

The Story of a Booklet-Writing by a Young Academician at a Legal

Medicine Chair

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Abstract: This article is basically the story of the writing process of a booklet on toxicology at the legal medicine department of a faculty of medicine. With a view to postmodernist considerations; the article depicts which motives may drive a young individual in his attempts to realize a scientific activity while it also verifies that scientific interests are of a selective nature and are closely related to personality and former life experiences. At the end of the article the mentioned toxicology booklet is also roughly introduced.

Key words: legal medicine, poison, poisonous, toxicology, scientific curiosity

1. Introduction

The work titled "General Toxicology" (in original Turkish version "*Genel Toksikoloji*") was completed at *Çukurova School of Medicine in Adana, Turkey* at the Department of Legal Medicine (at the time, the Chair of Legal Medicine) and duplicated and bound at the printing office of the university. The head of the chair had urged me for such a work at the very first days of my joining the academic staff. He talked to me about the significance of keeping notes in a consistent manner and asserted that the accumulation of such notes would constitute a preliminary base for a book and this might even be regarded as a usual method for realizing many scientific works.¹

2. Personal Experience in Getting Poisoned

I had applied to the entrance exam for the vacant academic post while working at my former occupation. This former occupation was chemical engineering at a state-owned pulp and paper plant. My responsibility was the cooking phase of the process, which essentially consisted of saturating bits of reeds and straw with caustic soda and obtaining a dough-like mixture in a gigantic vessel.

The plant was very new. A separate technical safety unit (like in the artificial fertilizers installations at *Kütahya*, my summer training factory) did not exist. So; in a sense; each operational engineer had a twin

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¹ Our boss, late Prof. Dr. *Vedat F. Belli*, was an associate professor at the time. He was teaching the course of Legal Medicine to all medical students. His origin being psychiatry, such topics were a bit weighted in his class notes. My draft pages were reviewed by his friend Microbiology-Professor Dr. *Erol Akan* before publication, upon his request. Late professor Dr. *Firuz Baysal*, head of the Chair of Pharmacology and another friend of my boss, also provided support for this venture of mine.

Besides the Course of Legal Medicine, my boss was also the unique instructor of the Course of Medical History and Deontology at the faculty. During informal conversation sessions at the chair, his emphasis on interesting medical phenomena in history (like the poisoning of Rasputin in Tsarist Russia) especially compelled my enthusiasm for research.

responsibility for the safety of his own unit.

The cooking-boiler was virtually a tower-formed reactor-vessel² equipped with sophisticated instruments of all kinds. Along the tall cylindrical lateral face, at certain points pressurized cooking liquor (rich in caustic soda) was squirting or bluffing out and falling down from heights, at times. One morning, I had my share of this burning and corrosive stuff splashing downwards like a sprinkling rain.

The fine droplets hurt my face and my hands and they partly pierced the tweed-cloth of my blue engineer work-coat. Trying to wash away the sticky and slippery basic liquid under running water did not help much. Then I remembered my oranges at the company bachelor lodging. I ran all the way to my dwelling, took and cut one of the oranges at the table. Then I rubbed all my burning points with those juicy hemispheres, thoroughly. Oranges have low pH values; they are acidic. My remedy against the damage of bases was just that weak acid in those fruits to get a neutralization reaction.

A mechanical engineer, a late-sleeper, happened to see all this and, lacking such basic chemistry knowledge, he retorted in a touchy voice: "Good, fine! But, why don't you teach such precious knowledge to us, your colleagues, also?"

A few weeks after this incident; one night I headed for my unit to check on the night shift. Then I indulged in some technical reading in my room. At a certain point along the course of my pensive reading, I felt the pungent, biting odor of chlorine in my respiratory system. Chlorine³, which carries the bitter memory of being the first war gas of modern belligerence, used to be employed at the adjacent unit, to bleach the naturally-dark cellulose paste. So, this happening meant a leakage of chlorine. I began to walk towards the steel staircase at medium pace⁴. I reached the watchman-cabin in an awful situation, shaking all over.

