# Finding Doctor Fleck

Essay presented before the Chit Chat Club on September 10, 2019

Michael Thaler

Some 40 years ago, I sat in my lab at the University of California in San Francisco thumbing through that week's issue of the journal Science. As it happened, that esteemed publication reported on my research using pregnant rats with an inherited defect which made them jaundiced and brain-damaged. The idea was to study the effect of an abnormal maternal environment on the development of the affected metabolic pathway in the normal and genetically defective fetuses in the litter. The journal's reviewers saw my experimental design as an "elegant" application of an "experiment of nature" (a pathological mutant) for the investigation of intrauterine development. The reviewers also noted that an additional advantage of the approach was that a parallel experiment using the normal strain of rats provided a perfect control. Best of all, I thought, was that the experiment had produced a clear-cut result. I had no doubt that the data *proved* a "fact" that existed in the "real" world, but I had a lingering reservation about whether a fetus gestating in an "abnormal" mother could be considered as entirely "normal".

Perhaps because I was thinking about the validity of the conclusions that I derived from my experiment, my eye fell on the title of a recently published monograph, "The Genesis and Development of a Scientific Fact". Normally, I would have had zero interest in what seemed like a grandiose and misguided philosophical dissertation on a self-evident truth that had nothing to do with science. As far as I was concerned, a fact is an unfailingly demonstrable truth; it has neither genesis nor development. But the name of the author intrigued me: Ludwik Fleck. The rendering of Ludwig with a **k** is exclusively Polish, while the surname Fleck is either German or Jewish. This suggested that the author might be a Polish Jew, like myself. Indeed, the brief biographical sketch indicated that Fleck had specialized in infectious diseases in the city of Lwow in Eastern Poland before World War II, and had been interned in the Lwow ghetto for Jews when Nazi Germany invaded the Soviet Union in 1941. This information added to my excitement.

I was born in a town just 30 miles south of Lwow. My early childhood had been tranquil and utterly unremarkable until the day around age 5 in the summer of 1939, when I scratched at a mosquito bite on my face. The spot

became infected, and soon my cheeks were studded with thumb-sized ulcers that itched and oozed blood-stained, sticky pus that glued my face to the pillow during the night. My hands had to be bound to the bed posts to keep me from tearing at my cheeks. Each morning, my mother soaked balls of cotton baton in a lukewarm solution of salt, dripping the liquid to soften the secretions that attached my face to the pillow-case. I was imprisoned in my home, unable to play with the neighboring kids, or even have them come near me. On our daily visits to doctor Redlich, our family physician, mothers shielded their children from me in the waiting room. Redlich prescribed various potions and foul-tasting curative "waters" imported from hot springs in the Carpathian mountains, but the infection continued to spread. The doctor finally threw up his hands and recommended we see a specialist in Lwow.

This was my first trip by train, my first ride in a street-car, the first sighting of the palatial edifices from the Austro-Hungarian era, grotesquely decorated with statues and animals that projected from their walls and cornices. I remember the blindingly white doctor's office, and the remarkably large head of the man in a white coat who strode briskly into the room, pulled on rubber gloves, and peered down at my face through thick lenses set in heavy black frames. I remember most of all the shiny umber-colored tube the doctor handed my mother, embellished with the word *"Granugen"* in cursive script that snaked down its side. Mother was to apply the ointment on the affected areas each morning and evening. My nostrils still cringe from the smell of the pasty yellow-gray worm that flowed from the tube. It reeked like the smoke from the sulfurous tips of wooden matches, and like rotten eggs. Sulfa!

Within days, the ulcers began to dry and the pain and itching receded. Within weeks, my face cleared of dermatological debris. Within months, the staccato wail of diving planes filled the air by day, and the growl of distant artillery from the east disturbed our nights. World War II was in progress and my childhood had ended.

