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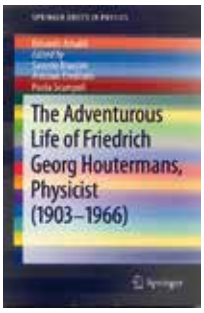

E. Amaldi
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The Adventurous Life of Friedrich Georg Houtermans, Physicist (1903-1966)
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The author of this book, Edoardo Amaldi (1908-1989), was one member of the famous "ragazzi" group of the via Panisperna in Rome where, under Enrico Fermi's leadership, several key discoveries of nuclear physics were made in the 1930's. After the war Amaldi who had become a leading European scientist and biographer was preparing the biography of Fritz Houtermans (FH, 1903-1966) whom he had met at several occasions. When Amaldi died he left a manuscript on FH which remained unpublished for 20 years and only recently (2010) was donated by Amaldi's son Ugo to the Laboratory for High Energy Physics of the University of Berne where FH had spent his final productive years.

FH's name appears in the name index of most science history books of the 20th Century where he is often briefly described as an enigmatic, maverick, eccentric personality involved in the development of nuclear physics from the 1920's to the 1960's. Now at last the present book gathers in one single place a large amount of details to fill in the lifeline of this intriguing character and explains just what were his major contributions to science (several short biographical notes in various forms [1] are available).

Amaldi's unfinished manuscript, mildly adapted, organized chronologically and supplemented with photos and memories of the time by the editors, is presented as a long series of two dozen short chapters of a few pages each, which makes a comfortable, piecemeal reading of the intricate story of FH's life. Quite apart from describing FH's fascinating, turbulent career and family life, this book contains many brief notes about fellow scientists, teachers, collaborators and friends whom FH met during his peregrinations in a Europe in tragic turmoil. Many of the great physicists of the first half of the 20th Century had met FH and remember him not only as a brilliant scientist but especially as a free spirit, endowed with a great sense of humor. As one example, Otto Frisch [2] describes him as "…full of brilliant ideas, with a profound understanding of quantum theory, …" adding the hilarious comment "…very proud of his mother's Jewish origin FH was liable to counter anti-Semitic remarks by retorting: 'when your ancestors were still living in the trees mine were already forging cheques'…". Frisch further mentions FH as being at the origin of calling "the Martians" the unusually brilliant scientists all issued from Budapest in the 1920's including such giants as Wigner, Teller, Szilard and von Neumann. Amaldi and several other sources [1–3] report a tragi-comic incident quite characteristic of FH's mischievous spirit and reckless behavior: as a desperate chain-smoker short of tobacco, in 1944 he ordered (and obtained), on official stationery of the Physikalische-Technishe Reichsanstalt (PTR), special "Macedonian tobacco" to a Dresden cigarette manufacturer for "kriegswichtig" research on light absorption by "fog and smoke" [3].

In the first few chapters, Amaldi explains FH's trajectory as a youth in Vienna and in the 1920's as a physics student under James Franck in Göttingen where he got to meet and interact with the impressive series of eminent theoretical physicists and mathematicians working or visiting there at the time. After his studies he then moved as an assistant to G. Hertz at the Technische Hochschule Berlin until the advent of the Hitler regime. As "half Jewish and whole communist" [2], FH narrowly escaped the Gestapo by fleeing to England (1933). In 1935 he and family moved to Kharkov, Ukraine where, in spite of several attempts by his friends to dissuade him, he was lured by his communist convictions and sympathies to the soviet regime. However there even his sincere communism could not spare him the soviet prisons where he spent several years accused of counterrevolutionary activities and spying on behalf of fascist Germany. Like many of his soviet friends he was forced, under torture, to "confess" fictitious political crimes during the great Stalin purge of the 1930's [4]. Only the infamous German-Soviet pact of 1939 got him out of Russian jails and expelled back to Germany only to find himself in mortal danger again and imprisoned once more in Berlin by the Gestapo, this time as a Russian spy. He was liberated thanks to the intervention of Max von Laue, one of the rare German intellectuals who dared stand up against the Nazis, and who managed to get FH a job in von Ardenne's [1] private laboratory. When Germany invaded Russia FH was sent to Kharkov on an Army mission to collect scientific instruments and information on the Soviet science organization. During his short visit there he attempted to help former friends. In 1944 FH went from von Ardenne's lab to a brief stay at PTR Berlin from which he was promptly fired after attempting to repeat his mischievous tobacco trick. Thanks to the intervention of W. Heisenberg, C.F. von Weizsäcker and W. Gerlach (the then plenipotentiary of the "Uranverein" [5], the official German society for research on uranium fission) he was returned to Göttingen where he stayed till the end of the war and onwards until 1952. He finally moved to his last working post in the Swiss city of Berne where the physics department of the University was in need of renovation. In spite of his considerable reputation FH accepted a professorship in the modest institute (on the partial ground that Einstein began his career in Berne!) and promptly transformed the place into a vibrant international group on particle physics, nuclear sciences and applications to geology!