My eyes tearful, my chest aching with a narrowing-feeling, I got hold of the phone with the agony expression on my face, which terrified the watchman himself. With a fitful voice I got in contact with the night foreman in charge, ordering him to escape immediately. With a calm voice he replied that he and another laborer were in the command panel with their masks on and there was no danger for them. I felt a relief for their sake, returned to my bachelor lodging and tried to get some sleep. The psychological impact⁵ would last for a few days more.

3. A Summer-Training with Toxic Substances

Before my senior undergraduate year, I had won a three-month-long summer training at Basel at a well-known chemical plant, where I had worked with poisonous compounds. I had passed the first half of the

² I was proud of my unit, which represents the most technical and important phase of the production in a pulp and paper industry. I even wrote a "pretty ditty" (as an expatriate authority put it) in English, addressing to this boiler:"With thy/Fifty two-meter-high/Magnificence/You are the pride/Of this pulp-and-paper plant!/Our unit you are!/Our skyscraper!"

³ During the First World War, a pressurized chlorine cylinder thrown at the allied forces by the Germans on April 22, 1918 was later followed by other yellowish green death clouds. Chlorine is colorless in small concentrations but assumes this color when concentrated. Still later, masks were developed as a precaution (summarized from Sisson 1955).

The retention time of poisonous gas is longer in hollow places then in plain surfaces. Some new soldiers in deep trenches used to see their fellow soldiers up there removing the burdensome masks and follow their examples, vomiting out their lungs. Such a scene is depicted in one page of the superb novel All Quiet on the Western Front [*Im Westen nichts Neues*] by *Erich Maria Remarque*. The working principle of a gas mask is simple. Air consist of 78% nitrogen and 21% oxygen by volume. Both elements have small atomic weights with respect to higher atomic weights of toxic gases. Air escapes through the pores of the mask-filter, while toxic gases get tangled.

⁴ Moving fast in chlorinated environment induces deep breathing and increases the danger. On the other hand, slow motion elongates the exposure time (Klor Kullananların Uymak zorunda Oldukları Güvenlik Kuralları [Safety Rules for Those Using Chlorine]).

⁵ The related literature notes that chlorine (Cl_2) poisoning leaves no known irreversible effects on the survivor. But; at the time, I was not aware of this knowledge and I was accordingly fearful. S.Ç.

period at the section where dye-research was going on. Generally all color-giving chemicals are strongly toxic.

During the second half of the period I had been assigned to the pharmaceutical research section with a mini project entirely under my own control. A khaki colored fine powder⁶ was to be fluidized in a complicated glass apparatus by the circulation caused with a small pump in a methanol environment. This would lead to a continuous extraction. Since methanol is a very toxic alcohol internally and externally; I had to be extremely cautious⁷.

4. The Concept of Toxicity at the University Chemistry

At *Bosphorous* University in a Quantitative Chemistry Laboratory session we were making experiments by heating bromine salts in test tubes over the flames of Bunsen burners. Our instructor witnessed concentrated bromine vapors around. He cancelled the experiment and took us into a normal classroom, to go on with a theoretical session. He then mentioned about safety officials in laboratories in highly developed countries.

He mentioned about diverse and selective effects of toxic substances on the human organism. Some poisons would go settle in kidneys; some others would enlarge the spleen; some would essentially work on the brain! Now; in pure Chemistry textbooks; this aspect of chemicals were passed under silence. This was my first introduction to systemic poisons. I believe that some other students' intellectual curiosity regarding poisons was also stirred then.

Sometime before that, another instructor of ours said interesting things about the accumulation of DDT and detergents in nature; but it was not as horrible as hearing about acute poisoning.

Still another instructor, in the course of Qualitative Chemistry, had said a few witty words a month ago about the gas hydrogen cyanide:"One should not breathe HCN readily! Or else you might remark that it scents like almonds and those may be your very last words!"

