

HUNGARIAN'S SECOND STEP OF EMIGRATION: TOWARD THE NEW CENTERS

G. PALLÓ

Institute of Physics
Technical University, H-1521, Budapest

Received December 12, 1989

In our imagination 20th century emigration of scientists lives according to how Leo Szilárd remembers his own case: "Hitler came into office in January '33 and I had no doubt what would happen. I lived in the faculty club of the Kaiser Wilhelm Institute of Berlin Dahlem" Szilárd wrote "and I had my suitcases packed. By this I mean that I had literally two suitcases standing in my room which were packed." In the beginning of April he suddenly felt that the moment had arrived, took a train with his suitcases and left Germany for good. The continuation is but a pinch of salt to the story: fleeing in masses began the next day and the Germans started to control the trains. Szilárd's conclusion is simple: "if you want to succeed in this world, you don't have to be much cleverer than other people, you just have to be one day earlier than most people." [1]

Szilárd, of course, always did his best to be "at least one day earlier". The famous Hungarian immigrant scientists like e.g. Békésy, Teller, von Neumann, Wigner suffered the state as other refugees had to suffer, but they always indulged also in their favourite hobby, in something "different".

According to its title, this paper is about the second step of emigration of Hungarians, that was preceded also in their case by a first step I had previously spoken about and which I therefore wish to summarize in short here and now. [2] This first step took them from their native country to Germany which had been the centre of European science in up till the first decade of the century. But they left for Germany not only as a result of the pull exercised by the centre, as could be supposed on the basis of the centre-periphery relation but also because of the push originating in Hungary and exercising a similar intensity. This latter was, of course, mostly of a political character: it was in connection with World War I, the disintegration of the Austro-Hungarian Monarchy, the leftist revolution erupting after the war and the then following reprisals and antisemitism which strongly affected those that fled at that time. But, of course, Hungary promised no great perspectives for scientists of such a quality in general. Neither actual nor potential research conditions could be but compared to those in Germany and

still, surveying the individual cases we find that the push emanating from their country played a dominant role with most of them. Two types of pushes have to be differentiated: the direct one that touched upon the person of the scientist itself (e.g. George von Hevesy and Theodore von Kármán were hounded out because of their activity to during the 1919 Bolshevik revolution) and the second type of push when the scientist was harassed because of his family (e.g. the families Teller and von Neumann during the Bolshevik revolution). Though never denying the effect from the pull from Germany a high importance is attributed to the push exercised by Hungary.

Whether this way or the other, the important Hungarian scientist-talents got to Germany, where, as formulated by Ch. Weiner, they became members of the international "seminary", that founded modern theoretical physics and later migrated to the other side of the Ocean [3]. They got to know each other and became a loose group esteeming each other in this seminary and as a result their fate, their activity is spoken of as a specific "Hungarian phenomenon". [4]

Just as they were "different" in the first step because they arrived in Germany as an effect of push, they were also "different" when making their second step. They differed from the general cases, (which never existed of course) because they hardly can be included in the wide category of "deutschsprachig" scientists as they were Hungarians and for them leaving Germany did not mean the agonizing effect of leaving their native country. But they were also "different" because even in the second step they did not follow the plausible pattern.

The pattern to be concluded from Szilárd's story is that after April 7, 1933 viz. after the infamous "Law for Restoration of the Career Civil Service" was born, which made it practically impossible for Jewish scientists to continue working in Germany, a kind of "scientist-exodus" began as a result of which the centre of science shifted to the United States. It is a matter of debate, naturally, whether Nazism in itself caused the process or together with other facts, or perhaps only accelerated a process that had already begun. [5] What is important is that Nazism expelled a number of excellent scientists who tried to settle down in other countries, mainly in the United States and to continue their career there. According to the formerly used terminology the substance of the pattern is that the old centre exercised a strong push and as an effect the scientists moved to the new centre.