I called my mother in Toronto from my lab. "Do you recall the name of the doctor in Lwow we visited for my facial infection when I was five?". "Are you out of your mind?", she responded, "that was 40 years ago! By the way, what's a facial?". "Ma, can't you remember anything about that time?", I pleaded, "Anything at all?" Hesitantly, she offered, "I think the doctor's

office was on Lyszakowska street. I bought a hat near there after we left the doctor." One week later, my mother called back. "Listen," she began, as she always did when she wanted me to pay close attention. "I asked Roma about the doctor." Roma was a close friend, a fellow Holocaust survivor and a *landsman* from Lwow. The only infectious disease specialist she recalled from Lwow vaccinated people against typhus in the ghetto. His name had something to do with stains. A stain in Yiddish is a *fleck*. But was this the physician who had given me back my childhood, however briefly, and was the first to save my life?

I ordered Fleck's book, a slim volume of some 150 pages. Published in 1979, this was the first English translation of Fleck's treatise, originally released in German by a small publisher in Zurich in 1935, in an edition of 640 copies, of which about 200 had been sold. Given that all works authored by Jews had been banned in Nazi Germany, it was a wonder Fleck managed to publish his work anywhere in the German-speaking world.

In the Preface to the English edition, Thaddeus Trenn, the co-editor and co-translator, recalled he had come across Fleck's original volume in Harvard's Medical Library in 1973. It had been checked out only twice before, in 1949 and 1950, by the same reader. That was Thomas Kuhn, whose hugely successful "The Structure of Scientific Revolutions" had appeared in 1962, making "paradigm shift" a household expression. In his very brief Foreword to the English translation, Kuhn acknowledged his debt to Fleck. He wrote, "Fleck made me realize that the problems that concerned me had a fundamentally sociological dimension", and "I was excited by Fleck's remarks on the difficulty of transmitting ideas between two 'thought collectives' ".

The concept of a "thought collective" is central to Fleck's theory of scientific discovery. Fleck maintained that "thought collectives" of experts determined the nature of a fact. Each collective possessed its own "thought style" or *Denkstil*, which in turn was conditioned by cultural-historical factors. Thus, scientific "facts" were subject to constant revision and "development". Reading Fleck, I wondered, was the definition of "normal" in a fetus inside the uterus of an "abnormal" rat a fungible fact?

Recognition of Fleck's seminal contribution to the sociology of science has grown exponentially since 1979, and some scholars are of the opinion that Kuhn, whose book sold in the millions and earned its author world renown,

borrowed much from the obscure practitioner in Lwow. Trenn writes in the Preface: "The relevance of Fleck for current research was so overwhelming that I decided to bring out an English edition." Since then, a Fleck Center for the Sociology and Philosophy of Science has been established in Zurich, dozens of scholarly treatises and hundreds of analytical articles (ironically, many in Polish) have been published about his theories, international conferences are devoted to his work, and the top prize for the best achievement in medical and general sociology is awarded annually in his name.

Fleck anticipated the currently fashionable idea that scientific understandings are shaped by their cultural and historic contexts. In a nutshell, Fleck originated the first sociological investigation of the production of scientific knowledge, a new way of looking at science, viewing it as a collective activity subject to error, much as any other human endeavor. He regarded scientific production as the work of "thought collectives", not individual geniuses, because the thoughts of an individual are shaped by his community of co-scientists, and by the broader demands of society.

Who was Fleck? And how did he come by his theories? The answer to the second question remains elusive, buried deep in Fleck's character and his own 'thought collective'. Here, I focus mainly on the narrative of Fleck's life and times.[1]

Fleck was born in 1886 in the imperial city of Lemberg, later dubbed, in turn, as Lwow in Polish, Lvov in Russian, and presently Lviv in Ukrainian. At the time of Fleck's birth, the city was the capital of Galizia, a province of the Austro-Hungarian empire. Lviv is now in the Ukraine, located near the western border with Poland. Fleck received his MD degree from the University of Lwow, then worked for 3 years on the production of a vaccine against typhus in Rudolf Weigl's laboratory in the Lwow University Bacteriology Department headed by Weigl. Weigl greatly appreciated Fleck's talents and intense commitment to research, and repeatedly attempted to secure a faculty appointment for Fleck, but failed each time due to resistance from the administration and faculty against the admission of a Jew to their ranks. Fleck managed to secure an appointment in 1925 as