5. Poison in History & in Child Fantasies

We read in primary school History books that Carthaginian King Hannibal swallowed poison after his defeat by the Romans and Ottoman Sultan *Bayezid the First* (nicknamed The Thunderbolt) did the same thing after being captured by *Tamerlane. Mehmed the Conqueror*'s son Sehzade *Jem Sultan* got poisoned in captivity. Napoleon⁸ got killed as a result of chronic poisoning. We watched in historical movies that some tribes poisoned the water sources⁹ prior to their withdrawal before the invading forces. We knew that the Byzantines (East Romans) had a powerful incendiary weapon for defense: When they were besieged, they used to employ Greek fire onto the enemy armies from behind the city-walls. From comic strips we were aware of the fiery arrows of North American Indian tribes.

My mother used to follow with enthusiasm a serialized historical novel about Theodora (500-548), the wife

⁶ The name of the powder had been a commercial secret. As a matter of fact; the firm was in severe competition with a few rival ones and possible industrial spying was a constant nightmare. Once my boss jokingly said to me:"It is good that you do not know German; here, all the secrets are written in German" (I was to learn German long years afterwards).

⁷ Let us remind for the layman that the alcohol in beverages is ethanol (ethyl alcohol). The formerly commonly used cheap blue spirit was also ethanol but before landing on the market it was denatured (spoiled) by mixing with methanol (wood alcohol) in order to prevent its abuse by drunkards.

⁸ Napoleon gave a tuft of his hair to his aide-de-camp at Elba Island. The aide-de-camp later got married to a girl from the palace and the hair came to this day. Modern neutron-activation techniques applied to a 13-cm-long hair sample revealed that Napoleon got fed with arsenic. The toxic element was not given regularly; sometimes the dosage was much higher than other days (from graduate class-notes of Cengiz, 2005).

⁹ Such a scene was presented in a movie adapted from the historical novel of *Gustave Flaubert*, Salambo.

of a Byzantine Emperor. In one episode which she summarized for my sake; the seductive empress orders a sorceress to smear the Virgin Mary statue in the cathedral with a special powder, beforehand. Then her mother-in-law kisses the statue as usual in worship and she "kicks off" as soon as she drinks some water later on! The young bride then takes the water bowl away from the dead woman's hands and drinks up the rest of the content, herself. She survives and gets acquitted from any suspicions in the mind of her husband, powerful Justinian The First! [As a matter of fact; highly soluble salts of cyanide CN-dissociate in water completely, setting the poisonous anion free. A water-insoluble compound of the same cyanide-radical would not display toxicity, at all].

Beautiful Cleopatra (played by Elizabeth Taylor) is discovered lifeless at the end of the historical movie while an asp (a very poisonous snake) crawls out of the place. She had taken her own life in such a pathetic manner, alas!

Allusions were made in some short stories to certain African natives who expose themselves to specific snake poisons in small doses, incrementally increasing the amount¹⁰ and finally achieving full immunity. [Indeed; one can theoretically develop tolerance against some organic toxins but not against heavy metallic poisons or radiation, for instance; in the latter case; accumulation only quickens the fatal end].

In many fairy stories; in exotic, mysterious eastern palaces; intriguing damsels concealing liquid-containing phials in their bosoms and court tasters¹¹ trying sultans' meals before His Majesty himself, used to constitute exciting familiar motifs and at times even preoccupations in my child imaginations.

6. Intellectual Curiosity and Personality: An Interest for Human Factors

While the personality of any scholar gets reflected on social sciences more intensely; it does not spare natural sciences entirely, either.

