Abstract

There are many ways to measure the accomplishments of a scientist, such as papers and books published, citations, and prestige of journals published in, but we rarely gather information that allows us to evaluate the variety of influences that individual scientists have on the careers of others. Dan H. Yaalon was one of the most accomplished pedologists of the 20th and early 21st centuries. In this paper we gather personal testimonials of the impact Yaalon had on scientists working in the areas of interest to Yaalon. This allows us to qualitatively evaluate the impact of an influential scientist on his field through the ways that he influenced the career choices of others. We found that this influence occurred through 1) personal, face-to-face contact, 2) written correspondence between Yaalon and other scientists, both through letters and through email, and 3) Yaalon’s written record itself, without any
direct, personal interaction between Yaalon and the other scientists. This influence took place over multiple generations of scientists, ranging from individuals who are currently retired to those who are just now in the very early stages of their scientific careers. The Yaalon example makes clear how successful scientists make significant contributions to their fields of interest well beyond those indicated by commonly used measures.

**Keywords:** pedology; paleosols; soil science history; aeolian processes; scientific contributions; scientific influence

1. Introduction

Dan Hardy Yaalon (1924-2014) (Figure 1) was one of the most accomplished pedologists of the 20th and early 21st centuries. Common measures of individual scientific accomplishment include numbers of papers and books written, prestige of journals published in, numbers of citations, and number and financial value of research grants received. By any of these measures Dan Yaalon was highly accomplished. He published over 200 articles and reports, many in leading international journals including *BioScience, Catena, Clay Minerals, Earth Sciences History, Geoderma, Global and Planetary Change, Journal of Arid Environments, Journal of Sedimentary Research, Journal of Sedimentary Petrology, Nature, Sedimentary Geology, Soil Science, and Soil Science Society of America Journal* (Yaalon, 2012). Yaalon’s work was highly respected and cited; according to Google Scholar ([http://scholar.google.com/](http://scholar.google.com/)) his works were cited thousands of times giving him an h-index of 38 and an i10-index of 91 (as of 4 July, 2015). Yaalon made significant contributions in several scientific fields, including soil science (particularly the science of pedology), geomorphology, paleosols (Figure 2), environmental reconstruction, and soil science history. Yaalon was a recipient of both the Dokuchaev Medal in 2010 (Itkin, 2014), recognizing major research accomplishments in soil science, and the Sarton
Medal from Ghent University in 2000 (Yaalon, 2000), recognizing excellence in research into the history of science. These awards demonstrate Yaalon’s transdisciplinary contributions. Yaalon himself felt that his greatest contributions were in the areas of the influence of dust on pedogenesis and the geomorphology of Israel (Yaalon, 2012).

While quantitative measures are appealing to those who think scientifically and are relatively easy to assemble, they have their strengths and weaknesses, and they hardly represent the full measure of Yaalon’s impact on his fields of interest. The ways in which Yaalon influenced other scientists are more difficult to quantify, yet can be appreciated in the “in memoriam” pieces written by colleagues and admirers following his death (e.g., Finck, 2014; Itkin, 2014; Richter et al., 2014; Rohdenburg, 2014).

Another approach to a non-quantitative evaluation of Yaalon’s influence was on display at the international symposium attended by more than 60 participants from 16 separate countries held in Yaalon’s honor in Vienna, Austria 8-11 April, 2015. In this paper we have collected testimonials from some of the attendees of that symposium representing multiple scientific generations and from wide geographic distribution. These testimonials provide information on how Yaalon influenced each scientist and allow us to qualitatively evaluate the variety of impacts Yaalon had as a highly influential and accomplished scientist.

2. Mentor of the Young - Eric C. Brevik

One of the subjects that has been an important part of my career is the history of soil science. I was introduced to this as a graduate student at Iowa State University when I took a class on soil genesis and survey. My professor (Thomas Fenton) assigned a term paper where each student in the class was to research a person who was important in the history of soil genesis and survey. I was assigned George Nelson Coffey, and I began my research by going to secondary sources. However, I rapidly learned that
while each of these secondary sources stated that Coffey had ideas on soil classification that were ahead of his time, they all had essentially the same three or four sentences of information and nothing more. To write a paper on Coffey I was going to have to delve into his primary works, which I set about doing.