[1] A detailed and extensive account of Fleck's biography and research is in Arthur Allen's "The Fantastic Laboratory of Dr. Weigl", Norton & Co., New York, 2014

director of the clinical laboratory at the Lwow State Hospital, but was forced out two years later by anti-semitic superiors who invoked "personality issues". After a year spent in Vienna on immunological research, Fleck obtained a position as chief of the bacteriology lab at the Social Sick Fund in Lwow, only to be dismissed in 1935, when the Polish government passed a law banning Jews from all upper level public positions. Until the outbreak of World War II, Fleck supported his family and his research with private practice. After the Soviets occupied Lwow in September, 1939, Fleck was appointed director of the city's Microbiological Laboratory and finally gained a faculty position at the State Medical School in Lvov.

Nazi Germany conquered the region in the summer of 1941. Fleck, along with wife Ernestine and son Ryszard were herded into a closed ghetto together with the 150,000 Jewish inhabitants in Lwow. Working in the Jewish hospital, Fleck developed original methods for early detection of typhus and a novel vaccine derived from antigens extracted from the urine of patients in the acute phase of typhus. This extremely infectious disease was carried by lice, hence was referred to as "the Jewish plague" by Nazi medical authorities. Typhus decimated the ghetto population and coincidentally wreaked havoc among the German divisions on the Russian front. Learning about Fleck's vaccine, the Gestapo demanded an explanation from Fleck whether the vaccine would also work on Aryans. According to two witnesses who survived the war, Fleck understood perfectly the immense significance of the issue from the perspective of the Nazi *Weltanschauung* (world view) and immediately reassured the SS-men, "Of course the vaccine will work on Aryans, but it must me made from Aryan and not Jewish urine." The operation was moved into a former pharmaceutical factory outside the ghetto, where Fleck was compelled to explain the procedure repeatedly to medical specialists from Berlin and other parts of the Reich.

The vaccine was finally ready to be tested in humans by mid-1942. Fleck vaccinated himself, his family, two volunteers in his laboratory, and about 500 inmates of the notorious Janowska camp; all were eventually "liquidated", leaving the question of the effectiveness of his vaccine unresolved. In February, 1943, with fewer than 50, 000 Jews remaining in the ghetto, Fleck, his wife and son, and 7 other members of his entourage, were jailed for several days, then deported to Auschwitz. After recovering from a relatively benign bout with typhus (he attributed the mild course to his vaccination), Fleck worked in the bacteriology research institute in

Auschwitz and transferred in mid-1944 to a vaccine research unit in the concentration camp in Buchenwald, to head a group of typhus researchers assembled by Nazi medical authorities from France, Czechoslovakia and Holland.

Their task was to prepare an anti-typhus vaccine using *Rickettsia* organisms propagated in the lungs of infected rabbits for use by elite SS troops on the Eastern front. Only after the war did a closely kept secret come to light: under Fleck's direction, the group sabotaged the project by manufacturing inactive vaccine under the nose of a Nazi party hack medical director (Fleck later described him as a "dumbbell"). The fake vaccine was sent to the Russian front, along with miniscule amounts of active vaccine for use as controls for allergic reactions to rabbit proteins in the "vaccinated" soldiers. Meanwhile, active vaccine was given to prisoners in the camp exposed to the dreaded disease which carried a 30% mortality.

Fleck was finally reunited with son Ryszard in January 1945, having searched for him in a convoy of starving, exhausted prisoners who had survived the "death march" from Auschwitz to Buchenwald. At the end of the war in early May, Fleck returned to Lwow to find Ernestine, who had survived the women's concentration camp of Ravensbruck. Ryszard was drafted by the Red Army immediately after liberation, and forced to remain in Germany for several months. He eventually made his way back to Lwow, discovered the whereabouts of his parents in the Polish city of Lublin, but left for Palestine on the historic vessel "Exodus" in 1947.

