great privileges of befriending Prof. Oldeman for two decades perhaps lies with being there while his unrestricted view of forest was developed. An unrestricted view, as the term is used here, includes freedom from tutelage (see, e.g., Hecht and Cockburn, 1990, pp 219-221) and from mono-disciplinary views (see, e.g., Diamond, 1997). Almost *en passant* and certainly without intent, Prof. Oldeman introduced me to a wealth of knowledge on the nature and physics of information transport. This technology has direct practical implications for enhancement of audio equipment and the unobtrusive enhancement of the acoustics in large buildings; the latter being a rather shocking experience. Currently this leads to research of applications in the fields of biological- and biomedical- processes (Romeijn, unpublished).

Prof. Oldeman and his endearing wife, Mrs. W. Helder, have thus generously offered a continuous source of information and inspiration to all who would hear, and even to all those who would not. Modesty is the sign of a great man, and Prof. Oldeman has it in spades. This modesty shows in Prof. Oldeman’s conviction that he received his most moving compliment ever from a Wauwrani tribesman. The indian placed his hand on the Professor’s heart and simply said “wauwrani”, meaning ‘human being’. At the time, more than 20 years ago, there were only 500 Wauwrani left. This, together with the above, makes our dear Professor out to truly be *Roelof Oldeman, the grand old man of the forest.*

One final element remains to be mentioned, that of his fine sense of humor. Over the years we have shared so many good laughs, of which I introduced a single, tiny one in this document. I now leave it to the reader to find it ... Prof. Oldeman has long spotted it from a mile away.

And to our grand old man of the forest I exclaim: "Onward!"

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