Biologists Are Curious

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A scientist must be curious. He must ask questions of things and about things. So while my students are carrying on their studies and experiments and making observations, I have made some observations about my students. These high school biology students are sophomores, about fifteen years old.

Here are some of the questions I have been trying to answer:

I. *Why do indifferent students (those who have D and F grades) have more absences than the high-ranking students (those having A and B)?*

Or do they? Are the absences necessary? Are they a contributing cause to the poor work? Or, is lack of purpose the cause of the frequent absences?

For eight years I have been trying to answer these questions. Each year we have from 110 to 120 pupils taking biology. Each year that means 30 to 35 A or B students and as many with D or F.

Each year the low-rating group averages from 2 to 3 times as many absences as the top-ranking group. I have the data on this for eight years.

Quoting from the Caldwell-Lundeen studies: "Large numbers of individuals of the same age have been divided into two groups on the basis of their intelligence or capacity for learning. It has been found that the most intelligent groups are not only slightly superior in desirable physical traits but also in other desirable traits such as character, disposition, artistic ability, interest, and ability for different kinds of skills. . . . On the average, among large groups of people, all desirable traits tend to be associated with each other." Is the first part of this statement the answer, that the poorer group mentally have poorer health?

Or does the poor attendance stem from lack of purpose—lack of stick-to-it-iveness? Is it easier for those with less interest in life to find excuses for staying away from school?

Or do parents of ambitionless students urge the absences, reasoning that if the son or daughter is not inclined to work he might as well be helping at home?

I do not know the answer. Many articles have been written about this problem, but scientists do not make hasty conclusions. The fact remains that absence from school has a definite correlation with the quality of work done.

It is also a fact that people cannot be averaged; each person differs from every other.

II. *Are young people literally hot-blooded?*

In our elementary biology classes temperatures of all students are taken. This is done so that each one may learn the use of the clinical thermometer. The data now include temperatures for over 300 young people, ages 14 to 16. In comparison with "normal" body temperature of 98.6 the average for these 300 students is 98.3. The average for 65 students in the 3:00 to 4:00 o'clock groups is only 98.49. Not a fifth of these young people can get the thermometer to register as high as normal—at least, in the daytime.

III. *When are young people grown up?*

That question refers to growth in height. Certainly the data in connection with the growth of 15- or 16-year-olds are too varied to be of value. It seems to be generally agreed that the age at which one acquires full height, or at which he makes his spurts in height, is inherited. One boy is short at 18 and will grow later, while another boy is through growing at 15 years. In our biology laboratory we have recorded heights over 8-month periods for students in their fifteenth year. One year 46 boys averaged 1 inch growth in the 8 months, while the girls averaged $\frac{1}{4}$ inch in the 8 months. It is interesting to note that three

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boys gained $2\frac{1}{2}$ inches in two-thirds of a year, while no girl gained more than an inch. One year the shortest boy gained $3\frac{1}{4}$ inches in the 8 months. This fits in with the common belief that girls are nearly through growing by the sixteenth year.

IV. *What is the frequency of colorblindness?*

For several years a test for colorblindness has been given in our biology laboratory, but this is now done in the Driver Education course.

I have never found a color-blind girl.

Of color-blind boys there are usually 4 or 5 among the 55 or 60 taking the course. This seems a bit high since in the general population (according to the usual data) the average is 1 color-blind boy in 25, and one color-blind girl in 250.

V. *Do most folks know that man has more than five senses?*

We have been trying to teach-down that old misleading statement, "the five senses."

At one of the local theaters, one evening, one of our biology students in attendance asked ten patrons, "How many senses does man have?" Of the 10 persons, 8 answered confidently, "Five." One said, "More than five." One named eight of them. Majorities are not always reliable.

VI. *Do young people like noise?*

Do they like it continuously, spasmodically, or infrequently? Do some like it and others not? Or is noise merely a cover-up for not knowing how to converse, or how to sit quietly with poise? Of course this article is not answering those questions.

