

## Hutchinson's tree

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Skimming through one of Stephen Jay Gould's delightful books, "Dinosaurs in a Haystack", I came across the name of George Evelyn Hutchinson, last century's great pioneer of ecology and biogeochemistry. Gould's essay, entitled "A Special Fondness for Beetles" (Gould, 1995), cites, from one of Hutchinson's papers, the following paragraph: "There is a story, perhaps apocryphal, of the distinguished British biologist, J.B.S. Haldane, who found himself in the company of a group of theologians. On being asked what one could conclude as to the nature of the Creator from a study of his creation, Haldane is said to have answered, *An inordinate fondness for beetles!*". Gould goes on to define Hutchinson as: "the world's greatest ecologist and the only twenty century British biologist who could match J.B.S. Haldane in brilliance and wit".

I then stumbled in another essay by Gould, "Exultation and Explanation" (Gould, 1987), entirely dedicated to Hutchinson: "Hutchinson is as legendary for his kindness as for his brilliant mind". These statements were confirmed and reinforced in a biography of Hutchinson written in 2010 by Nancy G. Slack (Slack, 2010). In his presentation of this book Edward O. Wilson, the creator of Sociobiology, wrote that Hutchinson was "one of the few scientists who could unabashedly be called a genius".

So I am pressed to go back over half a century ago, to a day in November 1959, at Yale University, New Haven, Connecticut. I am going to meet Professor Hutchinson. I am climbing up the stairs to the first floor of the Osborne Zoological Laboratories, a brown-stone, heavy Victorian building. I carry on my left shoulder a very heavy load, a

bundle of one and half meters long tightly sealed aluminium tubes. They contain mud, very precious mud indeed: sediments from Monterosi, a small lake from central Italy, which I am going to study at Yale with professor Hutchinson. I just arrived in America. I am 23 years old. I never met Hutchinson.

A wide long darkish corridor, ancient cabinets with biological specimen in display along the walls, and a row of dark brown doors, the professors' offices. I find the room of Professor Hutchinson. I knock... my heart beats fast...

The story had started a couple of years before, when, during one of the lectures of the regular geology course at the University of Pisa, the Professor, Livio Trevisan, announced to the 20 or so young men (no women were then enrolled in geology!) that a famous scientist, G.E. Hutchinson, was willing to host for one year at Yale University in the US an Italian student to study sediments from volcanic lakes of central Italy. "Is any of you interested?" I raised my hand before he even finished his sentence! Yes I was interested!... I looked around: no other hand was raised, all arms were resting comfortably on their respective desks: my fellow students were not eager to abandon the tasty evening soup of their mammas and the sweet lips of their girlfriends in the park benches of Pisa... The main reason for my choice was that it would allow me to run away from Italy in search of "adventure". So it happened that for my master's thesis I studied sediments from a crateric lake of central Italy, specifically from Baccano, a dried lake from the Sabatini Pleistocene volcanic district north of Roma. This would prepare me for the work I was going to do at Yale with Professor Hutchinson.

As soon as I completed my degree, together with W.T. Edmonson and his wife Yvette, both paleolimnologists pupils of Hutchinson, we managed to collect sediment cores from Monterosi, a small crateric lake located about 50 Km north of Rome: I were to study these sediments at Yale with Professor Hutchinson. Before taking off for this adventure I spent a week at the Istituto di Idrobiologia in Verbania Pallanza (Lago Maggiore). The Directors, Vittorio and Livia Tonolli, friends of Hutchinson, stressed how lucky and privileged I was in going to work with him. A Fulbright fellowship paid for a third-class ticket in a Naples-New York passenger ship. After a 13 days At-

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lantic crossing, I managed in the chaos of New York 42<sup>nd</sup> street pier to convince the Customs officers not to open the aluminium tubes with the Monterosi sediment cores. Then by train to New Haven, where I was taken in by a "host family".

Now I was knocking at the office of prof. Hutchinson, with the heart beating fast and the aluminium tubes still pressing on my shoulder. A small darkish room cluttered with books and papers scattered all around. Here is Hutchinson with his hooded serene light blue eyes, grey white unkept hair, a good fatherly face, but a deep hoarse voice with a British-Cambridge accent that I had trouble understanding (Fig. 1).

