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# Thoughts to younger colleagues from a retiree

In late winter in Sweden 2022, I accepted an invitation to share some thoughts with younger colleagues. – Here they are. Almost everyone that happen to read them, is younger than me, so the title is all inclusive. It is not my intention to give advice, you walk along your own path. Perhaps I can highlight some experiences from my own life that may help you avoid traps that I fell into or almost.

## Choices in life

In my high school age, I was interested in engineering, mathematics and physics. At the same time, a good teacher of natural sciences made them quite attractive to me, too. Since students entering medical school had some advantages in military service, I chose to start that way. The studies turned out to catch my interest and soon I found that this was my way. My reflection is, that the process of making choices in life are often led by the general goal (vision) and, if only well defined, it can eventually also be reached! Important to know for young people. On the way through life, irrational circumstances will influence the fine tuning of next steps, but the goal remains.

## New circumstances influence the choice of direction of route, a privilege for a free person

During my studies in pharmacology, I accepted an offer to work as junior lecturer at the institution. There, by chance, I met a 3-year-older colleague (Jan Ekstedt) pondering upon a topic for his thesis. After several discussions, we jointly accepted our professor's proposal to study fatigue in relation to pharmacology. This led us, after a long journey, to two doctoral theses, first to my colleague's, and two years later, to my own. To measure fatigue, we developed a new neurophysiological method, which eventually became of general importance in the diagnostics of myasthenia gravis. Having successfully defended our theses, we realized that our method should be tested in clinical settings. This insight determined also our medical careers: my colleague eventually became professor of neurology in a northern part of Sweden

and I in clinical neurophysiology in Uppsala, the medical fields where our method could be tested and, if found appropriate, also implemented. What is the lesson of this episode of our lives? An unexpected suggestion from a superior, an event (either success or failure) or an (in)evitable logic cause can turn the rudder of our lifeboat into completely unexpected and unknown waters. Be open to sidekicks.

## Blindness to facts

During the development of our recording method, we were confronted with misbelief and suspicion: “Your interpretation must be wrong”, “Since long it has been generally accepted that …”, etc. Some opposing arguments were based upon immature concepts or just defending prestige of the opponent. Luckily, we had local cheering support encouraging us to collect further data, which were in favor of our hypothesis and, finally, proved our new ideas solidly grounded. Retrospectively, I see that many of our opponents’ comments were excusable, as they were based upon the knowledge, insufficient at that time, while quite a few only tried to defend “finality” of their own theoretical buildings of complex processes. If the latter opposition had been intentional, it was not scientific at all. Openness to newly proposed explanations is a proof of one’s personal broadness and scientific integrity, willing to accept corrections of the existing interpretations, thus allowing progress in science and contributing to survival.

## Continued research

In due time, I needed help and inputs from others to continue methodological developments and clinical testing. Neurophysiology is a field where engineering definitely plays an important role. Many young people with engineering background came and brought knowledge and progress into my daily job, with some of whom I still collaborate (my son and another engineer for more than 40 years). Naturally, also medical colleagues, both physicians and technicians, were joining my small group. In neurophysiology, small teams have sometimes made great impact, e.g. when it comes to the development of new principles and distinct physiological patterns, often resting on relatively small number of experiments. Faced with such a type of arrangement, I accepted it as a challenge. It helped me design a model of work in clinical laboratory, which was large but understaffed. Hence, I always had foreign

collaborators, visitors, post docs, trainees, but usually only one or two at a time. When it comes to collecting large amount of data or to fine tuning exact numerical descriptions, it is necessary to attract collaboration, preferably from several laboratories. I reiterate – in specific situations, a small group of temporary but devoted colleagues can achieve a lot more than a big fixed team.

Should you choose to go into research or not? In the early phase of medical career, a young doctor usually still has the advantage to be flexible. It is wise then to sit down, contemplate and define his/her main goal or preferences: to help sick people by hands on, to help patients and the profession by research, to solve specific problem, to achieve academic merits for a professional career or just to earn money.

