

It is not surprising, therefore, that Lord Fairfax should have entrusted to him the important mission of surveying and mapping the vast Fairfax estates.

This was the beginning of George Washington's great career, and fortunate indeed was it for the American colonies that this boy of sixteen should have been given this opportunity to fit himself for the military service of his native land and to widen his vision of the future possibilities of the growth of the colonies to the westward. Thus even in early youth, he not only became a potential empire-builder, but also by his battling with nature in its wildest form, by overcoming the obstacles which confronted him, by practicing painstaking efforts to achieve accuracy, and by constant exposure to the elements, hardship, and danger, he so toughened his physical fiber, so developed the quality of his mind, and so strengthened his naturally strong will that he became splendidly equipped to take up the rôle of leadership, first in the minor field of the French-Indian War, and afterwards in the vastly greater field of the American Revolution.

That his three years' work as a surveyor was well done is demonstrated by the facts that his surveys were regarded as authoritative by his contemporaries, and that their accuracy stands unquestioned to this day.

As I understand it, my task ends here with the entry of the youth at the age of nineteen into the arena where his life's battles were fought; and I will therefore conclude my remarks with an expression of my belief that he was neither a dull nor priggish youth, but was a manly, upstanding boy and young man, full of the joy of living and very human; and that beneath his agreeable and pleasing manner there slumbered a fierce temper and fiery passions which even in youth he held under stern control by the exercise of his unyielding will.

Truly the youth was father to the man, and even now, it is not difficult to under-

stand that he was, in reality, throughout his conspicuous career, "First in war, first in peace, and first in the hearts of his countrymen."

JOHN A. LEJEUNE

## THE RESEARCH RACKET

A GREAT many teachers, both in school and college, develop a sort of inferiority complex because they are not personally engaged in what passes under the name of "research." It may be worth while for those of us who still believe that teaching is an honorable and self-respecting profession to demand a definition of the overused term "research." It is meant that only those whose minds constantly react to a given mass of material can hope to teach it effectively, we can only reply that this is a truism; that no person of active brain who teaches can refrain from constantly examining and reflecting upon his subject matter; but if it is insinuated that he ought also to publish monographs on the subject, we ought to answer that the publishing of monographs need not necessarily invigorate teaching. There has grown up in our American colleges, particularly under the influence of wealthy research foundations, what can only be called a "research racket," designed to stimulate the accumulation and publication of facts regardless of the researcher's capacity to interpret them. More and more the various disciplines taught in our educational system come under this influence. In my own discipline, history, such shibboleths as "scientific method" are bandied about without the least clear conception of what they actually mean—for example, to a scientist. We teachers should decline to be beaten over the head with empty terminology. If, for example, "scientific method" in historical research means a clear understanding of one's material and intelligence and truth in working upon them, we ought to answer that we already knew those traits were

necessary to the historian long before "scientific method" began to get too much publicity. The best weapon the teacher has against the smoke screen of half comprehended research terminologies is a good laugh and the determination to go on using his brain—if God gave him one—as effectively as possible in guiding the newcomer into unfamiliar territory.

STRINGFELLOW BARR

## BIOLOGICAL TECHNIQUE IN THE HIGH SCHOOL

**I**N TEACHING biology in the high school one of the first considerations of a good teacher should be not only to "put across her subject matter," but also to create in her laboratory periods enthusiasm and willingness among the pupils to learn, see, and know things. Each biology teacher should be trained in certain techniques to be an effective teacher. When a student from college goes into a small high school where there is very little equipment, she will find it necessary to improvise and substitute equipment. A few of the less technical methods which may be used in the high school laboratory are given below.

In the study of plants the "pocket garden" is a simple but effective teaching device. It provides ready material for the study of seedlings, roots, and root hairs. It may be prepared as follows: Clean thoroughly two pieces of glass about 4x4 inches. Cut blotting paper to fit the glass plates. Place the blotting paper on one of the glass plates and place a few radish seeds on the blotting paper near one end. Cover with the second piece of glass and bind together with rubber bands protected from the sharp edges of the glass by strips of paper. Place the "garden" in a vertical position in a glass of water, taking care that the water does not cover the seeds. The blotting pa-

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per should not be allowed to dry out. The seeds will germinate in a few days and a good growth of root hair should be obtained on the young roots.

Sections of plant tissue may be made with a fair degree of success by using new safety razor blades. These blades work well at first and may be discarded when they become dull. A razor with a blade which is only slightly hollow ground may also be used, but must be sharpened frequently. A limited amount of slide-making is possible in the high school laboratory, and it may be carried on with very limited equipment. Several methods may be used. Woody stems may be sectioned directly and the sections may be killed in 95 per cent alcohol. Fleshy stems, young stems, soft roots, leaves, etc., will section better if hardened in 95 per cent alcohol for 18-24 hours before sectioning. The pieces of material placed in the alcohol should not be more than half an inch long.

*Glycerine-jelly method.* This method is suitable for mounts of material which may be mounted entire, such as small moss plants. Thoroughly clean the material and place it in a ten per cent solution of glycerine. Leave the container open to the air, but protect the solution from dust by covering lightly with a paper. When the solution has evaporated until it is the consistency of pure glycerine, mount the material on slides with glycerine jelly. Sections of soft plant tissues may be treated similarly after they have been stained.

*Balsam mounts.* Section material and kill in 95 per cent alcohol (if not previously killed). Wash with water and cover with an aqueous solution of safranin and leave for 24 hours. Wash sections in water until the water is clear. Destain in a watch-glass of fifty per cent alcohol to which one drop of HCl has been added until the phloem and cortex are a very faint pink. Transfer the material to 95 per cent alcohol for five minutes, then transfer to light green which is made up in 95 per cent alcohol.