I stayed there 10 months, in a large room adjacent to Hutchinson's, studying the sediments extruded from the aluminium tubes, doing some chemistry but mostly sitting at a microscope... sometimes Hutchinson would drop by, look over my shoulder, always encouraging and reassuring. He knew some Italian, as a young man he had spent one year at Naples' Zoological Station. But outside of the work setting we had no contacts. I was then surprised when one day in the Spring he invited me to a concert given in his home by his wife. "*Oh, with pleasure, I did not know your wife is a musician...*" ... "*Yes, she is a lyrical singer...*"



**Fig. 1.** George Evelyn Hutchinson, from Yale Alumni Magazine, 1955.

On the appointed day and time, I rang at Hutchinson's home wearing jacket and tie. He opened... we were in a large well furnished living room... a young man was already sitting at a piano. I was made to sit in a comfortable armchair next to Hutchinson. Nobody else was there. The side of the room facing us was covered with a curtain. The curtain opened and a tall middle age, grey hair lady appeared wearing a formal evening dress down to her feet. Hutchinson clapped, I did the same. She bowed. Then she signalled at the young pianist. The concert started. She never looked down at her scant audience. Her eyes were fixed on to unknown far away horizons while she sang with great passion... I think they were mostly lieder by Schubert. Hutchinson and I clapped after each piece; she bowed deeply each time, then disappeared behind the curtain and appeared again for the next piece. After about the tenth piece Mrs. Hutchinson was not coming out again from behind the curtain. Hutchinson kept clapping... I followed him... Mrs. Hutchinson appeared again... she sang a last piece as an encore... she disappeared again. Hutchinson got up, the concert was over. The pianist left, I with him. This was the only puzzling glimpse I had of Hutchinson outside the Laboratory.

As the Summer was approaching, my work on the sediment cores from the lake of Monterosi was nearing completion. At first I had not understood why Hutchinson had selected a small, apparently insignificant lake for an in depth, multidisciplinary study. Monterosi is located 50 km north of Rome, along the "via Cassia", one of the classical roads built by the Romans. It occupies a 500-600 m diameter crater of the Sabatini volcanic system, active in central Italy up to roughly 30,000 years ago. Paleolimnology as a discipline was really "invented" at Yale by Hutchinson and his pupil E.S. Deveyey. Monterosi is an example of Hutchinson's broad, all encompassing approach to science. C-14 datations of the sediments cores I had transported to Yale indicated that the lake's history ranged from 25,000 years ago to present; thus, Hutchinson's intuition in choosing this small lake proved right, because the study of Monterosi's sediment cores unravelled not only the chemical and biological evolution of a small fresh water basin, but also a 25,000 years (including the last Ice Age) history of climate and vegetation in central Italy. It revealed that southern Europe from 25,000 to about 15,000 years ago was a cold, arid steppe environment, consistent with the idea of an arid climate for the northern Mediterranean region during the last Ice Age. The Monterosi cores also shed light on archaeological and historical events, such as deforestation linked to the opening of the Cassia Road by the Romans, and reforestation due to the abandonment of the area during the Middle Ages. An entire issue of the *Transactions of the American Philosophical Society*, edited by Hutchinson (Hutchinson, 1970), was dedicated to studies of lake Monterosi. I did

publish in Nature a paper (Bonatti, 1996), based on the Monterosi results, suggesting that the climate of the temperate regions of southern Europe had been arid during the Pleistocene glaciations, contrary to the prevalent idea of “pluvials” during Ice Ages.

Hutchinson asked me to stay on for another year. I thanked him but I wanted to move on... I was too young and naïve to realize that a small lake can be as large as a large ocean. He must have written a good letter on my behalf, because when I applied to the Scripps Institution of Oceanography of the University of California, they accepted me.

Over 20 years later the Yale Geology Department invited me to give a lecture. While I was lecturing in the crowded hall, I had a glimpse of an old white-haired man on a wheel chair on the side of the lecture hall. It was Hutchinson. When at the end of the talk I rushed to greet him, he did not say anything, but his warm blue eyes were smiling at me. He died a few years later, in 1991.

The year I spent at Yale with Hutchinson went by as if in a foggy reverie... It was my first year in America... I

was quite disoriented. I did not realize the extent of Hutchinson stature as a scientist... My background was in geology-petrology more than in biology or in ecology: actually, ecology was just starting as a discipline, and Hutchinson was one of its pioneers. He had arranged for Vladimir Vernadsky’s “The Biosphere” to be translated in English, so that the ideas of the great Russian geoscientist could be known in the west. Vernadsky was a member of that Russian pre-revolutionary “intelligentsia” that included Mendelejev and others. Their “Holistic” approach led them to develop the basis of modern ecology.

