

Simplified transcript of Alex Khenkin's interview by Philippe Stamenkovic* on 16/08/2022 online

This interview is part of a series of interviews of former Soviet/Russian scientists emigrated in Israel, about their experience and conception of the relationship between science and (non-scientific) values, in the scope of Philippe Stamenkovic's postdoctoral project at the Jacques Loeb Center for the History and Philosophy of the Life Sciences, Ben-Gurion University of the Negev (Israel). Alex Khenkin is an organic chemist at the Weizmann Institute. Questions of the interviewer are in black and answers of the interviewee in blue. Parts of the interview which refer specifically to the relationship between science and (non-scientific) values have been underlined by the interviewer.

1 Introductory questions

In this preliminary section, I would like to ask you some questions about your identity and tasks as a scientist.

1.1 Motivation

- How did you end up as an organic chemist? What was your motivation for choosing this field?

Was born in Russia in 1951. In 1959 his family moved to Ukraine. Was in high school in Ukraine from 1965 to 1968, then studied in Moscow University in 1968-1974.

He attended olympiads in chemistry which was a competition taking place in high schools in Ukraine and all of the Soviet Union. Then received an invitation from a university as a student. Moved to Moscow (Moscow Institute of Fine Chemical Technology). Studied mechanisms of chemical reactions. After university, received a position at the Academy of science, Institute of chemical physics, 50 km from Moscow. In 1975 finished his studies, in 1980 got his PhD, and continued as research associate from 80 to 91. From 1991 invited to US (research associate) then in 1993 emigrated to Israel. Studied mechanisms of chemical reaction, especially catalysis.

Choice purely out of intellectual interest for the discipline. In addition, being a university student enabled him not to go to the Soviet army, which was important for him.

- Was your choice influenced by some specific circumstances, either personal or related to the political situation in the Soviet Union? Was it more or less fortuitous?
No.

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1.2 Description of work

- Could you describe me your current work, daily tasks and activities?
Oxidation of Alkanes, to create models of biological science, same reactions as in body but in chemical reactors.
Catalysis field and mechanism of chemical reactions.
- Has your line of research evolved during your career? Why?
No.

2 (Descriptive) questions specific to the Soviet Union (SU) / Russia

In this section, I would like to ask you some questions specific to your experience as a scientist who has worked in the Soviet Union / Russia. My questions concern either your personal situation and work, or those of other people which you have witnessed.

I am interested in the relationship between science and the extra-scientific context (be it social, political, ideological or economic). I am especially interested in the political and ideological values specific to the Soviet regime.

2.1 Description of the influence of non-scientific values on the various phases of scientific inquiry

- Did you notice, in your (or in others') activity as a scientist in the Soviet Union / Russia, an influence of the extra-scientific context / non-scientific values concerning:
 1. what to investigate / the choice of research avenues and questions?
 - (a) Regarding pure and applied science : much science in the SU was devoted to applications. Pure science was threatened by non-scientific interests, because it had no applications. But in the end the regime decided to let it go. Was there pure science nevertheless? Or was there only "big science" related to engineering/the atomic bomb/etc.? Were theoreticians supposed to bring about practical results, or were they allowed to develop their own thoughts?
At the Academy of science, they did pure science. No application in his field. Funding depended from how your boss was well connected to academic circles. But it concerned only equipment and materials, concerning human resources you received your salary regardless.
Motivation: only intellectual interest. The boss was free to choose his research avenue, but you have to do what your boss does. The organisation of the lab was quite hierarchical, the boss told the staff at the laboratory what to do. Different from the US and Israel because here every professor has the possibility to find grants from other sources. In the Soviet Union, they didn't care about the money, in the sense that the salary only depended on your position in the scientific institute. Ranks were junior researcher, researcher, senior researcher, professor. In many cases to obtain a higher rank you had to be in good relations with your boss, which could cause tension between scientific workers.

- (b) Did you have to follow the already existing research avenues of the West (instead of investigating new ones), in order to “catch up and surpass” (*Dognat’ i peregnat*) American science (original quote from Stalin referring to the atomic bomb in 1946, which became a popular Soviet slogan during the Cold War)?
Were not forced to follow the research avenues from the West. Had the academic journals of the West and were trying to do something else.
2. how to investigate it (gathering of evidence and choice of methods, including from the moral point of view):
- (a) for example the building of hypotheses/models (for example, Kojevnikov talks of the heuristic influence of Soviet ideology on collectivist models and terminology in condensed matter physics)?
When he was a student, quantum chemistry was forbidden to study, because it was bourgeois science according to communist theory. Only when he came to academia started he to study it. In the 70s and 80s, it was common knowledge that quantum chemistry was good science.
Very difficult to find certain chemicals, certain materials were impossible to find. Almost everything you had to synthesise yourself, for both economic and political reasons.
3. what to conclude from our investigation: the acceptance or rejection of hypothesis/theories?
- (a) for example, to possibly take more risks (make/accept more risky hypotheses, see the story of the collectivist models in physics)?
Hard to say. His boss’s theory: nitrogen fixation in nature. Now it is well known that only bacteria can fix the nitrogen. In the 70-80’s there was a hypothesis that high organisms including humans can also fix the nitrogen. One of the professors who had a high ranked position in the Party supported this hypothesis and tried to suppress his boss’s research. He did not succeed, because he had no experimental evidence.
Activation of alkanes: in their lab a system for activation based on platinum solutions. The transformation of methane into liquid fuel has been an important task until now. It was well known that this transformation is possible only at high temperature and in heterogeneous, non-selective multi-steps processes. In their lab it was found in the 70s that this activation is possible at ambient temperature in a one-step, selective reaction (principal investigator was prof. A.E. Shilov). Many scientist included in the West didn’t believe in this finding. Now it is well recognised and called ‘Shilov chemistry’. A scientific struggle took place which they won because they had the evidence.
4. how to use and communicate the results of our investigations:
- (a) For example, to disseminate or not (internationally, in the logic of competition against the West; but also, in the SU, against rival Soviet scientists/schools) the findings/results?
They could publish their research in Russian journals, but very difficultly in Western journals. You needed a special permission from the KGB to publish in Western journals.
It was also very difficult to attend international conferences. You had to pass through a special department in the communist party to get permission to go

abroad. Some people asked stupid questions about politics, and you had to give the right answer.