A civil engineering instructor may be more inclined to ask questions about hydrostatic pressure. A physicist may display an obvious interest in optical topics. In fact, special studies are shaped according to such interests. One might even talk about young researchers who indulge in certain fields of study just due to their admiration felt for former teachers or instructors

Even in carrying out the work of a scientific project; the human traits of the researcher impacts on many aspects of the development process. Professor *Tan* (CBT 1997) mentions about his physiology doctorate dissertation advisor in Germany in the following wording: *My advisor Professor J. Haase was too harsh. He would not forgive the smallest mistake in experiments. He would never say "good, well-done" but would just keep*

¹⁰ The legend goes that a certain *Mithridates* (there are six kings with that same name) among the ancient Pontus rulers at Black Sea deliberately got used to both arsenic and strychnine. In English class in high school we read a poem dealing with that topic. The last stanza ("Mithridates, he died old") got embedded in my memory. While writing this article, I made a research and attained the full poem. The title is: Terence, This is Stupid Stuff. The poet is *A. E. Housman* (1859–1936).

¹¹ The booklet itself was to be dedicated to all bygone chief tasters of the Ottoman Palace, for that matter. It is interesting to note that in today's modern Republic of Turkey the tradition lives on in the military; but the aim is reversed. The former tasters also served the purpose of protecting the sultans from food poisoning as well as evaluating the value of the food as a gourmet connoisseur. In today's army the chief cook presents the menu firstly to the Commandant. He takes a spoonful from each sample meal and endows his approval, considering it worthy of his soldiers, before any other personnel devours that food. In a way, he also imparts a blessing onto the soldier's food.

Late journalist, world-famous *Mehmet Ali Birand*'s excellent book giving an anatomy of the Turkish military (The English version is titled Iron Shirts) starts with such a food-tasting episode by a commander and carries the comment "I did not know that the commander himself is the guinea pig in a military unit!" (The author's surprise comes from the fact that he had been exempt from conscript in his youth, due to health problems).

silent when approving something. For him figures and drawings were very important. He had fired the female technician because of that reason. My scientific personality or even my entire personality developed under his close surveillance.

Tan specifies that his post-doctoral advisor was just the contrary: Professor *Henatsch* was a tolerant, mild-mannered person; who would not interfere with the experiments and allow for a lot of freedom. He would sometimes watch the experiment and provide brief but significant hints (ibid.).

Maybe my interest in poisons could be attributed to the most direct interaction of chemical reagents with the human organism via getting poisoned by those reagents. Human figures, human behavior and human attitudes have always been of prime importance for me. (My later education would indeed shift to social sciences).

As a little child, I used to draw human figures and display almost no interest in *naturmort* or other *tableaux* depicting sceneries. I never liked instrumental music but always thought of human voices when it came to music. A sentence on the back cover of a record of American folk singer *Pete Seeger* was very striking for me. It said that for the performance of this music only two things were required: A banjo and a true, untrained (!) voice. On the back cover of a long play by *Ruhi Su* (the Turkish equivalent of the unforgettable black American singer *Paul Robeson*, according to some critiques) again, late author *Sabahattin Eyuboğlu* wrote that *the human voice itself is the most noble one among all musical instruments*!

7. Debate and Conclusion

As a result, the above-mentioned General Toxicology booklet emerged under rather difficult conditions at an Anatolian Faculty of Medicine, from the pen of a young assistant, who sought shelter at cheap hotels at nights. In accordance with the common duplication techniques prevailing in 1980s, the pages got first typed on wax-paper. Travels were undertaken to *Ankara* and *Istanbul* (from the more provincial city of *Adana*) to enrich the bibliography. Footnotes about poisoning incidents were added to capture the reader's attention. A fluent and lively language style was employed.

The work also aimed to free the reader from false myths¹² on poisons (e.g., the section with the subtitle "About the Legend of Saltpeter [in food]" deals with such a wrong common conviction in the section about the Toxicology of Foods and Food Additives). Related poems and epigraphs were inserted (One such poem carries the title "to Typhoid Mary").

At the time the booklet was welcome with deep interest at *Çukurova* University, which was not a necessity in the least for the author himself (They asked French thinker *Montaigne* (1533–1592) why he took so much trouble to write down so many pages, which would solely come to the attention of very few readers. He replied that few readers are enough for him. Even one reader is enough. Even no reader¹³ is enough! This is narrated by *Alphonse*

¹² Regarding toxic substances, depending on the prevalent culture of the involved country, false beliefs and misconceptions are quite common. For instance; in American society; when it comes to narcotics; completely false sayings like "I can try it and then quit it, a decisive person can safely use drugs, marijuana cannot be worse than alcohol, one gets his first drug from a seller" are all in existence (Drugs & You, 1981).