To be able to describe their route it is expedient to differentiate the types of emigration. We are speaking about enforced emigration when the prevailing conditions do not enable normal life and work anymore; spontaneous emigration follows if the scientist changes countries without immediate compulsion, seeking better possibilities. It is obvious that the migration of Jewish scientists from Germany was an enforced emigration as not only their work

but also their life was in danger. Spontaneous emigration however was when a person found unanimously better research or living conditions outside his native country as was the case e.g. for a number of East-European scientists in the seventies and eighties, in the United States. One can thus say that prior to World War II, an enforced emigration was observed after the war, disregarding the consequences of some political upheavals, we saw a spontaneous emigration. But, as already mentioned, a number of things happened "differently" with the Hungarians.

True, there were those who followed the basic pattern: they became victims of Nazism as Leo Szilárd or Edward Teller. Neither of them went directly to America from Germany, they made a stop over. His old friend, professor Eucken told Teller that though he would like him to remain at his side, he cannot see any future for him in Germany. This was the situation when he ought to look for an American opening. But this was not the natural place for Teller, it was Hungary. He returned and his mother tried to persuade him to remain. Teller's answer however was: "in the long run, I will be in much greater danger if I stay at home." Thus, at the invitation of G. F. Donnan he first went to London, and then spent a year in Copenhagen, with a scholarship in 1934. In the meantime Donnan secured him a lectureship but also the invitation of a friend, G. Gamow arrived to George Washington University with a position as full professor. He was then 26, and on the one hand good pay, a prestigious position awaited him while on the other, the threat of a world-wide catastrophe, dark tyranny, persecution. The decision was not difficult to make. [6]

Denis Gabor is the inventor of holography, a Nobel prize winner who also followed Teller's solution but stayed in England. The only non-negligible difference between the two is that Gabor returned to Hungary and accepted a position in the research laboratory of the factory Tungsram which at that time could boast with up to date products and the best experimental research institute of the country. However, it was in no position to compete with a job offer from England that enticed Denis Gabor from the country in 1934 and it was to his great advantage. As already mentioned, he stayed there and did not follow Teller's example, did not move to the United States [7].

Szilárd's case strongly resembles to that of Teller. He, too, arrived in the States via England, but with a more restricted outlook, he had a scholarship but for six months. He sent a letter to his friend, Michael Polányi, saying that he intended to travel to America but a year before the outbreak of the war, a statement that sounded laughable at best as who could have known when the war would start; but Szilárd held himself to his statement with acceptable accuracy. [8]

Polányi, on the other hand, belonged to those who in the beginning contemplated the possibility to protest against political conditions, and that

together with Planck and Schrödinger. In a short time, though they found that there was no hope of any result [9]. Szilárd who for some mysterious reasons tried to organize everybody for everything wrote: "M. Polányi like many others took a very optimistic view of the situation. They all thought that civilized Germans would not stand for anything really rough happening." Though he had an offer to the chair of physical chemistry in Manchester, he did not want to make use of it, because he believed to lose his productivity because of the change for at least a year. Szilárd however persuaded him not to give a definite answer but to refer to something that would enable him to play for time. After the Reichstag was set on fire, Polányi took leave from his institute with an aching heart. It was luck that, at Szilárd's advice he did not burn his boats to Manchester. According to a colleague: "he said previously he had refused the offer extended to him on the grounds that he was suffering from rheumatism, but it appears that Hitler cured his rheumatism" [10].

George von Hevesy the Nobel prize winner inventor of the radioactive tracer method was also a professor in Freiburg, Germany and similarly to Polányi, he also renounced his job voluntarily but did not leave the continent. In 1934 he returned to Copenhagen from where the University of Freiburg enticed him in 1926. From Copenhagen he left for Sweden in 1943, his last living place, as a result of immediate persecution. [11]

The intensive push emanating from the Nazi Germany thus sent some people to America and some to more secure European countries. Mathematician George Pólya, author of the book: "How to solve it" was taken by the storm from another country, Switzerland, across the Ocean. In vain was Pólya professor of mathematics in secure Switzerland, as he put it he did not wish to live on the same continent with Mr. Hitler and so rather chose the opposite bank, where together with his friend and co-author for life, Gábor Szegő, he landed within a short time in Stanford, where he dropped anchor. [12]

The really "different" ones did not get this way to America, through more or less enforced emigration. The "taking leave" of Polányi, Hevesy, Gábor, even Teller and Szilárd can be listed with the type of enforced emigration. The great renouncers, it is true, stayed in Europe: neither Hevesy, nor Polányi or Gábor left the old continent. And from among those who did leave it, several were not forced to do so not even, as say George Pólya.