By the time I completed my term paper I had far more information on Coffey than I had seen anywhere else, and I decided I should pursue publishing the work. After some revisions the manuscript was accepted by the *Soil Science Society of America Journal* (Brevik, 1999), making the paper on Coffey my third peer-reviewed article and my first soil science history article. However, publication of the article had been largely serendipitous; I didn’t have plans to pursue soil science history any further. Then, a few weeks after publication of the Coffey paper, a letter arrived from Dan Yaalon. I was a graduate student, unknown to almost anyone in the soil science community outside my own university, and I had a letter from Dan Yaalon! He complemented me on the Coffey paper, encouraged me to continue work in the area of soil science history, and going one step farther (a characteristic of Dan’s), he suggested another individual, Edward Elway Free, who had been ahead of his time but was largely ignored by the soil science community and deserved to have his history documented. My research on Free also became a published soil science history paper (Brevik, 2004), and I have now published a total of 21 articles to date that are historical or have soil history as a major portion of the paper.

I continued to carry on correspondence with Dan until shortly before his death and had one opportunity to meet him in person, at the 2000 Soil Science Society of America (SSSA) meetings in Minneapolis. Dan became a mentor, particularly in the area of soil science history. He continued to make opportunities available to me, doing things such as suggesting my name to editors who were looking for people to write on soil science history, including me as a co-convener in a World Congress of Soil Science symposium on soil science history, and reading materials I was working on to provide suggestions before
the manuscripts were submitted. My involvement in soil science history has also lead to many other
professional opportunities within the science of soils (e.g., Brevik and Burgess, 2013; Brevik et al., 2015a;
Brevik et al., 2015b) and Dan has continued to inspire soil history projects (Brevik et al., 2015c). I will
forever be grateful for the time Dan took to encourage a young graduate student he had yet to actually
meet.

3. My Time with a Giant - Dan Richter

I only met Dan Yaalon on the internet. I sent him a question in the early 2000s and quickly received a
thoughtful reply, a reply that also contained what I came to call “a Yaalon critique”! But in addition to
his critical stance, he always had a graciousness that invited me to follow up with new emails and I
began challenging my graduate students to write to Dan if they had questions about soils. I can only
imagine Yaalon's physical state in his latter years. He never got into details but I knew he was at least
having difficulties with walking. Yet, he was active at his desk with his many books, papers, and
computer. For me, this communication with Yaalon came at a time during which I was educating myself
in all aspects of the venerable science of pedology. I had worked to promote long-term soil experiments
for several decades, but I felt I needed to better connect field-plot experiments with their larger
systems. These conversations with Yaalon, in my opinion one of the greatest of all pedologists, were
central to my education.

During this time, Dan Yaalon wrote a proposal to create an International Union of Soil Sciences (IUSS)
Working Group (WG) on “Global Soil Change.” Unable to promote such a proposal on his own (he was
approaching 90), Yaalon sent the proposal to Dr. Ahmet Mermut (University of Saskatchewan) and me.
We felt pleased and humbled to lend our hands to Yaalon’s project. The WG was established, accepted
by IUSS, and a companion WG was formed in SSSA. We wrote a paper about the kind of future for soil
science the group envisioned (Richter et al., 2011), a forward-leaning paper we called “Human-soil relations are changing rapidly”. The paper had 30 co-authors from many generations, including a number of veteran scientists in addition to Yaalon. Whether or not these WGs have a future as currently constituted is not certain for they are passing to new leadership. Yet, the ideas in the 2011 statement are still very much on the table, many of them directly posed by Dan Yaalon.

By about 2010, I felt ready to write a pedological essay loosely patterned after a sweeping essay I had read as a graduate student, an essay on the state of the science in the 1960s written by Cornell’s long-standing Professor Marlon Cline, a piece he had entitled “The changing model of soil” (Cline, 1961). I thought it important to revisit Cline’s objectives fifty years after his summary publication. Yaalon remembered Marlon Cline well. We jointly re-read Cline’s essay and I proposed that we jointly write a new paper with three legs to stand on, three themes that would provide a balanced not overly complicated story line about on-going changes in the model of soil. Yaalon was quick and adamant about one of these changes and wrote something like, “since Dokuchaev, the most important change in the model of soil is the idea that most soils are formed by polygenesis and that they contain paleosolic features accumulated over their lifetimes.” He shared a 1980s paper of his on reconstructing past environments in which he had clearly made a similar point. In subsequent weeks and months, Yaalon would lead me into a body of literature that I was not yet familiar with, had not yet read, or had not read carefully, papers and books that were so exciting, interesting, and convincing that I became an adherent of soil polygenesis, soils as paleosols, and soil evolution. (In the great soils books of our time, by, for example, Schaetzl, Buol, Targulian, and others, one finds growing recognition for this fundamental and extremely important change in the model of soil).
My suggestion for the second of this three-legged manuscript was the transformation of Earth’s soils from natural to human-natural bodies and systems. Ironically, my support letter for Yaalon to be the Dokuchaev Prize winner (2010) had argued that Yaalon himself had been amongst the first to explicitly explore this soil transformation, which fundamentally alters the natural-body concept of soil. Yaalon’s paper with Bruno Yaron in 1966 was many decades ahead of its time in outlining how natural soil profiles were increasingly becoming the parent materials for human alteration. Our paper’s third leg was the extension of the depth of the soil profile, which was greeted by Yaalon with enthusiasm and had even been foreshadowed as a future change by Cline in his 1961 essay. At our paper’s end, which we entitled, “The Changing Model of Soil’ Revisited” (Richter and Yaalon, 2012), we combined the three changes to conclude that human forcings represented a global wave of soil polygenesis altering fluxes of matter and energy and transforming the thermodynamics of soils as potentially very deep systems.

