

From *Analitika Protera* till today - an outlook to the Centennial of our Chair

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It is really amazing how old is the idea of analyzing something and making decisions based on the analysis. We, chemists, should be proud to state that the term "analytics" comes from the ancient Greek language (meaning "solvable" or "to solve") and is used in the works of Plato and Aristotle. Of course, their interpretation of "Analitika" has nothing to do with the modern understanding of the word. However, we surely could transfer with sense of satisfaction the spirit of the Aristotle's work *Analitika Protera* to the beautiful and colored world of the analytical chemistry (analytics) of the present day.

On one hand, it is not the proper time and place to try to discuss the role of Aristotle's remarkable work but, on the other hand, why not mentioning the basic goals and achievements. For me personally, they have maybe more close relation to our special hundredth anniversary than assumed. In his *Analitika Protera* the great philosopher explains in his unique and genial way the backgrounds of reasoning, shows what the scientific method is and how significant is the role of logic in the whole process of reaching knowledge about the world around. Thus, Aristotle successfully discovers the sense of reasoning or the way of explaining facts and making logical conclusions. With other words, he defined the role of investigating, studying the facts before reaching logical solution or *epistemon* (in Greek language).

But what has it to do with the analytical chemistry and, respectively, with our present jubilation? I am deeply convinced (having in mind the opinion of many renown analytical chemists and my humble experience the field) that the major goal of the modern analytics moved during the different stages of development and excellence of our science from simple "solving" and "testing" the quality and quantity of matter or the molecular structure packed in a sample to the glorious information knowledge about advanced and protean interpretation of the signals emitted from this particular sample.

But where we came to? "Protean" means "able to do many things", "diverse", "multi-changing" and could be considered as synonym of "prior", something which is primary, original, fundamental. It covers the title of the Aristotle book about analytics. We have only to add "analitika" as synonym of our well-known activity as analysts to reach the insight that the considerations of the ancient philosopher are close to our modern understanding of analysis in chemistry – a fundamental way of obtaining reliable signals from the universal matter and to interpret them cleverly and intelligently using not only advanced instrumentation but also procedures and skills from what today is called chemometrics, data, machine learning, artificial intelligence.

If we accept this idea of our profession and dedication about our life task, we could easier understand the special role of analytical chemistry for the chemical knowledge in general. There were times when the cocky representatives of physical chemistry (keeping for themselves the most important position in the development of chemical science) considered analytical chemistry as a subordinated discipline serving mainly for "data delivery" needed for validation of great theoretical studies. The gigantic devises for synthesis of inorganic or organic products made the respective colleagues from these branches also feel superior to us, analytical "maiden for everything".

However, the ancient origin and logistic background of the ability to analyze changed all these ideas about minority complex of the analysts. The modern definition of analytical chemistry could be approximately presented as **"the science of obtaining, processing, and communicating information about the composition and structure of matter. In other words, it is the art and science of determining what matter is and how much of it exists."**

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Additionally, it offers answers to specific questions about the hidden relationships between objects of observation and analysis (natural and synthetic products, environmental compartments, toxins, drugs, archeological artefacts, clinical checks, humans, etc.) and the variables (descriptors) characterizing these objects. This way of analyzing makes it possible to classify and model quite complex and diffuse systems and to predict their behavior. Thus, decision making and solution of problems seem accessible and adequate.

Now we have the privilege to face the centennial of our beloved Chair of Analytical Chemistry, the first in Europe independent analytical university facility. Usually, the fans of mocking love to say that “history is something that not really happened, described or reported by someone who was not there”. It might hold partially true for very distant events (e.g., is really Aristotle the author of *Analitika Protera*, the text is dated 350 years BC or maybe Plato was the real motivator?!). But for events as in our case the count is much shorter and subject to encompassing. Our history of a century is quite vivid and available – within the boundaries of approximately 5 generations, such a small piece of time. Personal names could be mentioned, the heads of the Chair could be easily recognized even by members of the fifth generation of members of the Chair. The complete bibliography of our scientific publications, books, textbooks, laboratory manuals could be found on the shelves of the offices. Even pictures from the earlier times could be dug out when making pictures and publishing in Facebook was not a universal obsession.

Our history is the history of intelligent and charming persons who tried to be active not only in the field of science and education (prove for this statement is the huge number of publications, well written textbooks for students, monographs, different scientific awards and even placement of

members of the Chair into the disputed but still quite affectionate Stanford University classification of scientists) but having interest to literature, music, art. I do not mention names on purpose, since the present celebration is not private but for all of us.

We participated eagerly in the processes of development of our science, sometimes very successfully, other times – more naive than real. But we should not forget that this is so typical for times of change of instrumentations, methods, scientific paradigm. We can immediately recall the periods of great hopes when we thought that spectrophotometry, or atomic absorption analysis or potentiometry with ion-selective electrodes will be “*ultima parola*”, *panacea*, the cure of all analytical problems. Today the new generation feels proud of the numerous options offered by “gas-mass”, some great imaging methods and other modern technical achievements. And the analytical “merry-go-round” will continue to jump and fall with the years to the next centennial.

That is life, my dear fellow analysts! A lot could be said or written in honor of an event like our centennial, tens, even hundreds of names could be mentioned, sad and funny stories may be recalled. What seems to be important in the present solemn day is to remember our predecessors, the founding fathers of our chair, to show respect to the memory of those who passed way or left the active part of their career and to wish all the best to the present members. For that reason, there is no need to mention specific names or events. Let accept that our pride and personal satisfaction is due to the fact that we reached the status of centennial participant in a tradition which has its roots in the ancient philosophy, transformed to the experimental stage of trial-and-errors and extracting new ideas and challenges from the era of artificial mind and immortal human spirit.

Gaudeamus igitur!