An example for spontaneous emigration is, e.g. E. P. Wigner and John von Neumann. The circumstances were told by Wigner in detail to Th. Kuhn in an oral history interview gathering together the historical sources of quantum mechanics. "I received a telegram one morning said Wigner: Princeton University offers you a lectureship of ... \$4000. Please cable reply" "Johnny by that time had a telegram somewhat earlier offering him a similar thing (about \$5000). But \$4000 was an inconceivable sum for me. I never thought it existed." Wigner related the offer to two well-known professors,

Becker and Haber, with whom he was in direct connection in Germany. Both advised him to accept, and Haber immediately called the minister on the phone and told him indignantly: "Well, it is too bad that the Americans have to tell us whom we should promote." [13]

From Ch. Weiner's and Mehra's oral history interview we also learn that it was P. Ehrenfest who stood behind the offers. It was he who said that if the scientific spirit was to be modernized in Princeton, not one but two foreigners should be invited. It is characteristic for Wigner's legendary modesty to say that a claim was put in for von Neumann in any case and thus they looked around for somebody who published jointly with von Neumann and he was found. The fact that he was somebody in his own right, never entered his mind. [14]

All this happened in 1930 when Nazism was but a distant threat. The six month stay was extended with a visiting professorship, which, very wisely, meant six months in Princeton and another six months in a town they were to choose themselves. After a certain time this solution lost its beauty. It was perfectly obvious to Wigner that: "the days of foreigners in Germany, particularly with Jewish ancestry were numbered." He was farsighted enough to know that: "the regime would precipitate a blood bath in Europe or would subjugate nations without war." When Weiner asked him if he did not judge the situation on the basis of Szilárd's prophecy, Wigner meant that was as obvious as the fact that it was colder in December than in summer. [14] This shows that there were also others, who "arrived one day earlier."

Theodore von Kármán's case is very similar to that of von Neumann and Wigner but at the time he emigrated he was no more a promising young man but a professor in Aachen who had already made his name, one of the most important scientists in aeronautics. He made up his mind to move to America after a long courting process that had begun in 1926. An institute of aeronautics was supposed to be established at Caltech, from a Guggenheim foundation, it was also planned to start training specialists and Kármán was invited to a lecture tour serving to get known mutually. Then, seeing the success of this lecture tour, he was bombarded with ever better offers. In 1929, a letter written by R. A. Millikan promised that he could return to his chair in Aachen regularly and also that in Akron, Ohio a branch of the Pasadena laboratory would be established and Kármán would be head of both. He finally made up his mind and moved to The United States in 1929 but up till 1934 spent part of the year in Aachen. At that time he received a letter from Germany asking him to decide where he wanted to live, there or in America. The letter made him renounce his post in Germany without second thought and he took up his abode in America, to live a life stimulating from every respect. [16]

The mentioned cases obviously belong to the sphere of spontaneous emigration. The pull starting from America had a stronger effect than the

push from the side of Germany though no one is denying the role of the latter. Wigner and von Neumann could probably thank the highly advantageous offers to the one-sidedness of contemporary American physics. The field of physics was rich in excellent experimenters but very poor in theoreticians and recognition of this made the physicists achieve to try to wind up this one-sidedness by importing excellent experts. It was tried to get near to Einstein, Born, Heisenberg, but it was obviously easier to get Neumann and Wigner [17] as for them this was also a second step, their roots in Germany were not too deep. To be sure, this pull made itself also in Teller's case with the difference that Teller could be considered a refugee already when the invitation was extended, while Neumann and Wigner were not yet. Kármán also had to thank the American development intentions for his invitation, and also to his specific ability that he was able to handle mathematical theory with a unique assurance in a highly practical field. After all, the cause behind the pull may be found most probably in the requirement for theory in American science.

