

## FURTHERING YOUR OWN EDUCATION

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Everyone has seen, I am sure, the little figure of three monkeys with hands over eyes, ears, and mouth. One is called See-no-evil, one Hear-no-evil, and one Speak-no-evil. Unfortunately, the one with hands over eyes sees NOTHING, the one with hands over ears hears NOTHING, and the one with hands over mouth says NOTHING. This kind of figure should certainly not be a talisman for a young scientist. We should remold the figure and put the hands above the eyes, behind the ears, and cupped around the mouth so that the monkeys can now be called See-well, Hear-well and Speak-well. An educated person must be all three at the same time.

Careful observation is a very important part of science, as everybody knows, so young scientists should get in the habit of observing things they see. I am sure everyone has had the experience while reading of looking at every word, turning page after page, and yet not being able to recall a single thing that one has read. Too much of the time we read the book of the world around us in the same inattentive way. How many constellations in the heavens can you recognize? How many bright stars can you name? Have you ever followed the moon through all its phases? You don't have to be an astronomer to do these things. You only have to be a human being with eyes. How many birds can you recognize by sight? How many trees do you know? How many wild flowers can you put a name to? You don't have to be an ornithologist or a botanist to know these things. And you don't have to be a geologist to see that in some places the surface of the earth seems to have been folded and compressed and in others left flat, and to wonder how this could come about.

There are lots of man-made things that are exciting to look at too. Have you ever admired the arch of a bridge viewed from the side? Do you go to art exhibits whenever you can? Sometimes it takes as much, if not more, effort to *observe* these things as it does to observe natural phenomena. When you look at a so-called "modern" painting do you dismiss it with a glance and say it means nothing to you? You should remember that you live in the twentieth century and the painting and the sculpture of the present day reflects a culture that you are a part of and that will have meaning for you if you will make the effort to observe it. And all the things to read!—the poetry, the magazines, the books that people are writing today — not to mention all the things that have been written in time past. Have you read



Robert Frost's poetry? Do you know A. E. Housman's "Reveille"? Have you read *Alice in Wonderland*? Have you read *The Catcher in the Rye*? Do you use a dictionary as you read? — that's the surest way to "observe" while you read. This is an exciting world we live in if we will only develop the habit of OBSERVING.

One of the most rewarding habits a person can have is the habit of listening. What sounds do you hear right now? How many bird songs can you identify? Do all cardinals sound exactly alike? Does the wind in the pines sound like the wind in magnolia trees? Can you recognize the make of a car by the sound of its engine? Can you tell what kind of a day your mother has had by the way her voice sounds when you get home from school? Listening in class can often cut home-work time in half. Listening to the speakers at school assemblies and at meetings such as these we have had in connection with this summer program can be as instructive and interesting as reading. Even more rewarding is listening to music,—and this does not mean "background music" while you study, but "listening music" that you use your ears on. Did you know that music by Bach has a lot of Boogie in it (or perhaps I should say that Boogie has a lot of Bach in it)? Can you tell just by listening whether a sonata is by Mozart or by Beethoven? Can you tell whether a song is being sung by the Kingston Trio or The Brothers Four? Have you ever LISTENED to Elvis Presley? Do you attend Symphony concerts? Have you LISTENED to a composition composed since 1900? since 1940? Do you listen to Leonard Bernstein's programs on the Television? Have you read poetry aloud? Do you play a musical instrument? Our world of sound is made of bird songs and the wind, of symphonies and rock and roll, of lectures and conversation and the full life partakes of all. Are you LISTENING?

The mark of an educated person lies more in speech than in anything else. It has been said that we give ourselves away the minute we open our mouths. Since our chief means of communication is speech, we should speak grammatically, enunciate clearly, and choose the proper words to make our meaning clear. This is rather a large order and cannot be achieved without effort, just as we cannot observe without effort and we cannot listen without effort. Your parents and your teachers have been setting as good examples as they know how for you for all the years of your life. The way that you speak is not really up to them, however. It is up to you. No one can increase your vocabulary but you. How many new words have you learned in the past three weeks? Do you enunciate them clearly? Do you know how to spell them?—because communication includes writing as well as speaking. Do you use slang? This is quite all right in the appropriate place. A touch of regional accent also lends color to speech, but a distortion of the pronunciation of a word marks the speaker as careless in speech or lacking in education. Do you



say in'surance or insur'ance? Have you ever looked the word up in a dictionary?

No one can enrich your life but YOU. You can do it by using your eyes to see well, your ears to hear well, and your mouth to speak well. You can be the three in one.

(A talk given to the Knoxville Junior Academy of Science and the NSF-sponsored Summer High School Honors Program at The University of Tennessee, June 29, 1960.)

### **"DO IT YOURSELF" HIGH SCHOOL PHYSICS EXPERIMENTS**

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Lacking standard physics tables with necessary D. C. outlets, Clarksville High School physics classes have met the need for individual experimentation in the area of electricity by using systematically packed equipment kits. The meters, Wheatstone Bridge, coils, resistors, connectors, leads, switches, batteries, and various attachments all fit into a specially designed metal case, which can be checked and packed in five minutes.

The high school physics experiments were designed for this type of laboratory procedure by Melburn Mayfield of the Physics Dept. at Austin Peay State College. The equipment and cabinets were constructed at the Barnett Instrument Mfg. Co. of Clarksville, Tenn.

Clarksville High School purchased a dozen high school electric kits which include student experiment and data sheets, as well as instructor manuals.

Three physics classes and two physical science classes use the kits and work in pairs. The names of all students using the kits are typed on an equipment list which is attached. If materials should be missing or out of order, the person responsible can be identified. The students are conscious of their responsibility in caring for the equipment. Loss and breakage are at a minimum.

At the end of each class, the kits are checked and packed by the students responsible. This can more readily be done because kits and equipment are plainly numbered. Also pieces of equipment fit into sockets, pockets, or special places.

The high school course in the physics of electricity was developed in a National Science Foundation High School Science Institute in the summer of 1959 at Clarksville High School. This institute was conducted by Peabody College, under the supervision of Arlo Eager, Principal of Clarksville High School. The course in electricity was taught by James L. Major with Melburn Mayfield acting as counselor.



Ronald Cole (top) and Donald Chester (bottom) are shown checking resistors in electric circuits.