During our many emails and the give and take of rewriting, the ever critical Yaalon had once threatened to resign his co-authorship, but in the end we hung together, and it was Yaalon’s special graciousness that he left in his wake. He sent me a copy of his autobiography, published in 2012, and in reading it I have never been so speechless as when I read the Epilogue. There verbatim is our Changing Model paper’s abstract, reprinted in full, along with a powerful statement that our paper represented, to Dan Yaalon, the culmination of his life’s work. I can only add that I wish that I am able to intellectually and spiritually touch my colleagues and students in some of the ways this great man had touched me.

4. From Maieutics to Soils – Eric Verrecchia

The first time I was on a field trip with Dan Yaalon, he took me to the kurkar outcrops (carbonate-cemented aeolianites) in Tel Dor, along the northern coast of Israel. “Do you see all the feldspars?” he asked me, holding out a handful of sand from the beach. Although I looked carefully, I could not really
identify many feldspars. In fact, most of the grains were quartz. “Slich (sorry in Hebrew), Dan, I don’t...” “Well, where do you think all the calcium for cementation is coming from?” It was in 1986, I was 25 years old, and I’m still working on the answer: the coupled calcium-carbon terrestrial cycle.

In 1985, I decided to start a PhD on calcrites in Israel. The obvious person to contact was Dan. I sent him a letter without really thinking he would take the time to answer a young French student, but he did, and very quickly. I still have his incredibly nice letter, written with a typewriter. He invited me to visit him and to see what innovations could be possible on this topic. The next summer, I flew to Israel and met Dan for the first time. He told me that he was giving a field course to postgraduate students and invited me to join them. We spent five fantastic days in the Carmel, Galilee, along the Sharon, looking at carbonate soils, paleosols, aeolianites, Vertisols, hamra (red sandy clay loam), and nazaz (red sandy soils with pseudogley). His teaching method was directly inspired from Socrates: maieutics. He did not give me answers, he just responded with other questions, pointing me in the right direction, stimulating me to seek explanations for myself. Of course, at the time, he already knew the importance of the contribution from dust to explain the cycles of elements in the soils of Israel, including along the coast.

Dan Yaalon was sort of a grumpy character, but in an amazingly endearing way. It was, I suppose, his way to show his respect. I asked him many times to write letters of recommendation and he always answered positively. In 1995, when I decided to send a paper to Biogeochemistry (Verrecchia and Dumont, 1996), dealing with a biogeochemical model that can be responsible for some carbonate hardening in Israel (in nari), he immediately supported me and acted as a remarkable reviewer. Although we were not in total agreement regarding the genesis of calcrete at Sde Boqer experimental site (Negev Desert), our discussions were always constructive and inspiring. There is no doubt that I am indebted to Dan for introducing me to the geology of Northern Israel, his advice for the choice of my
PhD site, and his never-ending intellectual stimulation, mostly during my frequent visits in Israel in the 1990’s. Dan Yaalon had the talent to bring out the best of yourself, a rare gift of great intellectual generosity.

5. Middle Eastern Connections – John Ryan

It is both an honor and a privilege to give a few brief reflections on the life of Dan Yaalon, a colossus in the field of soil science and related earth sciences. The passing of Dan in early 2014 marked a very sad year for pedology as it also coincided with the deaths of two other titans of our profession, Rudi Dudal and Hari Eswaran, both of whom I had known for many years.