Let us say that the "differentness" of Hungarians, or at least some of them was that in a period when Germany's push was highly dominant in the dynamics of scientific migration, they much rather felt the pull of the new centre which then took them away from Europe.

What then followed was the war when not much migration was possible if only not as in the case of László Zechmeister, an excellent organic chemist who received an invitation as a lecturer in chromatography in 1940 when Hungary had not yet entered the war. Zechmeister arrived in the States but could not return because of the war and he too found a position in Pasadena, at the Caltech. [18]

Spontaneity is unequivocal in the case of emigration following the war and one would believe that the pull to manifest itself, as by that time America grew to be a leading scientific power and the ravages of war also brought her further comparative advantages. Once again all this is not quite the case for Hungarians. And the latter statement contains, implicitly, that Hungarian scientists, and not unimportant ones did remain in Hungary.

George von Békésy for instance had a chair at the Budapest university and in his laboratory he undertook very important work first of all concerning the mechanics of hearing for which, though a physicist, he was awarded the medical Nobel prize. In one of his recollections he states that it was quite obvious to him that Hungary would be occupied by the Russians. As he wrote, his mechanic was deported to Russia, his equipment and writings were destroyed [19]. "The whole section under attack was destroyed" he wrote "including the section where I lived, near the Danube. The highest wall left was about one meter high. I had many friends living in that section so I visited them before I decided to leave. I shouted their names under the blue sky but nobody came out so I went from one opening to another as I knew they had

to come out for water." He concluded: "Since it was obvious that I would not be able to continue my scientific work, I decided to leave Hungary." [20]

This highly dramatic description suggests that the cause for emigration was the ravage caused by war. However, his correspondence indicates that the term "leave" was then considered but a "temporary leave." He wanted to return after his scholarship to Stokholm terminated and he went to Stockholm only to be able to work till work conditions in his own institute would be restored. In the meantime, in 1947, J. S. Stevens invited him to Harvard, an invitation he could not resist and also the situation in Budapest had not cleared up in a year. He asked for further leave from the university to be able to accept the invitation to Boston in one of the six months of the following year. He had to fight for the year prolongation and from the intensity of this fight and from a number of private letters one may draw the conclusion that he really wanted to return. But, in the meantime, the political situation had changed. The situation described by one of his colleagues in a letter must have been unequivocal and clear enough to make him decide for Harvard, for good.

But it was described by Békésy himself that in his case, however strange it may seem, the push was stronger than pull emanating from the heights of Harvard because, as he puts it, the style of research in Hungary was more advantageous for him than the one in America. But it seems sure that the drastic transformation of his chair must have put an end to these happy conditions.

The soil seemed to have slipped similarly from beneath Zoltán Bay when, in 1948, after an invitation to Vienna he no more returned to Hungary. Bay was famous mainly for his experiments concerning radar echoes from the moon and later for his coincidence experiments undertaken already at the George Washington University. The micro-waves reflected from the moon he measured as head of the laboratory of the already mentioned Tungram factory [22]. During the war he put up a fight to save the factory known for its very high level, but following the war even he could not do anything, the Russians dismantled and transported away the most important machines. Obviously, he believed to have no future here anymore, and so he made use of his American connections. [18]

The push effects brought about by the post-war situation are rather similar, as for instance the case of the Nobel prize winner Albert Szent-Györgyi, who discovered Vitamin C. Though it should be mentioned that these effects were less direct in his case. Szent-Györgyi did not believe his research possibilities were gloomy but the political situation, a fact that was more important in his case than in that of other scientists. He belonged to those who — similarly to Békésy — returned to Hungary after a time spent abroad (that was back in 1930) to continue their career here. He was in no imminent danger because of ancestry during the Nazi occupation of the

country, but very much so because of being an active resistant who, tried to establish mainly English connections and prepare Hungary's jumping out from the war. He hoped to become prime minister after the war and thus have a decisive influence in a democratic rebuilding of the country. Instead he could achieve but a scientific-political role, though a very important one.

