SUPPLEMENTING YOUR PRACTICAL BIOLOGY AT HOME

Guido Lanfranco

There are still numerous students who believe, that practical work in biology consists mainly of dissection of animal bodies. Needless to say, this is far from the truth. In fact, dissection is only an insignificant section of the entire syllabus, and even then is resorted to only at the end of a lengthy preparatory course in theoretical anatomy. A dissection is not a mere investigatory process, but a confirmatory one, to be made use of when the student knows what he is looking for. Practical work normally includes much microscope work, biochemical tests and investigations, general anatomy of plant and animal material, and a great deal of observation and interpretation of structures and behaviour.

In the school laboratory, one can be provided with the materials needed for the various investigations. The only materials which, in most cases, are not normally found in the home, are the microscope and some other costly or specialized apparatus. Otherwise, a large amount of the apparatus could be made at home by the student, using materials obtainable from ironmongers, chemists and other stores.

Some students expect that all the required work is done at school, but they should remember that school only provides the guidance, leaving the work to be done by the student himself. There are many individuals who have never attended a school for their Advanced level examinations, and yet succeeded with good results. Theory can be fully studied on one's own initiative in one's own time, but a little effort to do practical work in the home should be made. Nowadays practical biology does not only involve the various sections mentioned above. There is also ecology, and this, has to be taken seriously by students. Ecology must be studied in the field, and it stands to reason that students must study some part or aspect of the countryside on their own, where they will find ample material to use out of school hours. One should not expect that the subject must be studied at school in its entirety.

One's home can be a laboratory, because the term need not restrict itself to schools; wherever there is work being done, the place is always, technically speaking, a laboratory. Biology students know quite well, that they are able to perform a dissection of a small mammal at home,

as at school. Indeed there is an advantage in its being done at home, because one can take one's own time and speed, and with the help of books, go through all obstacles. Knowledge gained in this way is more lasting. Dissection should not imply only animal bodies, but plant material can equally well be dissected, with the simplest of tools. Fruit, flower and other anatomical specimens from the countryside, can be easily dissected at home with the help of the lens and tweezers, neeedles, droppers, pins, pieces of glass, and other odds and ends to do the same work one can do at school. Speaking from experience most biology students on selecting an assignment to dissect a flower they had picked and make observations on its other features at home ,in their own time, resort to books. They simply copy down information, and expect the work to be considered a sincere effort. Science must be truthful, and any work done in its name should show the mark of sincerity. On the practical side of Biology, in our islands, one must use foreign books only as a guide, and concentrate much more on the extensive material found in the home and in the local countryside. There are many species of plants and animals, which, though related to those studied in foreign books, differ grossly in their habits over here. Students are easily caught out when they pretend that they are using personal experiences, for their written work illustrates only what they have gleaned from foreign books. The student should not wait for some of the practical work to be done at school, before settling down to it. It is very much like the study of literature; students taking Italian or English literature, need not expect to read everything at school; they have to have a background of general knowledge of other works of literature which they had consulted and studied on their own, in their own time.

For all scientific practical work, a record of work has to be made. In the case of physics and chemistry, this record must include the apparatus and procedure, results and conclusions. It can be easily patterned out, and can be applicable to almost all experiments or observations. In biology, various difficulties may arise, because there are peculiarities not encountered in other subjects. The materials and apparatus may merely consist of either a living or a dead organism, or a part thereof, under a lens or fully exposed. Whatever the case, it is still essential to write down the aim of the investigation, the specimens that are being used, the method of investigation, and to keep a record of what is observed. The latter appears to be the most tedious and difficult item for biology students, because if the observations are based on a living specimen or dead tissues or structures, the records should show a diagram of what is being studied. These diagrams can be fairly quickly mastered after some practice, but the first difficulties entail the necessity of using conventional methods for scientific diagrams, and not for artistic purposes. Students gifted with artistic talent will of course find it

easier to use the pencil for the drawings, but they still will find that scientific diagrams are not to be drawn in the same way as in art lessons. The drawing in biology, which so many students find difficult, has to be clear, up to the point, and meant to illustrate something, not clearly demonstrated by means of words. It must include clear labellings of what is being illustrated. The labellings should also show a note or two on the observations or function of the labelled part, so that it will not be merely a list of words, but meaningful to you, and to whoever will see them afterwards.

What we have been suggesting is merely an effort on the part of the student to study biology out of school hours, to supplement and verify what has been learnt, or even to prepare for it. However, studying biology on the field requires a general knowledge of our countryside, with its flora and fauna. Few local people know anything about the wild plants and insects moilusca and other organisms which inhabit our islands. Even if one were not to use these for biological studies, one should make it a point to know something about them, for the sake of general knowledge. Biology students should appreciate them much more, because they understand that plants and other organisms are the basis of human ecology, and contribute to the survival of human beings. Whatever the attitude, wild flora and fauna should be observed especially by biology students. At the same time, the study of local wild plants and animals can be a very satisfying hobby and a pleasant way of learning.

There are ways and means of collecting specimens of all types, always keeping an eye on the norms of conservation. Many collect and study insects, wild plants, land shells, seashells,fish, and other organisms. This is more satifying than just collecting stamps for the science student, because he would be dealing with material directly connected with his studies. Others collect and study geological material, also shedding much light on the origin and properties of soils as a basis of life. Many students who collect and study these materials find that biology becomes easier, since any branch of natural history collecting and study will overlap on other subjects which together all lead to a consolidated knowledge on life around us. I am not suggesting mere collection, because this is against the rules of conservation of nature, but collecting can also be done whilst ensuring conservation. This subject of conservaiton. In fact forms part of ecology, which, after all falls within the biology syllabus. Students will gain more meaning if their visits to the countryside are aimed at understanding what one comes across rather than just looking around.

You can decide, as from now, to make an effort to study practical biology on your own. Leave the more complicated apparatus for school work, but no one prevents you from starting to look closer at wild flowers, take same specimens, and settle down to gain as much information as possible by closely studying them

at home, with the help of a lens. In this way you will be adding more meaningful diagrams to your lab. book; not only plant material, but it without complicated means, and you may only have to ask some assistance from your teachers in a few intances. Knowledge gained through one's own efforts is more satisfactory, more lasting, and more appreciated, with the overall reward of success based on genuine effort.

also all the animal aspects of biology, including experiments and observations on behaviour, dissections and studies recorded by relevant notes and diagrams. Take any part of your biology syllabus, and you will find that you can tackle most of

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Guido Lanfranco, M.I., Biol., teaches Biology at the Upper Secondary School, Valetta.