¹³ Author Sait Faik says similar things in one of his mostly-autobiographic long story, about the internal need to put things on paper in writing. The protagonist of the story is a middle-aged man, a penitent, who had returned to his island following countless adventures, just as the Prodigal Son — *enfant prodigue* in French in the original Turkish story — had done so. He regards everybody else as being spiritually cleaner than himself, now. He also vows not to write anything any more. Then one day he witnesses an injustice. Upon returning from a prosperous fishing excursion, the eighth person in the open boat is given no share whatsoever from the bounty. This is a young, sickly looking, smiling new-comer-to-the-group. Moreover, all islanders with the exception of one man in the tea-house tolerate this happening, mutely. The ambition and the given-up writing habit of the hero is aggravated all of a sudden.

Daudet in his biographic short story *Poet Mistral*. The story is an eulogy by *Daudet* for his friend *Mistral*, who insists on writing in the Latin-weighted language of *Provence*, which had already begun to fall in decline from the mid-nineteenth century onwards).

Today, the face value (the contained knowledge itself) of that toxicology booklet must, of course, have long been surpassed by other superior works. Nevertheless, the mere story of the emergence of the work should indeed be interesting; because it demonstrates that even in the field of natural sciences, the working motivation depends upon the personal affinities and interests, which in turn are, in a sense, embellished with human feelings. Maybe the perseverance of the author — if I do say so myself — could also serve for a role model for young academics.

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Supplement: A Superficial Presentation of the Booklet's Design

Genel Toksikoloji [General Toxicology] consists of 79 pages besides the beginning pages (dedication, contents, acknowledgment, foreword) and the bibliography. It contains the following sections: Introduction (The definition and history of toxicology); Branches of Toxicology: The Toxicology of Medicaments (A subtitle in this section is *Drugs and Suicide*); The Toxicology of Dependence Producing Matters (subtitles in this section involve Marijuana, Opium, Heroine, Ethyl Alcohol, Tea-and-coffee Fondness); The Toxicology of Foods and Food Additives (two subtitles respectively involve Artificial Sweeteners and The Legend of Saltpeter¹⁴); The

He runs to the tobacco shop to buy paper and pencil, sharpens the pencil with his pocket-knife and indulges in writing [like a grapho-maniac]! The story ends with the sentence "I could have gone crazy if I had not written!" The need to write is such an impulse at times! S.C.

¹⁴ In some total institutions [like garrisons, boarding schools, orphanages, prisons] the gossip goes that alum (in Turkish sap) is mixed into food to break the male sexual desire. Because of this wrong belief some inmates get reluctant to consume the freely offered meals. This is a false idea. Moreover; alum does not have such a property. When alum $\{(AIK(SO_4)_2.12H_2O), aluminum$ potassium sulfate dodecahydrate, or aluminum potassium sulfate with the attachment of twelve crystal-water molecules} is taken into the digestive system, it exerts toxic effects even though those effects are not so intensive. In the related literature it is registered that in two separate cases death had resulted due to the intake of 30 grams of alum by two individuals. The reason could be interpreted as