I first came across the name of Dan Yaalon in the soils literature when I arrived in the Middle East to take up a position of assistant professor in the Faculty of Agriculture at the American University of Beirut in Beirut, Lebanon. As the only soil scientist in the Faculty, and one of the few in Lebanon, I was required to address most areas in soil science in addition to my own interest of soil fertility and plant nutrition. My expanded interests embraced the genesis, classification and management of the typical soils of the Middle East, especially the red Mediterranean soils typical of Israel and Lebanon. Most of the published research on such soils was from Israel, and it was in such reading that I encountered Dan Yaalon. It was clear to me that he was a leading authority on such soils, and I was later to learn that he addressed areas such as geomorphology and the history of soil science; indeed he was instrumental in promoting soil history as a sub-discipline in soil science (Landa and Brevik, 2015). In recognition to these latter endeavors, Warkentin (2006) made special acknowledgement of Dan Yaalon in his "Footprints in the Soil". Given my proximity in Lebanon to Dan in Israel, had circumstances been normal, I would have visited him. However, the sad political reality was that such a visit was not possible. Therefore, I could
only hope that one day I would meet this iconic figure in soil science. Such a meeting was to occur many
years after my 11 years in Lebanon.

Having moved to Aleppo, Syria with the International Center for Agricultural Research (ICARDA), my
international travels were less restrictive. I recall attending a lecture by him at the World Soils Congress
in Montpelier in 1998—a veritable tour de force, as were all his lectures. As members of the
Mediterranean Soils Network, we both attended the 1999 meeting in Barcelona. There, in addition to
hearing him in the formal sessions and on the field tour, I had the distinct pleasure of sitting next to him
and his charming wife at the banquet table. It was a memorable experience, and one of those evenings
that one always treasures; I felt that we had known each other for years. We shared our mutual
experiences of living in Israel and the Arab World. Though it was not possible for him to visit the
surrounding countries, Dan showed a keen interest in learning about life in the Arab World, and was
intrigued at the fact that I was living there for so long. Being the perceptive and open-minded person
that he was, Dan sought to have an objective perspective and see both sides of the tragic conflict that
plagues the region. Dan and I were one in our hope that Shalom and Salam would prevail, and that as
soil scientists our work would benefit the people of the whole region. The Mediterranean Soils Meeting
in Bari in 2001 provided another opportunity to further our friendship.

I met Dan again at the World Soils Congress in Bangkok (2002), where we had an enjoyable exchange.
However, I was sorry to note his difficulty in walking and need for a portable seat. I met him again at the
subsequent ASA meeting. However, despite his health problems, Dan displayed amazing fortitude and
strength of character in his pursuit of his lifelong professional interest in soils. Over the years of these
brief encounters, I came to appreciate his intellectual depth and breadth—and his extraordinary energy.
Along with professional awe and respect, I developed an affection for Dan as a cultured human being. In
the age of email, I was able to keep in touch with him in Israel, but not directly; I routed my emails to
Dan through our mutual friend Ahmet Mermut in Canada.

When Dan received the Dockuchaev Award from the IUSS, I thought it so fitting for such an outstanding
soil scientist who did so much for paleopedology, and indeed for championing the relevance of soil
science to society at large. While I was disappointed that Dan could not be present in Brisbane to accept
his award, I was pleased that his granddaughter did the honors for him. I would have loved to share a
picture with him on that occasion. However, I did write Dan to give my impression of the Award
ceremony and to congratulate him on this distinction. I even went further and told him of my deep
respect for his professional achievements and how I valued him as a role model and friend. Dan was
most gracious in his response, and amusingly said what I had written was something that is normally
penned posthumously, but admitted that he was glad to be alive to read such words. Unfortunately, I
was never able to visit him in Israel or see him again. Shortly, my own world was to collapse, and the
region engulfed in a downward spiral of conflict and tragedy. I take inspiration from Dan Yaalon in not
losing hope in a better tomorrow no matter how bad things are today. Despite the vicissitudes and
trauma of his life, Dan Yaalon never gave up.

I was delighted to honor the memory of Dan Yaalon by attending the Memorial Symposium in Vienna. It
brought home to me how uniquely privileged I was to know such a great soil scientist and a sterling
human being who is an inspiration for all of us.

6. A Connection Between Mediterranean Pedologists - Rosa M. Poch

As a soil scientist working mainly on soils formed under a Mediterranean climate, I have invariably been
in contact with Dan Yaalon’s works since the beginning of my scientific career. In addition, my focus has
been the study of soil genesis using mainly micromorphology, and I must admit that reading Yaalon’s
depth. Some years after I was pleased to read Yaalon’s
findings about displacive crystallization of gypsum in desert soils (Amit et al., 1993; Amit and Yaalon,
1996). Afterwards, my research on calcareous soils and paleosols, mainly with recarbonated argillic
horizons, was very much clarified by the excellent paper on Mediterranean Soils (Yaalon, 1997) and by
his works with Moshe Wieder (Wieder and Yaalon 1974; 1982). In the last few years I discovered
Mediterranean loess, and again I found very explanatory papers on desert loess and its characteristics
that make it distinct from “temperate” loess in Yaalon (1969), Yaalon and Ganor (1973), Yaalon and Dan
(1974) and Yaalon (1987). Therefore, in spite of the fact that I never met Dan Yaalon, I have been and
continue to be helped and supported by him when studying the soils of my natural environment.