I was not aware that in 1959, the same year of my arrival at Yale, Hutchinson had published a seminal paper, “Homage to Santa Rosalia, or Why are there so Many Kinds of Animals” (Hutchinson, 1959). In that paper Hutchinson narrated how on a visit to the sanctuary of Santa Rosalia on Monte Pellegrino overlooking Palermo, he found in a water pond two different species of water bugs of the genus *Corixa*. He asked himself why the pond hosted 2 rather than 20 or 200 species of that genus, and he then speculated on the more general question as to

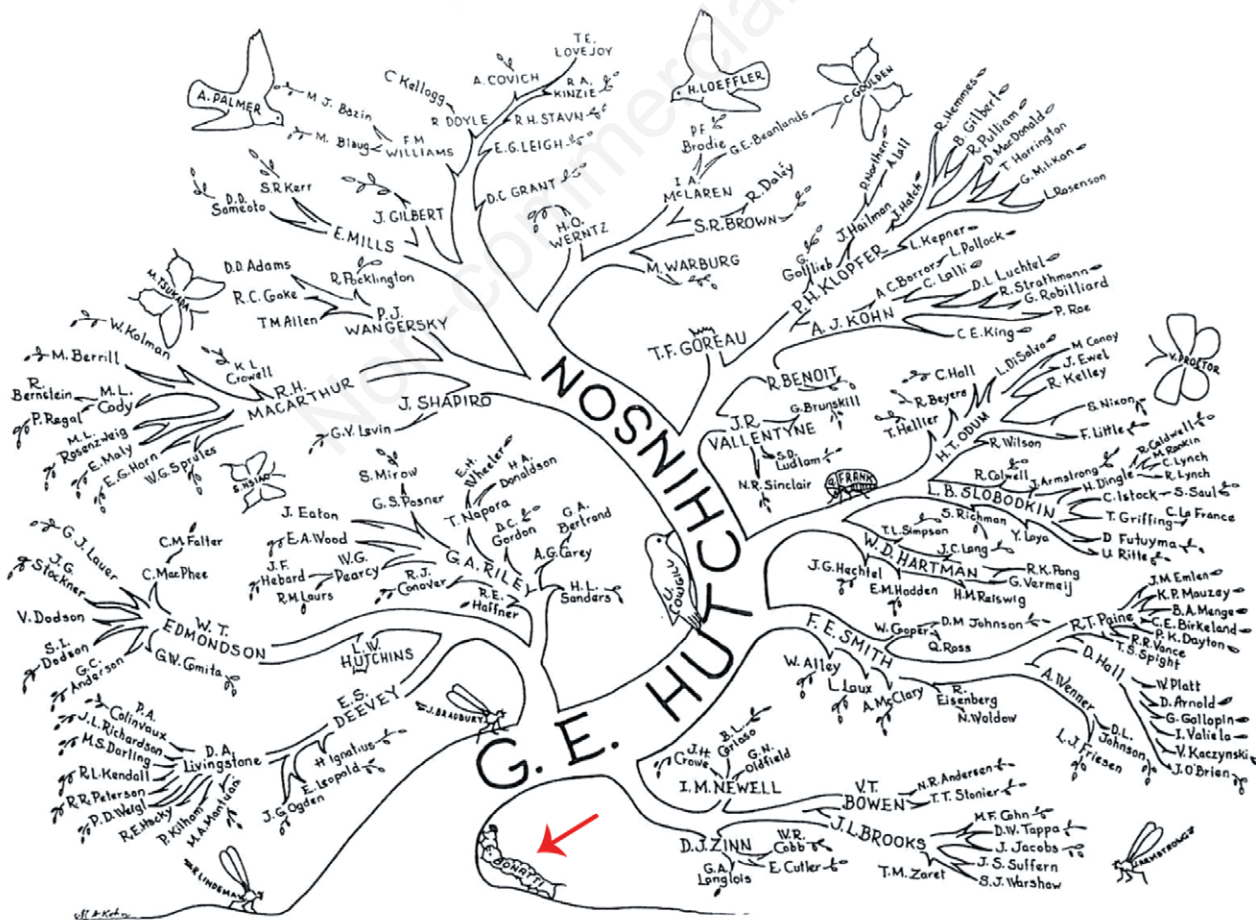


Fig. 2. Hutchinson’s tree. From: Edmondson YH, 1971. Limnol. Oceanogr. 16:157-163.

“why is there such an enormous number of animal species?”. A typical approach: from a few Sicilian bugs the paper goes on to discuss one of the major problems of modern biology. Half a century ago Hutchinson was already discussing biodiversity and in the nineteen fifties he was already speaking of anthropogenic CO<sub>2</sub> warming up our Planet, a subject so important today.

A 1971 issue of the journal *Limnology and Oceanography* (Edmondson, 1971) was dedicated to Hutchinson in occasion of his retirement from Yale. The journal published the illustration of a tree (Fig. 2), representing Hutchinson, where each branch, each leaf, as well as little birds and butterflies perched on the tree's branches, all represent his pupils and former students, some of them today well-known scientists. When I first skimmed through this drawing and did not see my name on the tree, I did not mind, since my connection with Hutchinson was limited to one year... but then recently I bumped again into Hutchinson's tree, and I noticed something I had missed before: crawling all alone on the tree roots there was a caterpillar bearing my name...!!

Worm or butterfly, I am happy and proud to have a little spot on Hutchinson's tree!

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