If you are aiming at the academic path and are looking for scientific projects, it is definitively the easiest way to join an existing group with ideas, resources and atmosphere.

## Research and interaction both give and take

Research of different intensities has been a great part of my active life. The reason is obviously that I liked it. Otherwise, I would have stopped it. Overall, the efforts have been worth a lot for me and later for my wife. To achieve something that has reached patients, has given me great satisfaction. It has been most gratifying to meet, train and cooperate with all the people I have seen over the years, a great privilege to work with people with different local traditions, patterns of thinking, and even from different cultures of their families and countries. All these differences enriched me, and my collaborators in the lab, as well. We value this experience ever more as time goes by. Trying to understand each other, accept differences of opinion and save filtered opinions, uncertainties and wisdom from of others, gives a person the chance of growing, progressing as a human being. I often feel the rewarding component of collaboration, when I now meet people, who have been to our laboratory even long ago.

However, it is also demanding: it takes energy, consistency, patience and time, which all could be devoted to something else, also of life importance. I am happy that myself, as well as my family have been able to accommodate this “disturbance” into our lives by resting and socializing at week-ends and during summer vacations. The time taken from the family, namely, is definitely a serious factor, but its influence depends on its acceptance and understanding of the own family. I did not hear any strong objections to my late nights in the

lab, but I am well aware that my family, my wife and three children, missed me quite often as a husband, father and – not last but least – also in the kitchen and in sports engagements. The time at work and overtime in research definitely competes with the time at home: a hard to solve dilemma!

We had a period at home, when we had to decide on an invitation for a great job offer from another institution abroad. The family sat down and physically listed pros and cons for such a step. When we saw the list and realized its content, the choice to stay was easy. I recommend you to make such a pros-cons list in periods of route selection.

## Scientific approach

There are many approaches on how to work in a scientific mode. I have not used other than traditional rules, with formulating hypothesis, trying to oppose it and formulating final theory or statement. The tools are knowledge and ability to formulate the hypothesis, the methods, experience from previous work, the interpretation, and the presentation. In this row of laying bricks, you have to be honest to yourself, to readers and to science. Dishonesty may come in various ways of scientific misconduct: data manipulation (fabrication, selecting suitable, omitting unfavorable), fabricating results, plait, ignorance to published material, disinformation about authorship, and so on. Ethical rules in science are well defined but, unfortunately, scientific misconduct persists. I hope that ethics and honesty will be leading stars in your work, in the small and large scales.

In writing reports, I have often found it useful to let a manuscript stay in the drawer for a few months to mature. When I read it again, I quite often discovered ways to improve it with better interpretation and better formulation.

## Honor the unexpected

When competing or conflicting results appear, you may be on the brink of something new. In my EMG work, I have for example usually found a good correlation between EMG results and the morphological results from a biopsy. They complement each other. As the matter of fact, you do not need both of them, if they are so concordant? However, when we sometimes trip on conflicting findings, we have to sit back and think. Unexpected constellation of the EMG and morphology findings has led to a few new interpretations. In another example, we

find neurophysiological changes but no clinical signs of symptoms. This may signal that we have detected subclinical pathology. So, whenever results from two different methods testing the same type of pathology are conflicting, do not just blame one of the methods as insensitive or erroneous. Instead, grab it for your further consideration.

## Simple things are killed by daily rush

After retirement, my blood pressure became lower, my sleep better and my mind more focused. I had time for reflections on life, future, job. Regarding job, I just sat down to think on the recording that we obtained in some of our daily routines. I summarized them into a lecture, that I sometime call “Did you think of this?” It is amazing how simple things like a CMAP in neurography can be dissected and result in new knowledge about this simple parameter that has been in front of our eyes year after years without reflection. In the same way, the relation between muscle fibers and the generated motor unit signal in health and disease can be given very simple explanations if we just take the time to think. Eye-opening facts that should be communicated in the early stage of training.