7. Soil Geomorphology in Israel - Onn Crouvi

When I started my undergraduate studies in the Institute of Earth Sciences at The Hebrew University of
Jerusalem in 1995, Dan Yaalon had already been retired for several years. Thus, I never had the
opportunity to take one of his classes. I would see Dan at the Institute library as he was browsing
through the latest journal volumes, and it impressed me that a retired professor was so eager to stay on
top of the latest research developments.

I developed a more personal connection with Dan about a year later. During a geological mapping
course that was held in the Judean Mountains, each group of 2-3 students conducted a small research
project based on the groups’ field findings. My colleagues and I chose to work on ‘Nari’, the calcrete
mantling chalk-rich formations in the mapping area. Naturally, Dan was our advisor for this project, since he had studied the development of calcrites during the 1970s. Although he did not join us in the field, I remember the many intellectually inspiring, yet demanding research discussions I had with him. Dan’s guidance really played a critical role in my first independent research experience, having a profound influence on the direction of my career.

In 2001, Dan received an Honor medal from the Israel Geological Society for his remarkable contributions to surficial geology and geomorphology; it was not trivial for a pedologist to receive a medal from the geological community. The award was presented by Rivka Amit (then president of the society, as well as one of Dan’s academic successors in soil-geomorphology research) during the society’s annual meeting. In his acceptance speech, Dan gave a short overview of his career, highlighting important aspects of his achievements. As a young M.Sc. student in the field of soil-geomorphology, I listened carefully to his speech. One segment that left an unforgettable imprint on my memory was his recounting of how, in the 1960’s and ’70’s, leading members of the scientific community opposed his findings that loess can be formed through non-glacial processes, and that dust contributed significantly to the development of soils in the Middle East. It is worth mentioning that these conclusions have since been corroborated by numerous studies and now represent the consensus opinion. In his speech, Dan was specifically addressing the students in the audience, stressing the importance of standing behind one’s conclusions, even if contradictory to the leading paradigm. This message was particularly apropos when, during my closely-related doctoral research, I reached a conclusion not in alignment with conventional thinking. I concluded that the major sources of desert loess worldwide are the adjacent, upwind sand dunes, from which silt grains were produced by eolian abrasion of sand grains.
The last time I met Dan was in 2008, when he attended my Ph.D. defense presentation at the Institute of Earth Sciences. I felt honored by his presence, because at that time he rarely visited the University due to his difficulty walking. It seemed that he was very pleased to see that the field of soil-geomorphology had become so active at Israeli universities and research institutes, where his legacy remains to this day.

8. Great Character and Inspiring Thinker – Daniela Sauer

When I think about Dan Yaalon, two characteristics of him, great character and inspiring thinker, spontaneously come to mind. We never met personally, but he continuously followed the activities of the IUSS Commission on Palaeopedology through the Palaeopedology Google Group and e-mail, and since I became the Chair of the Palaeopedology Commission in 2010, he always supported me in my work for the Commission. He never missed a chance to send his warmest regards to me through his last PhD student, Danny Itkin, when he knew that Danny would see me. I feel particularly grateful for his honest, steady support and his heartiness because I know what incredible evil Dan Yaalon and his family had experienced from Germans in his young life. He was able not to project these experiences on the next generations, not only by rationality but also by heart.

Secondly, of course, Dan Yaalon definitely inspired me – like numerous others – in my thinking and ideas about soil formation. I have been working a lot on soil formation, studying soil chronosequences in various regions of the world. Especially, in the last years, I felt more and more that soil chronosequence data are often interpreted in a too straight-forward way, and that we need to consider more carefully existing pedological concepts – and develop them further (Sauer, 2015). Dan Yaalon had pointed out already in 1975 that any functional relationships “must be consistent with or related to the existing body of scientific laws” (Yaalon, 1975). Although this point seems to be self-evident, it is not always taken into
account when soil formation over time is described by fitting soil chronofunctions to the observed
changes.

Other basic concepts of Dan Yaalon that were most influential to me include:

- Yaalon's categorisation of soil properties according to the time-span required for their adjustment to
  the actual environment into (i) rapidly adjusting, (ii) slowly adjusting, and (iii) persistent soil
  properties (Yaalon, 1971);
- feedback systems in soil formation: Yaalon (1983) among others pointed to the existence of feedback
  systems in soil formation, which slowly change internal processes with time;
- the polygenetic character of most soils as discussed by Richter and Yaalon (2012);
- characteristics of Mediterranean soils and the role of dust (Yaalon and Ganor, 1973; Yaalon, 1987,
  1997).