5. Organisational/institutional aspects:

- (a) For example, what were the criteria for hiring/promoting people in the SU (membership of the Party? Etc.)?

It helped to be a member of party to get a promotion. But his boss was not a member of the communist party. But it was an exception, you had to belong to the communist party to reach top level positions.

- (b) for funding?

State money, distributed like a salary to all members of the institute according to their ranks. Funds only for instruments, chemicals, materials (which his boss could find). But not for salary, for people.

6. Teaching:

- (a) regarding the content of your (or others') courses?

He only had graduate students whom he taught how to do research practically.

- (b) the way they are taught (for example, the textbooks or references used)?

Chemistry was quite a general subject. In addition they had to study philosophy of Marxism, history of the communist party. When you defended your PhD thesis, you also had to pass a test in Marxist philosophy.

2.2 Positive or negative influence of ideology

- Would you say that politics and ideology could have a beneficial influence on science (and not only a detrimental one, as Lysenkoism typically has come to exemplify in the West), in whatever stage of research work? And if yes, how exactly (which stage, which process)? To what extent was this effect specific to the SU/Russia (and not to be found in another political/institutional regime)?

The ideology had no influence on them. It was purely formal.

He has both a positive and negative opinion:

- Positive: you don't spend a lot of time to write proposals, more free time to do research.
- Bad: there were people doing anything, bad science, because they wasn't any competition, same salary for everyone.

2.3 Evolution between Soviet Union, Russia and Israel

- [How the situation has changed for science after 1991 in Russia] Regarding now the evolution between the SU and Russia:
 - How did the collapse of the SU and the advent of "democratic" Russia affect research? In which case was it a matter of funding, of good scientists leaving the country, or something else?
Bad effect, many people left, almost all went to the West. There was no money, no food, hence no scientific research.

- Did organic chemistry flourish in the SU, and then decline after the Soviet regime collapsed in 1989, as for physics ?

Yes, especially because instrumentation was very old. The only exception was in Novosibirsk Institute of catalysis. They had good equipment before the collapse, and continued to work afterwards because they received money from Western countries.

- Regarding now your situation in Israel:

- When and why did you come to Israel?

1993.

- What is the difference with respect to Israel (once you got there)?

It is quite different: in Israel it is the American system, every professor has his own funding, no influence from the top. The difficulty is to get these funds. This is problematic, but this is competition, funding is given to the best scientists.

- Regarding the scientific environment (selection criteria of promotion, hiring)?

Only based on merit, hopefully. The State of Israel helped a lot of scientists from SU/Russia to be adopted here, thanks to specific programmes (e.g. Shapira).

- Regarding non-scientific values, including your own?

These funds permit you to choose your field of research, your research avenue, especially funds from the Israeli chemical society. Otherwise there are private funds from companies which are directed towards specific subjects.

People who have lived in Israel for a long time have relations in Israel, people from Russia don't have such possibilities. There is protectionism.

- * For example the “will to work hard”: was it lost after you came to Israel? Did the Soviet / Russian regime provide you with a specific motivation which was lost once you arrived in a ‘Western’ country?

In the SU you worked hard because you were interested in what you did. Here in Israel they also work hard, they start from zero in the scientific community. What you have achieved in SU is not taken into account.

In Israel he could do research which he couldn't do in the SU because materials are much higher level here.

3 (Normative) questions about their own views

- In science and in philosophy of science, there is a common view according to which science should be free from social, political and religious values and interests, either at all stages of research (from the choice of research avenues to the communication and use of results), or at least in the core phase of acceptance/rejection of hypotheses/theories. Do you subscribe to this conception of science which *should* be value-free (even if it is not realised in practice)? To which extent: in the large sense (during all phases) or only in the restricted sense (during the core phase)? Why (can you give reasons for holding this view)? If values should influence science, how should they?

Something in the middle. Of course science should depend on society. For example, for climate change or Covid, which has such a big impact on society, scientists should help society.

But of course fundamental research should also be able to proceed without influence from society.

In his field false positives/negatives are not so important. But in medicine this is important. For example, there was a theory about special proteins in the brain which were responsible for Alzheimer's disease. But actually this theory was wrong, although it influenced much research. Sometimes scientific error can have a lot of influence on society. In many fields, only professionals can understand the influence. Therefore the influence of the extra-scientific context should be evaluated on a case by case basis [suggested by the interviewer]. You have to have expertise in the field.

4 Potential activity as an expert

[Potential activity as an expert (i.e. as a scientist providing advice for public authorities), in the SU/Russia, in Israel or elsewhere.]

- Do you have any activity as a scientific expert (providing advice for public authority)? Could you describe it [descriptive]?
No.
- How do you understand your role as an expert [normative]?
Not applicable.

5 Concluding questions

- Is there something else you would like to add or talk about?
No.
- Do you know other natural/social scientists from SU or Russia whom I could interview?
He will ask them first.