## Teach, spread your message

Whether you are an academician or a full-time clinical doctor you will have something to tell your students, colleagues and to everyone interested in your field, especially after a few years of added experience. Show and talk about what you have learnt and experienced! We have to pay back for what has been taught us. On the academic side, teach whenever you are given a chance. We learn when we teach. At every moment, one must check the way and accuracy of a given message and often reformulate statement. Sometimes you realize that the listener’s question is a sign of your own ambiguous presentation or even erroneous thinking. The next PowerPoint presentation should be better than the previous. In my age it happens, not infrequently, that someone comes up and says “oh I remember when you said …”. So, be careful when you communicate serious things, you may get it back 20 years later.

## Implement what you have learnt

When you sit as a listener at a lecture or participate in a conference, you get a lot of new knowledge presented to you. Open your mind and consider if this is both new and useful for you. We are trained to be critical in our daily life, but do not block your mind for new facts. You can often save the message in your mental clouds. Depending on your own position you may be able to bring the new knowledge home to introduce new methods, new ways for interpretation, and for general improvements. Take it with a critical but open mind.

## Focus on the task

Today the wave of information – flow of emails, continuous updating of low-grade news, clicking mobile phones and videoclips – causes mental contamination. This is a challenge for our concentration and our ability to focus on the task at hand. I enjoy seeing how the members of a musical band when playing a difficult passage watch each other, give a small nod or an eye and perform with success. I have had colleagues, who were more or less closed for communication when writing a paper, a paragraph or formulating an email. Focus on details is time saving and offers a private space. I have many other colleagues who – during the intense phase of experiment, interpreting and writing, are filled-up by this in daily conversion as a sign of their great passion for the present problem, a focused behavior. They do not go overboard with their manners and I enjoy seeing their intense drive to solve their problem. This may be demanding on the environment, and may become a social handicap. A balanced engagement is good for the social life.

I think that the ability to keep distance to distractions can be trained. In our hectic lifestyle where multitasking is taken as normal, the need for focusing should be brought to attention.

## Disappointments

Depending on the level of expectations, we face small or large disappointments in life. They may badly affect daily harmony and wellbeing and – by reducing energy – they my severely delay recovery. Examples from scientific experiments may serve for some comments. Depending on the importance of the expected results from a given experiment, failure may shake your self-esteem. New hypotheses must be formulated, new methods developed, more time must be set aside. All this is part of science and are expected obstacles. First, we have to

admit and realize the outcome. An unexpected or non-supportive result may provide new facts and boost curiosity and inventiveness. It is usually possible to extract something positive from a negative situation by answering to your own questions, e.g. “why did it end-up this way”, “was my hypothesis wrong, so that I have to reformulate it”, “were my methods inadequate for the task so that I should modify or replace them?”. You can come up with new knowledge and promising ideas. After a mental fresh-up, new experiments can be organized. If the result is again negative, it may carry another message. Perhaps the hypothesis is completely wrong and the expected correlations do not exist – a very important new fact. This is a harsh dilemma for any scientist, since negative results are very difficult to prove and, in addition, nearly impossible to get published. No publication took over the policy of the once time Journal of Irreproducible Results (1955–1994) which had humoristic approach to science, but to some extent reflected the problem. In general terms, we have to face adversity by accepting it and placing its importance into context in relation to circumstances, such as scientific truth, wellbeing and, ultimately, to quality of life.

## Short- and log-term-plans

The above have been an issue of my own considerations. Long ago, I had a serious medical condition, demanding many weeks of intensive care followed by several months of hospitalization. My survival was far from assured and even when I was getting better, I was luckily not involved in discussions on prognosis. After some additional weeks, when my situation improved and instilled some optimism, I started to plan for coming months and years. “I should really like to do this and that for my nearest, spend valued time with them and return to my job”. The planning boosted my optimism, which contributed to my rehabilitation and was perhaps comforting for my family, as well.

Another situation is the present. I have reached the age of close to 86, but I am again enjoying planning for summer vacation, family reunions and some events and trips. I can actually long for the wonderful coming occasions, where I may be present! The opposite would be a grey and non-inviting situation. In dark times, some degree of realistic planning is not only practical and bringing some order and time structure in life, but is also healing and encouraging the soul.

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