Toxicology of Pesticides; Industrial Toxicology (a subtitle is *A Few Words on ppm* [parts per million]); Environmental Toxicology; Accidental and Random Toxicology; Military Toxicology; Radiation Toxicology; Forensic Toxicology (successively given subtitles are *Useful Hints for the Detector-Scientist, Internal Visions and Smells in Autopsy, Techniques of Analysis, General Screening Tests, Toxicology and Law*); Classification of Poisons; The Structure and Chemistry of Poisons (a subtitle is *Similarity in Chemical Structures*); Ways of Influence of Poisons into the Body; The Physiological Activities of Poisons (subtitles are *Poisons and Hormones, Poisons and Metabolic Cycles, Poisons and Enzymes, Practical Uses Arising from the Discovery of the Action Mechanism*); Drugs and Cognitive Function: Hallucinogens and Psychosis; The Power of Poisons (two subtitles are "*Getting used to*" *Poisons or Tolerance Development, Synergism and Potentiation*); Some Statistical Results; The Remedies of Poisoning Cases; Protection from Poisons (successive subtitles go as *Ways of Protecting Oneself from Food Poisoning, Measures against Toxic Accidents, Measures for Hindering Suicidal Poisoning Cases, Measures for Prevention of Carbonmonoxide Poisoning, Sparing Oneself from the Sting of Insects, Wasps and Bites of Snakes*); Bibliography.

Two Exemplary Verses from the Booklet (as Translated into English)

FOR TYPHOID MARY¹⁵ — immunology in verse —

If you were my contemporary, I'd go ahead and search you, And then do employ you In the heart-h of my kitchen! I am a man of good tastes, And moreover, I like your name, Mary! No! No! do not ever say such things! Interrupt not my offer: "Is it really worth to die For the sake of a pie Delicious as it may be From the hand of me-Mary?" There are things you don't know! Vaccination's invented Against typhoid fever now! Once I had such a shot; Why should I not appreciate Your master cookery, Which you performed so wisely? You know, Mary, In my house, Those horrible officials From the Health Department

the formation of corrosive sulfuric acid following the hydrolysis of alum. A parallel gossip in the American Military is the common allusion to saltpeter {potassium nitrate, KNO₃} in meals. (Saltpeter is a raw material in the production of black gunpowder). This situation involves jokes whereby new recruits are deceived by the veterans. (I remember that in a funny movie starring the actor George Scott, the hero just out of the prison makes verbal references to saltpeter, all along). As for the toxicity of saltpeter; it is not very probable to get poisoned by many potassium compounds [cyanide salts excepted!]. Potassium compounds, once absorbed, are quickly excreted from the body via the kidneys. Moreover; high doses of such substances cause vomiting, anyway (Çaya, 198, p. 18). ¹⁵ Her complete name is *Mary Mallon*. In 1907 she was officially identified as a carrier of typhoid [who herself does not get sick]. Insisting to work as a cook under phony names in restaurants and houses, she continued to propagate the epidemic (paraphrased from

Couldn't lay a finger On your precious person! You would not feel forced now To change that nice name of yours! s.c.

Pedigrees

-Medical History in verse -My wife's lineage is noble. They have at least a colonel, Besides a rich landowner; As far as I can recall. If you ask my ancestry; My grandmother's ma Was a nurse in hospital. ("Asylum" let us say To be more specific. At the times, you know, A lot of euphemistic Words were not yet coined, at all). Patients bit that great nurse Six successive times a year ! At the time they did not have Anatoxin as remedy. They only had one choice: Tetanus serum¹⁶ it was. Every time a necessity Providing some passive Immunity, which only Was some better than nothing. Serum sickness did occur! Wiped her off this low earth! As for her good old spouse; Grand-grand pa of mine Was a guard in prison. He died of smallpox. A placard on the gate; Yellow pennons all over; The house was quarantined. Fumigation was applied. How did ever the malady Knock out that Spartan, Superhuman physique? A few years beforehand, A revolt had occurred

Encyclopedia Americana, Vol. 27, p. 323).

¹⁶ In former times, tetanus serum used to be employed against the danger of lockjaw in each particular case. This medicament was providing temporary passive immunity. In psychiatry clinics medical personnel bitten by the patients were relying on this cure. But; successive administration of tetanus serum could cause the very irritating serum sickness. After the discovery of the anatoxin [mainly research by Louis Pasteur (1822–1895)] a strong, durable immunity development was made possible (re-translated from the Turkish

In the dungeon, somehow. An unruly convict Had stabbed him ten times! And he didn't give a damn! Just a fortnight of bed rest; Proved to be sufficient To return him to office! S.C.

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