These concepts all have fundamental implications for studying both soil chronosequences and
palaeosols.


In 2011 I was finishing my PhD thesis and just a few months before my public defense I realized that my
first important scientific project was ending and I should start looking for a new subject. I asked myself
where and what kind of challenging topic I should look for? One part of the answer came with the WRB
Workshop and Excursion that took place in Poland (2011). I was involved in the organization of the field
trip. During the preparation of soil profiles we evidenced silt-rich mantles, with different thicknesses,
over granite and serpentinite saprolites. Also later on, when I worked together with geologists (Jakub
Kierczak and Artur Pędziwiatr) from the University of Wroclaw on the mobility of Cr and Ni in serpentine
soils, I noted a similar configuration of silt material and residuum substrates. These profiles revealed a
distinct record of the influence of past aeolian activity on the soils of Lower Silesia. In our discussions my
former supervisor (Cezary Kabała) encouraged me to go a few steps further and develop a scientific
project based on such examples. However, neither the stratigraphy of loess nor dust input to soils were
my main scientific interests during my master's and PhD studies. I did not have an overall concept of
how to collate all the examined soil profiles and prepare a proposal.

A breakthrough came when I found three publications written by Dan Yaalon (Yaalon and Ganor, 1973;
Yaalon, 1975; Yaalon, 1987). These helped me to better understand the role of aeolian silt sediments in
soil formation. The earliest of these articles, related to the evaluation of the influence of dust on soils
(Yaalon and Ganor, 1973), turned out to be the most important. This paper shows the conceptual model
of a soil continuum that displaces different stages of aeolian influence and fits very well with the
pedological situation of the Silesia region - this is it, I thought, as I started working on the project! In the
following months I built a hypothetical model for aeolian silt influenced soils in Lower Silesia. Of course, I
realize that many other scientists have been inspired by Dan Yaalon's publications and the ideas they
contain, e.g. Karathanasis and Macneal (1994) and Muhs et al. (2010). However, in my case this
inspiration was twofold: first of all, the dust-soil continuum presented by Yaalon changed my general
view on the impact of aeolian silt on soils; and second, the articles helped me ultimately choose my
main field of study and its objectives.

Eventually, I wrote a proposal inspired by Dan Yaalon's publication, entitled “Verification of parent
material homogeneity in soils developed from crystalline and sedimentary rocks in the loess-influenced
territory of the Lower Silesia region”. This project was successfully accepted for funding by the National
Science Center in Poland and has become my habilitation grant. Over the next three years, I will try to
determine: (1) the criteria for allochtonous and residual materials differentiation in geologically variable
environments; (2) the age and duration of the formation of subsequent soil genetic horizons/layers; (3) the stratigraphic markers for spatial distinction of aeolian and non-aeolian substrates; and (4) the approximate southern margin of aeolian silt input recorded in soils of south-western Poland.

Unfortunately, I never had a chance to meet Dan Yaalon in person. Yet, my work on the subject of aeolian input in soils and expanding knowledge regarding the soils of Lower Silesia is surely the best way to thank him for his remarkable inspiration!

10. A Touch of Knowledge – Elizabeth Solleiro

Since I began my studies of soil genesis, I have read Dan Yaalon’s papers. I liked the way he communicated, as he was able to translate in simple words the complex models of pedogenetic processes. I met Dan Yaalon during the World Congress of Soil Science held in Mexico, in 1994. I was studying my PhD, working on paleopedology. We had no specialists in this research area in Mexico. Thus, I attended the conference and went to a session organized by Dan. I was very impressed with his personality. When the session finished, I approached him and asked for some recommendations in my research project. With a big smile, he talked to me, recommended some papers, and gave some advice to use paleosols as a proxy for the paleoenvironmental reconstruction. I was touched by his words pushing me to go farther, in a topic that was then completely new in Mexico.

Some years later, in 2003, I started to work with soils developed on limestones in Yucatan, in a karstic environment. The complexity of soil distribution, going from the thin black Rendzinas, to outcrops of limestone, to soils and pedosediments inside karstic pockets, and finally to the thick, red, clayey soils, made me search for the classic works on Terra Rossa. That was when I read Yaalon’s papers on Red...
Mediterranean Soils (Yaalon, 1987; 1997). Once again, I was touched by the ideas he proposed, which were used partially to explain the genesis of soils in Yucatan.