Scientifically FH kept very busy throughout these eventful peregrinations. Amaldi's book includes a list of about 100 of FH's publications, an impressive number at a time (including the war during which he managed to publish 10 papers) when the publication pressure had not yet reached modern levels. FH's contribution to the physical sciences is wide-ranging but he is remembered especially for three main achievements:

i) His 1929 pioneering work with R.E. Atkinson, investigating the energy production in stars by thermonuclear

fusion, *i.e.* proton capture by light elements, preceding by nearly 10 years G. Gamov's and von Weizsäcker's proposal in 1937 and H. Bethe's Nobel Prize winning work of 1938 on the hydrogen and carbon fusion cycles.

ii) His major war work of 1941 on nuclear fission (including descriptions of slow and fast neutron chain reactions, ^{235}U, isotope separation, critical mass, atomic bomb, nuclear reactors, synthesis of fissionable elements (Pu), etc…) written down as an extensive, unpublished "internal report" of von Ardenne's laboratory but circulated in the "Uranverein". It is not clear from Amaldi's book or from other references [5, 6] who came up first in Europe with the idea of synthesizing fissionable transuranic elements in a "uranium burner", either von Weizsäcker in July 1940 [5] or FH who had completed his first study of the uranium problem already in September 1940 and discussed it with von Weizsäcker and Heisenberg long before the writing of his laboratory report.

iii) His highly productive post war work on nuclear geochronology which he developed at the University of Berne when he arrived there in 1952.

Sometime one finds FH's name cited in the post war controversies about the ethical behavior of scientists who chose or were forced to stay and work under the Nazi regime. In his book, the first on the making of the atomic bomb, Robert Jungk [6] reports on an extensive interview with FH in Berne in 1949 : "… he (FH) and some of his colleagues had debated how they might prevent the great nuclear discoveries from being abused in the construction of bombs….They were determined not to attract the attention of even their closest associates to the possibility of an atom bomb…". In a recent book [7] historian Mark Walker gave this devastating assessment of such postwar claims by German scientists: "When the war was over and National Socialism was gone, the physicists … suppressed the truth, created self-serving myths and legends, and left the telling of its history under Hitler for another day". Self-exculpation by scientists [5, 8] starkly contrasts with F. Haber's statement [9] after the First World War when, under attack for his work on poison gas, he simply wrote: "In war men think otherwise than they do in peace and many Germans during the stress of the war may have adopted the English maxim 'My Country, right or wrong'". At the peak of the Third Reich glory in 1941, while Hitler's panzers were hurtling headlong towards Moscow, the strongly anti-fascist FH conformed to Haber's opinion when, no doubt to save his own head, he worked diligently to produce his dangerous nuclear report. Obviously the latter, rather than being hidden to everybody, was delivered to von Ardenne and discussed with colleagues of the "Uranverein" such as Carl F. von Weizsäcker and Heisenberg. Moreover the report most likely percolated all the way up to Hitler's Cabinet Members "Reichspostminister" W. Ohnesorge, major sponsor of von Ardenne's lab, and Foreign Minister von Ribbentrop, immediate chief of Carl's father, Ernst von Weizsäcker.

Almaldi's book is to be classified in the apologetic category along those of Jungk [6], Th. Power [3] and several others, in which the German scientists are credited as having made what they could to deny the bomb to Hitler. Doubts towards such rosy views arise when reading with an open mind the Farm Hall transcripts [5, 8], that is the secretly recorded conversations between the ten major German nuclear scientists detained at Farm Hall [8], in which one finds hardly any trace of moral qualms. Skepticism about postwar statements, by Heisenberg in particular, is reinforced from reading Niels Bohr's unsent letters to him [10–12] and, at the extreme polemic side, the contemptuous account by historian P.L. Rose [13] in his book on Heisenberg and fellow scientists, including FH.

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