Szent-Györgyi paid a visit to the Soviet Union as early as 1946 and spoke about it with enthusiasm in newspaper interviews. Together with his friend the author Lajos Zilahi he became co-presidents in the Hungarian—Soviet Cultural Society and as vice-president of the Hungarian Academy of Sciences he played a decisive role in modernizing science, fought a great fight to reform the scientific community which was backward in many respects. [24]

In 1947 Szent-Györgyi, whose voice could be with great strength in public life, in politics and in the newspapers left for Switzerland. His close friend Zoltán Bay put the question: "Albert, are you leaving now not to return?" "Upon my word I will return" was the answer. We do not know for sure why he did not. According to Bay, his decision was made because he got news that one of his acquaintances, István Ráth was arrested and beaten up. Szent-Györgyi lodged a threatening protest with the Soviet foreign minister, Molotov. Ráth, who was his partner in a smaller pharmaceuticals factory to be founded jointly was set free and left for America within short where he continued to support Szent-Györgyi's research work. [25] The substance of the matter is that he probably understood—according to some opinions he was warned—that his personal freedom is endangered, not in the least because of his wartime connections with Western powers and that, at that time, was a threat to life. I did not succeed to find any documents proving the mentioned danger but fright itself was more than enough to such a decision.

Szent-Györgyi thus did not emigrate because of an American pull-effect, he did not even believe much in research possibilities. This is indicated by the fact that he requested a prolongation of his stay abroad several times and felt the situation sufficiently sure for the final breach only after having obtained a suitable position in Woods Hole.

He and his colleagues realized a certain mixture of spontaneous and enforced migration. They left on their own decision towards centres offering better research and living conditions but in this decision the fact that they did not see any guarantee for their further work and even were afraid for their personal safety, played a major role. Their final decision was made only after this standpoint had crystallized and this indicates that pressure may have been more important than the spontaneous element.

To sum up it can thus be said that the most important Hungarian scientists arrived to America from their countries situated along the periphery in two ways. On the one hand they arrived from Germany, viz. through a two-step emigration and on the other they went directly from their mother

country. Those of the first group emigrated before the war, while the latter arrived after the war. It is curious to note that in the case of the first group scientists the scientific possibilities of the new centre seem to have made a major impact than the pull-effect emanating from Germany. This of course may be not because the Nazis gave them a favourable treatment but because they left earlier for the United States before being persecuted. The other group, where Nazism—at least directly—could not have played a role, decided to emigrate not so much because of the attraction of the American centre but because of the push making itself felt due to the gradually more threatening Stalinism. In both groups enforced and spontaneous elements can be observed but quite unexpectedly we find that among those who left for America during Nazi times spontaneity had a relatively high effect while among the post-war ones enforced emigration played a high role. A sort of discrepancy can be seen among the motives, however: the push-effect started in each case from outside science, from politics, from some kind of totalitarian system. The pull effect on the other hand manifested itself in most cases from within science, from the new research possibilities opened up, and sometimes financial causes played a role as well.

If we now compare the two steps of the emigration of Hungarians, the hitherto investigations indicate that in both of them the push effect coming from the peripheries was as significant as the pull-effect coming from the centre. But, while the push-effect had a political character in both steps, the pull-effect seems to be more of an intellectual nature in the first step than in the second. While in Germany the highly stimulating atmosphere was the main attraction, this cannot be proved in connection with America for the scientists belonging to the "Hungarian phenomenon". It seems rather probable that the main attraction here was the possibility of research work and a life free from danger, but of course also a scientific structure was needed that was able to absorb them. The intellectual value produced by their work was the means with which they paid generously for their reception.

Literature

1. SZILÁRD, L.: His Version of the Facts. Ed. by S. R. Weart, G. Weiss Szilárd. MIT Press, Cambridge, 1978. pp. 13—14.
2. PALLÓ, G.: The first step of emigration: from the Hungarian periphery to the centre. 4S/European Assoc. for the Study of Sci. and Technol. Conference, November 16—19, 1988 Amsterdam.
3. WEINER, CH.: A new site for the seminar: the refugees and American physics in the thirties. In: The intellectual migration, Europe and America, 1930—1960. Ed. by D. Fleming, B. Beily. Harvard Univ. Press, Cambridge, Massachusetts, 1969.

