

DULIAbio 2019

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HOW I GOT THE IDEA OF GROWING CELLS IN THE ENVIRONMENT OF THE GRAN SASSO LABORATORY (LNGS)

Invited speaker Prof. Luigi Satta

The Advisory Committee asked me to give a short talk to explain the reason why I, born and grown up as a physicist, ended my scientific career as a biophysicist. I think, and there are many examples (see, for instance Luria and Delbruck) that a transition from physics to molecular biophysics may happen whenever the research topics can be treated in parallel.

Let me begin with the situation in about 1995. At that time the construction of the underground laboratory had just begun, and we were following the miners who at that time excavated the three huge experimental halls of the LNGS. The order was: first to burst the mines to open the rock. Second the excavator to clean the residues of the explosion. Last came the physicist, a small group, equipped with a small detector (about 1 square meter) sensitive to single particles. Without going into details, we could measure the underground radiation field, together with the external field.

I was struck by these numbers, the external field being substantially higher than the internal one. I stored the measured numbers in a memory in my brain and forgot even its location. All efforts were dedicated to the construction of the main experiment (we realized a portrait of the "big physics" even with the cosmic rays). It took another long period of hard work to begin data-taking. Again, without going into details, in the following period of several years we collected a lot of physics (for example the angular distribution of the cosmic-neutrino or the primary spectrum composition).

Now I have to comment on the transformation of myself from a particles physicist, may be a little bit presumptuous, to a not too well elevated biologist. As far as I can remember, at the end of the data-taking with the large detector, I had already made the transition and was interested in the relation of living matter with the background radiation. All I needed was a little money (there was never a real problem with money) and a few biologists who appreciated my imagination. The theoretical support came from the charming book of G. Stent and R. Calendar "*Molecular Genetics*". I was lucky to find the right group and to work with them happily.

As a final remark, the mixed group (biophysicists) had two names:

1. **PULEX** (meaning flea in latin),
2. The **COSMIC SILENCE** (proposed by N. Zichichi during a visit to the Laboratory).

Both names are suited to my switching to biology from physics, the first one indicating the smallness of the biology experiments with respect to those of physics, while the second name is more romantic in the description of what we effectively found.

Before closing I would like to show you how rapidly the underground physics diffused among the "mixed population". Unfortunately when I try to evaluate the number, possibly not meaningfully, you find that from your apartment you cannot reach many libraries.

I can say only what perhaps gives a meaningful idea of what happens.

- a) We did work with the V79 cell, until Antonella (Tabocchini) had the happy idea:
- b) Substitute V79 with the simplest (I believe) multicellular being: *Drosophila melanogaster*.