

BIOLOGY AS A BASIC SCIENCE IN TURKIYE

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We all are familiar with the problems of our century, such as; insufficient energy sources, inadequate supply of food, lack of industrial raw materials, the loss of natural balance in ecology due to pollution, increase in world population and health-related problems, decrease in fertile land and soil erosion, the use of chemical fertilizers and pesticides. All these and many more complex and vital problems with social, economic, technical and communal impact desperately need the application of fundamental biology. The value added by putting biological principles into effect is actually apparent. It all points out towards the effectiveness and importance of biology in world economies.

On the other hand biotechnology, which utilizes biological systems as technological tools in engineering processes, has emphasized the role of basic biology even more so as a recent development.

Considering all these facts, I felt I should undertake my share of responsibility by giving a historic overview of biology in Turkiye and the current state it is in, with the hope of supplying guidance in future evaluations.

Looking back, we see that when Atatürk founded the Turkish Republic, Biology, similar to many other sciences, was not very advanced. The first and the only university of the Ottoman Empire was Osmanli (Ottoman) University (Darülfünun), having been established in 1900. It was renamed as Istanbul University on 1 April 1924. At the time, Istanbul University had five faculties one of which was 'Fünun Medresesi' covering Natural Sciences. This included 'Fundamental Biology', 'Botany' and 'Zoology'. According to Article 5 of Ottoman University Law, "Each faculty's backbone courses required the establishment of departments bearing the name of these courses". Therefore, when the Republic was declared, Fundamental Biology was represented by the 'Science of Plants' and 'Science of Animals' departments.

As the time, ethical studies and philosophy were estimated, while all the basic sciences were as general subordinate roles. Accordingly, Biology was not considered to be a major areas of study. Furthermore, when Istanbul University was found according to Atatürk's University Reform after

Law Number 2252 was put into effect, Basic Biology Department was allocated a couple of rooms on one of the floors of the Zeynep Hanim Mansion with 4-5 academicians and assistants as staff.

Unfortunately, this misplacement of Fundamental Biology among sciences and under-estimation of its role, had a long term effect on Biology and on its development in Turkiye. Hence it was also considered as a secondary science. Its main function was assumed to give support to the training of applied biology. Furthermore, even today the role of Fundamental Biology is underestimated in the Turkish scientific arena. As far as I am concerned, this role is definitely an undeserved one. When one considers the crucial role that Fundamental Biology plays in solving the most complex issues of today's world, commonsense indicates that the way Basic Biology is treated is badly unjust. This wrong assumption is even more destructive for a country like Turkiye, which is still struggling for development.

Certain measures were taken in Istanbul University however against this misjudgment after 1933, after Atatürk's University Reforms. Following 1933, foreign scientists were invited to Istanbul University to undertake positions at various departments. Biology also had its share in this respect. With the motivation of these foreign academicians, Biology Institute was established in Süleymaniye, including Botany and Zoology. This institute was run according to scientific criteria accepted in the west, hence being founded on a firm ground.

Similarly when Ankara University was founded on 30 May 1940, based on Law Number 3848, there was a Basic Biology unit comprising Botany and Zoology.

Finally, the third step in the same direction was taken when Ege University was founded in Izmir in 1955, based on Law Number 6595. At Ege University Science Faculty was set up with a breakdown of various departments with in Fundamental Biology.

One has to add that, during the period following the 1933 Reform, Fundamental Biology units also existed within Forestry, Agriculture and Pharmacy faculties and equivalent vocational schools. However these units were institutionalized holding a constrained view, considering Fundamental Biology as a 'service' discipline for other 'major' disciplines.

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Undeniably these examples of institutionalizations also had an impact on the development of Basic Biology in Turkiye. However it must be also added that they have enhanced the misconception that 'applied sciences are what matters'. These assumptions have inherently helped in denying the crucial role that Fundamental Biology plays in all sciences.