Each fall near the opening of our biology course each pupil writes a page or so of description of the "spot out-of-doors" which he enjoys most, and is asked to tell why he likes it. He is told that it may or may not fit in with biology. Usually he ties back to a summer vacation. It is significant that only three persons of more than five hundred have described participation in a sport or even being a spectator. The reason given most often for liking the place is—as it would be for an adult—"the peacefulness," "the quiet," the "being alone to think," "the hush."

We adults often forget that young people have few wide acres for roaming, few woods through which to shuffle in autumn leaves, few barn lofts, few attics, and, because many families live in small apartments, the chance of a boy or girl ever being alone is meager.

Perhaps young people do not differ so much from adults as each person differs from himself at different times. We all like noise at times, and we all like the hush of evening far from the chance of interruption. We all want to live serenely. Man differs from youth to age less than he differs from hour to hour.

VII. *What do young people fear most?*

An interesting questionnaire for biology students comes up in connection with our work on the nervous system. It is an attempt to find the most common causes of fear in youth. Even though the questionnaires are unsigned it is probable they do not mention their worst fears. Several students do sign their names having been reminded that sharing a fear may help to erase it.

The fears mentioned most commonly are: darkness, accidents, sickness, death. But these fears seldom enter into their dreams.

Their most common sorrows are: death or illness of grandparents, parents, or other members of the family; divorce or quarreling of parents; loss of a friend; loss of a pet. Other sorrows are mentioned much less often. And these sorrows seldom enter into their dreams.

For most young people dreams are usually pleasant.

VIII. *What do young people consider the purpose of life?*

This question has been asked for three years. Some do not answer it, perhaps never having thought of life as having a purpose, or having thought much about it but found it too profound a question to answer.

One year 63% said in one manner or another the purpose was to get ahead, to have a good time, to get enough education to get a good job, to earn money. But 20% answered

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that they owed a service to others, and some included self with others, so that at least a third of them recognized an obligation to mankind. This year the proportion is larger.

From these groups may yet come a St. Francis, a Savonarola, or an Albert Schweitzer.

IX. *Which unit of work studied during the high school biology course is "most interesting and seemingly will be most helpful" to students?*

It might be expected that the choice would be an easy unit with many films, field trips, spring specimens in the laboratory as in Conservation of Natural Resources, or one with laboratory experiments as The Human Nervous System.

But the majority do not choose these units. Their choice is Genetics. That three weeks unit always gets the largest vote. For second place frog dissection and general human physiology tie in interest. In fact, frog dissection is used as an introduction to the human body by comparing like organs and functions and noting differences in location, size and function.

To quote Chesterton, "There is nothing like so interesting to ourselves as ourselves."

Data about groups of people are interesting and often helpful. But if an article of this nature leads us farther from the individual student it is worse than useless. There is no average person. There are trends. And we biologists are curious.

A Busman's Holiday

Editor, *The American Biology Teacher*
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Dear Mr. Breukelman:

Perhaps your readers might enjoy hearing of the "busman's holiday" of a parasitologist. If you can use this letter (and the accompanying photos), please do so. I feel that it contains information "what caused the death of the porpoise?" of some value, and I should like to share my speculations with others.

On June 13, 1952, early walkers along the beach at Pawley's Island, South Carolina, noticed a dying or dead porpoise stranded in the breakers. I saw it at 8:00 o'clock.

It was a nine-foot specimen, with no external signs of injury, although its skin was marked by the ineffectual bites of sharks. These marks were extensive, but not one of the bites had penetrated more than the pigmented outer layer of the skin.

Several friends who knew of my professional interest (in intestinal worms) began to speculate on what parasites the porpoise might have. With some reluctance I decided to examine it for intestinal parasites. Using a pocket knife (I was theoretically on vacation, without equipment), I made an eight-inch incision in the right belly, and, reaching into the cavity, began to pull out the intestine. Incidentally, the porpoise was still quite warm inside, although not living. After surprising amounts of intestine lay rolling in the surf around my feet, I cut the attachments at stomach and colon, as well as the large vessels and mesenteries, and carried the slippery arm-

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