Although my relationship with Dan Yaalon was short, the knowledge and inspiration he transmitted to me was very stimulating in my scientific career.

11. A Scientist That Kept Working – Curtis Monger

Dan Yaalon’s influence on my career began when I was a graduate student at New Mexico State University in the mid-1980s. He was a member of the International Commission on Aridisols (ICOMID) group that came to Las Cruces, New Mexico in 1987 to tour the Desert Soil-Geomorphology Project on their way across the arid southwest from Texas to California (Figure 3).

The following summer I attended the 1988 IUSS Micromorphology meeting in San Antonio hosted by Larry Wilding and his colleagues at Texas A&M University. Dan Yaalon was an outspoken leader at that meeting, including the debate about whether micromorphology is a science or a technique. Dan argued persuasively that it’s both. One day I got up enough nerve to join him in the walk between the cafeteria and the auditorium and brought up the topic of dust as a source of pedogenic carbonate. He, of course, was a strong advocate of the dust hypothesis, which would become fundamental for explaining carbonates in the Southwestern USA. Lee Gile had long viewed Yaalon as an ally on this subject. From a micromorphology point of view, the paper by Wieder and Yaalon (1974) was important for my research because it clearly laid out the logic for understanding whether a nodule had formed in situ or was detrital based on its silicate mineralogy.
I saw Dan later that year at the SSSA Meeting in Anaheim where he was an invited speaker on pedogenic carbonates. He said that previously he did not think microorganisms precipitated pedogenic carbonate, but given recent evidence in Spain, he had changed his mind. To me, a graduate student, that was very influential, and I now think the ability to change one’s mind in light of new evidence is the signature of a great scientist. Also from his presentation I got the idea to conduct a lab experiment to determine if microorganisms in New Mexico soils could precipitate pedogenic carbonate—they did (Monger et al. 1991).

In 1993, now an assistant professor, I attended a Paleosol symposium hosted by Leon Follmer and Don Johnson at the Allerton House, University of Illinois. Dan wasn’t the elder statesman at that meeting because Roger Morrison was there, but he was a close second. The major debate at this meeting was how deep and how old does a buried soil have to be before it can be considered a paleosol? And what if an ancient soil was never buried? Dan’s concepts in Yaalon (1971) of “slowly adjusting” and “reversible properties” provided a framework for this debate (both relict and buried paleosols). Still, no consensus was reached.

The next time I saw Dan was at the Argentinian Soil Science Society in Santa Rosa in 1996. During my talk I showed a thin section followed by a satellite image. Dan told me afterwards that I had lost the audience by making such a leap in scale. I wouldn’t have known that if he hadn’t bothered to tell me.

Carbon sequestration had become a hot topic by 1997 when I next saw Dan at the “Pedogenic Carbonate and Global Climate Change” conference in Tunisia organized by Rattan Lal, John Kimble, and their Tunisian colleagues. The field trips were excellent. I particularly remember how honored and carefully a couple of Muslim graduate students helped Dan into and out of soil pits on a steep slope.
Although I corresponded thru email with Dan until February 2013, the last time I saw him was in 2002 at the World Congress of Soil Science in Thailand. Riding in a cab from the hotel to the conference I asked Dan how he had managed to accomplish so much. He said: “I just kept working.”

12. No Soils for Geologists – Franz Ottner

Unfortunately I never met Dan Yaalon personally, but quite early I realized there was a great elderly man in Israel who published a lot of interesting papers on soils, and for me was influential for drawing together geology and soils.

During my studies of geology at the University of Vienna no lecture about soils or paleosols existed in the entire curriculum. Generations of geologists were involved in solving the secrets of genesis and structure of the Alps. There were intense discussions about the rocks down to 30,000 meters depth, but the uppermost meter of the more or less altered rock was not of interest. However, the history of geology and mineralogy was of great interest, so I came across Dan Yaalon because of his work on the history of soils.

The situation changed when I started my PhD work at BOKU. The main topic was the mineralogy of clays for engineering use. The gap between geology, clays, and soil became small, and soil mineralogy was of great interest.

Studying the stratigraphy and sedimentology of Austria and the surrounding countries, very often I found indications of former landscapes. Therefore my first paleosols were found or recognized and from
this time on paleopedology played a major role in my research. To explore paleopedology means to get in contact with the work of Gregory Retallack and Dan Yaalon.

Most clays and soils contain a lot of iron oxides and hydroxides and soon I had the opportunity to meet with Arieh Singer from Israel. I got a personal copy of his book “The Soils of Israel” and of course I came again across Dan Yaalon’s work.