The Communist regime in Poland appointed Fleck to several important university posts in Lublin and Warsaw where he pursued and published articles on clinical and basic immunological questions, and testified as an expert witness at the Nuremberg trial against I.G. Farben in 1948. Having suffered a heart attack and diagnosed with Hodgkin's lymphoma in 1957, Fleck and Ernestina left Poland to join Ryszard in Israel. He continued his research on immune mechanisms as head of the Experimental Pathology division at the Israel Biological Research Institute in Ness Ziona, a secret installation dealing with military applications of bacteriology located near the Weizmann Institute in Rehovot. He died of a second heart attack in 1961, one year before Kuhn published the blockbuster tome which eventually opened the gates for Fleck's journey from obscurity to international

recognition. He never returned to his ground-breaking foray into the philosophy and sociology of scientific discovery.

I continued my efforts to discover the identity of the specialist who had treated and cured me just before the war. In 1985, contacts at the Weizmann Institute led to Fleck's co-workers at Ness Ziona with whose assistance I traced Ryszard to the town of Petach Tikvah (or the Opening of Hope), on the outskirts of Tel Aviv. We met in his modest apartment while he was on leave from his job as a lab technician for Israel's National Sick Fund. Ryshard (or Arieh in Hebrew, as he now preferred to be called) was convalescing from his first heart attack at age 61. His mother, Fleck's widow Ernestine, welcomed me at the door in Lwowian-accented Polish, and quickly left me with Arieh. We conversed in this language we shared, as he knew no English and I struggled with rudimentary biblical Hebrew. He seemed eager to discuss his trajectory before, during and after the Holocaust, constantly in the company of his father until they were separated for six months when Fleck was moved from Auschwitz to Buchenwald. After about 2 hours of uninterrupted discourse, Arieh began to weaken visibly and I stood up to leave. As I headed out, Arieh handed me a small cardboard binder with "Reminiscences, 1924-48" scribbled in Polish on the cover. "Take it and do with it as you please" he whispered as his elderly mother came back to shake hands with me. "Do I understand you are giving me the only copy of your memoir?" I asked, incredulous. "Yes," he shrugged, "I translated it into Hebrew for my private use, and have no further interest in the Polish original…".

His son's perspective and details of Fleck's story which remain untold may shed light on the mystery of how and why Fleck, untrained as a historian or philosopher, took time off from his all-consuming pursuit of medical research to come up with humanistic theories considered foundational in current perceptions of scientific creativity and factuality. This remains a daunting responsibility I have managed to avoid during the intervening years. But by filling in a small yet crucial detail in my own 'genesis and development', Richard's memoir yielded definitive information about Fleck's crucial role in my own story. On page 86 of his closely typed and hand-corrected manuscript, Ryszard describes his tortuous return from Germany to Lwow, to reunite with his father and discover the fate of his mother. He heads

for his pre-war home at 34 Lyczakowska Street, the destination of our visit in 1939 according to my mother's hazy memory.

Two weeks ago, on August 28, I am again in Lwow, now Lviv. My daughter and son have brought me back to my birthplace in the Lviv district after an interruption of 80 years, an intergenerational pilgrimage into the darkest past configured as a birthday present. Yesterday we stood at the mass grave in the abandoned Jewish cemetery where the bones of my grandfather, three uncles and aunts, and their 5 children lie with the 2,500 last Jews of Berezhany executed during the final "Judenrein Aktion" on June 8, 1943. A depression in the ground marks the spot, covered with an impenetrable tangle of bramble bushes and weeds. Leaning on the stumps of tombstones with eroded Hebrew lettering scattered helter-skelter over the steep hill I had once climbed up and down a lifetime ago, we recited the mourner's Kaddish, and left for Lviv.

Next day, bathed in the soft light of early morning, we thread our way through Lviv's imperial boulevards and gleaming malls abuzz with tourists. Lviv is undergoing yet another invasion, by armies garbed in fashionably mutilated jeans and leathery miniskirts and armed with smartphones that direct them to overflowing restaurants and high-end shops. We climb the 408 steps to the panorama atop the 18th century City Hall tower. Confirmed by Google maps and my binoculars, I locate Lyczakowska street off to the northeast of the massive Opera House. Turning into the street, I recognize the 3-story building from a block away. An inconspicuous bronze plaque announces in Ukrainian that this stolid residence once served as the home, office and research laboratory of Doctor Ludwik Fleck, eminent physician, Holocaust survivor, saviour of many lives. I can at last count myself among them. And *that* is a fact.