On the other hand, in parallel with the developments which took place in Turkiye after 1950, universities also exhibited similar expansions. Universities such as Hacettepe, Ortadoğu, Atatürk, Dicle, Çukurova, Selçuk, even Fırat all contributed to the growth of Fundamental Biology in Turkiye. Although limited, they all helped in budding of this science in Turkiye and most of all in its structuring. Furthermore, during this period, in more recently established universities, like Anadolu, 19 Mayıs, Cumhuriyet, Trabzon, Uludağ, staffing was initiated and Biology was included in their curriculum at an introductory level.

Finally, in 1982 the newly passed Higher Education law Number 2547 enable existing higher education instituting to restructure and reshape. The number of universities reached to 29. Biology departments also expanded, comprising various departments within themselves. This occurrence by itself is an advancement for the future of Biology.

In fact, according to our survey, there are established 'Departments of Biology' in 22 universities (Akdeniz, Anadolu, Ankara, Atatürk, Bogaziçi, Cumhuriyet, Çukurova, Dicle, Ege, Fırat, Gazi, Hacettepe, İnönü, İstanbul, Karadeniz, Marmara, Ondokuzmayıs, Ortadoğu, Selçuk, Trakya and Yüzüncüyıl) out of the existing 29 universities, within either their Faculties of Science or faculties of Science and Letters. In all these Departments of Biology, there are General Biology, Botany, Zoology and Molecular Biology sub-divisions. Only three universities have additional Hydrobiology or Microbiology sub-divisions.

Overall there were 968 graduates from the Departments of Biology last year. A total of 6844 students are presently enrolled and an additional 1535 will be accepted for the coming academic year to the Biology Departments of these 22 universities. At the present, 280 academic staff (99 professors, 65 associate professors, 106 assistant professors) are employed in the Departments of Biology throughout Turkiye.

These data clearly indicate the current state of Fundamental Biology in Turkish Universities, its scientific structure, manpower and number of students on a comparative basis. My most sincere wish is that, the productivity of Fundamental Biology will be positively affected by the increase in numbers and the changes of success in this area will be heightened, in the future.

Happily, today Basic Biology units have a core staff in a number of sites. These units, although quite modest, generally have botanic gardens, libraries, herbariums, as well as

making use of museums. Taking all these developments into consideration, I believe that Fundamental Biology has reached a state where at least some good quality research is being conducted, on par with the other western institutions. In addition, over the last couple of years, "Biotechnology Research and Application Centers" were established within few universities namely Ege, Ortadoğu, Bogaziçi and Ankara. I feel that these Centers will also motivate the use of Fundamental Biology for increasing scientific productivity.

In reality, numerous academicians and scientists must be paid tribute to as the people who have helped to ascend the Fundamental Biology to its current state in Turkiye. Among many, I feel I should at least name Prof. Kosswig, Prof. Brauner and Prof. Heilbronn who have spent their lives, trying to inject western spirit of science and establishing firm standards in our Fundamental Biology Units in Turkiye.

When we look at Fundamental Biology's current state, we clearly see that most of the research conducted is generally related to Taxonomy, Morphology and Ecology and to a lesser extent to Physiology, Cytology and Molecular Biology. Undoubtedly, it will not be wrong to state that Fundamental Biology has come a long way since the time of the Republic. However, bearing in mind the substantial government support given over these last 70 years, one cannot comfortably claim that Fundamental Biology in Turkiye was able to keep pace with the advancement of the discipline in the world. I have to confess that we are still trying to bring solutions to the issues of classical Fundamental Biology, whilst the world is fully aware and already tackling the problems of Molecular Biology, Biotechnology and Genetic Engineering. Furthermore, it is timely and worth pondering over the reasons why we are constantly losing ground on the annual "International Scientific Citation Index" although considerable support was given to sciences after the Turkish Republic was founded. The only thing which is evident is that, like in most other areas of science, we have to speed up our studies in Fundamental Biology, improve the quality of work conducted and in general put in more effort.

The essence of it lies in a pioneer spirit, ready to make sacrifices, take the initiative, lead and guide young people who are just joining the profession. I firmly believe that if we can maintain this state of mind, Fundamental Biology or any other discipline in Turkiye will advance speedily and benefit immensely from this endeavor.

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