For my future scientific work and teaching of Earth sciences, the Dan Yaalon Symposium provided an essential impact. The personal contact with Yaalon’s family, friends and colleagues was highly impressive. Particularly during the visit to Dan Yaalon’s birthplace, Uherske Hradiste, I could feel the spirit of the great scientist and human being, who influenced my scientific work so significantly. It is my ambition to change the rule in Austria from “no soils for geologists” to “soils are an important and exciting part of geology”.

13. Dan Yaalon – an outstanding pedologist developing Dokuchaev’s paradigm – Victor Targulian

The first time I heard Yaalon’s name was in the 1970s when I read his famous article “Soil-forming processes in time and space” published in the book “Paleopedology” (Yaalon, 1971), based on his talk at the first conference of paleopedology in Amsterdam. This article impressed me very much because of its close adjacency to the Russian approach to the problem of soil behavior in time and space. I thought of him as a “friend of spirit” in this problem.

I met Dan personally, face-to-face at the World Soil Science Congress in Edmonton, Canada, in 1978 where he gave me a great compliment while speaking to a small party of Canadian soil scientists. “A-ha, this is the young Russian soil science star” he exclaimed playfully. He mentioned the publication of my
book “Soil Formation and Weathering in Cold Humid Areas” (Targulian, 1971). I was simultaneously strongly confused and very proud by these words: Dan was ten years older than me and had already achieved wide recognition as a pedologist.

From this time I started to read many of Dan’s articles and widely promoted his work among my Russian colleagues. It was not easy: it was the time of the Cold War and there were no diplomatic relations between the USSR and Israel. However, we met many times at World Soil Congresses: in Germany, Japan, Thailand, Mexico, France, etc. Fortunately, after “perestroika” our Russian Dokuchaev Soil Science Society had a chance to invite Dan to visit Russia to participate in some international conferences and once even in the USSR National Soil Science Congress, where he was elected as an Honorary Member of the Russian Soil Science Society.

Dan’s work, and in particular, his evolutionary concepts of soil development, his approach to the assessment of fast and slow soil processes interaction during pedogenesis, and his enthusiastic propagation of the paleopedological approach to the understanding and use of present-day exposed contemporary soils very deeply affected pedology and paleopedology both in Russia and throughout the entire world. Dan Yaalon’s creative work is one of the best examples of the profound impact of the genetic Dokuchaev-Jenny pedological approach and will help scientists worldwide better understand soil genesis and to better forecast soil behavior in the future.

14. Conclusions

Dan Yaalon was a major advocate for the study and documentation of the history, philosophy, and sociology of our field (Landa and Brevik, 2015). Dan once told E. Brevik “History is made by people - not anonymous efforts or events” (written communication, 19 August 2011). Dan’s point was that it is
important for us to document the accomplishments of individuals who have done the work that advances science and not only the scientific advance itself; without the people, there are no advances. This was a principle that Dan firmly adhered to.

In this paper several individuals have told how Dan influenced them, something that was a major accomplishment of Dan’s. In some cases that accomplishment took place within a close working relationship, physically being in the classroom, field, or laboratory with Dan. In other cases that influence came mainly through periodic contact at professional meetings or by correspondence, either postal mail or email (Figure 4). And in still other cases it was indirect, through Dan’s writings without direct interaction. This influence took place across multiple generations of scientists, including those who today are retired, in mid-career, and just beginning their careers. But in all cases Dan, the individual, touched each of us and, hopefully, helped sustain us in our contributions to our various fields of study, demonstrating that a successful scientist makes significant contributions to their fields not only through their papers and books but also through their influence on others. It is the hope of the authors of this paper that Dan would have appreciated and been proud of the effort made here to document individual accomplishments through personal impacts of one of the people who made major contributions to the science of his day.

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Figure Captions

Figure 1. Dan H. Yaalon (left) and Yaalon holding a picture of himself as a child (right). Left photograph courtesy of Uri Yaalon, right photograph courtesy of Rachael Cerrotti (http://www.rachaelcerrotti.com).

Figure 2. Dan Yaalon describing a paleosol. Photo courtesy of Danny Itkin.

Figure 3. Members of the International Commission on Aridisols (ICOMID) at the Upper Las Mesa site near Las Cruces, New Mexico in 1987. From left to right: Larry Wilding, Dan Yaalon, Leland Gile, René Tavernier, Bill Johnson, Wim Sombroek, and B.L. Allen. Photo courtesy of Curtis Monger.

Figure 4. Even after retirement, Dan Yaalon worked from his home office to keep up with the latest developments in his fields of interest, publish papers, and maintain contacts with other scientists from around the world. Photo courtesy of Uri Yaalon.
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