4. PALLÓ, G.: A case from the peripheries—the background of the “Hungarian phenomenon”. Paper presented at the International Congress of History of Science, Univ. of California, Berkeley, July 31—August 8, 1985.
5. The different interpretations of the process were discussed, e.g. by K. Fischer: *der quantitative Beitrag der nach 1933 emigrierten Naturwissenschaftler zur deutschsprachigen physikalischen Forschung* (The quantitative contribution of natural scientists to German language physical research). *Ber. zur Wissenschaftsgesch.* 11/1988. pp. 83—104.
6. BLUMBERG, S. A., OWENS, G.: *Energy and Conflict: The Life and Times of Edward Teller*. G. P. Putnam's Sons, New York, 1976. pp. 49—63.
7. This was discussed by Th. E. Allibone a co-worker of Denis Gabor in a paper given in Budapest. Published in Hungarian by *Tudományos és Műszaki Tájékoztató*. 33 (1986). pp. 188—192.
8. See ref. 1. pp. 20—21.
9. WIGNER, E. P., HODGKIN, R. A.: Michael Polányi. *Biogr. Memoirs of the Roy. Soc.* 23. (1977). pp. 416.
10. Ref. 3. pp. 13—14.
11. COCKROFT, J. D.: G. de Hevesy. *Biogr. Mem. of Fel. of the Roy. Soc.* (1967). pp. 125—166. —H. Levi: *George de Hevesy. Life and Work*. Rhodos. 1985.
12. Interview with G. Pólya. Stanford 1983.
13. Interview with E. P. Wigner by Th. Kuhn. December 4, 1963. *Archives for His. of Quantum Phys. Office for Hist. of Sci. and Technol. Univ. of California, Berkeley*, pp. 19.
14. Interview with E. P. Wigner by Ch. Weiner, J. Mehra. November 31, 1966, pp. 2.
15. *ibid.* pp. 6.
16. KÁRMÁN, TH.: *Lee EDSON: The Wind and Beyond*. Little, Brown and Co. Boston, Toronto. 1967. pp. 119—140.
17. See HEIMS, S. J.: *John von Neumann and Norbert Wiener*. MIT Press, Cambridge, Massachusetts. 1980. pp. 164.
18. SZABADVÁRY, F.: László Zechmeister (1988—1972) *Our Language and our Culture* (Nyelvünk és kultúránk: published in Hungarian. 56. (1984) pp. 63—66.
19. BÉKÉSY, G.: About private financing of research projects. (Manuscript). Békésy Collection, Library of Congress. Washington, D. C. pp. 11.
20. BÉKÉSY, G.: Some biophysical experiments from fifty years ago. *Ann. Rev. of Physiol.* 36. (1947). pp. 13.
21. Certain items from his correspondence and a letter dated October 5, 1948 (signature illegible) originating from a co-worker can be found in the Békésy Collection. ref. 19.
22. WAGNER, F. S.: *Zoltán Bay Atomic Physicist, a Pioneer of Space Research*, Akadémiai Kiadó, Budapest 1985.
23. Interview with Zoltán Bay by Annamária Inzelt. 1986—1988. *Valóság* (1989). 2. pp. 80—92 (In Hungarian).
24. See e.g. *A Magyar Tudományos Akadémia másfél évszázada 1825—1975 — (150 years of the Hungarian Academy of Sciences.)* Ed. Zsigmond Pál Pach. Akadémiai Kiadó, Budapest, 1975. (In Hungarian).
25. ref. 23. pp. 91.
26. SZABÓ, T., ZALLÁR, A.: *Szent-Györgyi Albert Szegeden és a Szent-Györgyi gyűjtemény.* —Albert Szent-Györgyi in Szeged and the Szent-Györgyi collection. Szeged, 1989, pp. 335—341. (In Hungarian.)

Gábor PALLÓ H-1521, Budapest