School

Common Science

Joe Jeffers, Ph.D.

By JOE JEFFERS, Ph.D.
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Everyone is somewhat familiar with Morse Code from experience with Scouts or from watching old westerns on television. A series of dots and dashes (in groups of three) code for each letter in our alphabet. One can transmit a message of any length or complexity using only these two symbols, the dot and the dash.

A similar coding system is used in our bodies. Molecules called DNA are responsible for controlling our development and function. DNA is the hereditary material passed from one generation to another. It is like a blue print. From its coded information the magnificent structures of our bodies develop over a period of a few months from single cells into creatures containing billions of cells - liver cells, nerve cells, muscle cells, etc. Each of these cells needs to work perfectly and in harmony with the other cells so that we function normally. Millions of chemical reactions need to be controlled for this to happen. How does DNA do it? DNA codes for the assembly of amino acids into proteins. There are many types of protein molecules coded by DNA, among them a particularly important type, the enzymes. Enzymes control almost every chemical reaction that occurs in our bodies. How we develop and function depends on these chemical reactions. If DNA can control the making of enzymes, it can control all of the reactions that make us work.

DNA is composed of two long chains containing four types of links which, for simplicity's sake, will be called A, G, C, and T. each chain may contain hundreds of thousands of links. The two chains are complementary. Where A appears in one chain, T appears in the other; where G appears in one chain, C appears in the other.

As an example, think of two long lines of students. One line faces the other. A black male student in one line faces a black female in the other; a white female student in one line faces a white male student in the other. When it is time to make a new copy of the "DNA," the two lines are separated. Each one can be used as a template or pattern from which to make a new complementary chain. Across from each black female, a black male must be placed; across from each white female a white male must be placed.

Since the two chains are complementary, DNA can be reproduced very accurately generation after generation. The need for this accuracy is simple. If the copying process were sloppy, the DNA would contain mistakes that would result in bad enzymes and genetic defects could result.

Each section of DNA that codes for a protein is called a gene. A single DNA molecule may contain thousands of genes. DNA is not used directly for the assembly of proteins, rather it serves as a master copy from which large numbers of smaller approximately gene-sized "messenger" RNA molecules are made. RNA contains the same coding information that DNA does since it too is a chain made of four types of links.

These four types of links in RNA must be used to code for twenty different amino acids. Like the dots and dashes of Morse Code, the four links in RNA must be arranged in groups of three to get enough codes for all twenty amino acids. For example, CAG codes for one Amino acid; AGC codes for another.

In organisms like man, DNA actually contains extra links that do not code for amino acids. After RNA has been made from DNA, it must be "processed" to remove this extra material. Consider the following analogy: "Now is the txycl aryle mcqrp xnime for all good men to come to the aid of their country." The extra material ruins the message and must be edited out. If the xycl aryle mcqrp xn is cut out and the sentence is spliced back together, it reads "Now is the time for all good men to come to the aid of their country." The processed RNA can then be used to assemble amino acids into proteins. The reason DNA contains this extra material is not known; but much research is being conducted in an attempt to find out.

(Joe Jeffers, Ph.D. received the Ph.D. in molecular biology and biochemistry from Purdue University. He teaches chemistry and biology at Ouachita Baptist University in Arkadelphia, Arkansas. "Common Science" appears periodically in The Dallas Post.)

Lehman reps

Northwest Area High School is hosting this year's Regional Chorus. Singers who were selected from the District Chorus will be presenting two concerts and auditioning for the State Chorus which will be held later this month. Representing Lake-Lehman High School will be Lori Cragle and Rebecca Roskos, who are under the direction of Miss Jane Morris. They will be at Northwest from Wednesday, March 12, through Saturday, March 15, with concerts on Friday evening and Saturday afternoon.

Mr. Stretansky, Susquehanna University, will be the guest conductor. Above, from left, Lori Cragle, Rebecca Roskos.

Youth Salute luncheon held

The third Annual Youth Salute kick-off luncheon was held at Convention Hall, Pittston. The National Council on Youth Leadership coordinator, John Rygiel of the Rygiel Studio reported an excellent turn out. The luncheon was sponsored by Mr. Sam Falcone of Falcone Beverage.

Counselors, teachers and principals of all local high schools were invited to learn more about this year's Youth Salute. Schools represented were: Bishop O'Reilly, Riverside, Seton Catholic, West Side Vocational Technical, Tunkhannock Area, Coughlin, Wilkes-Barre Vocational Technical, Crestwood, Bishop Hoban, Hanover Area, Meyers, Wyoming Valley West and Dallas Area.

The program works in this way: a local high school junior, who will be a senior next year, is nominated by a counselor, principal, teacher, clergyman, or parent to be the local Youth Leader of the Year.

LAKE-LEHMAN SCHOOL NEWS

SUSIE REDMOND THOMAS STEPANSKI

MARK WILLIAMS is the son of Mr. and Mrs. Dean Williams of Hunlock Creek. Mark is involved in Field Band, Concert Band and Brass Choir. He also enjoys reading, model building and bottle collecting. Mark's future plans include attending college where he will major in the science field.

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LAURA WENDEL is the daughter of Mr. and Mrs. Richard Wendel of Lake Silkworth. Laura is involved in the Student Council. She is also a member of the tennis team. Laura enjoys dancing, swimming, and skiing. Laura's future plans include attending college to major in psychology.

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MICHAEL KIRCHNER is the son of Mr. and Mrs. Bert W. Kirchner of Harveys Lake. Mike will be attending L.C.C.C., his major being Culinary Arts. In school he is a member of both the golf team and the Ski Club. In Mike's spare time, he enjoys skiing, playing golf, and cruising the square in his Porsche.

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DANA HENNINGER is the son of Mr. and Mrs. Dana Henninger Sr. Dana plans on attending college but he's undecided of his major. In school, Dana is involved in track and cross country. His events include 2 mile relay, 1 mile run, half mile run, and the mile relay.

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THANK YOU to the Booster Club for a successful dance that featured "The Great Rock Scare" which was held on Thursday, March 13.

LIU offers scholarships

Dr. Thomas F. O'Donnell, Executive Director, Luzerne Intermediate Unit 18 announces that full scholarships will be awarded to high school students from across the state to attend the newly created Pennsylvania Governor's School for Agriculture (PGSAg) at the Pennsylvania State University in University Park this summer.

High School sophomores and juniors, including the handicapped, who have demonstrated exceptional ability in the sciences and who have a high interest in any aspect of agricultural science may apply for the scholarships to attend the five-week residential program which will run from June 29 through August 2.

Those identified to participate will study select areas in the science of food, agriculture and natural resources. Course offerings not generally available in students' home schools will include robotics, remote sensing, applied market policy, silviculture, nutrition, food biochemistry and environmental resource management. Field trips, laboratory experience, guest speakers, career workshops, and leadership training are also scheduled for the summer's activities.

Sponsored by the Pennsylvania Department of Education and the state's intermediate units, the full scholarship include tuition, room and board, and classroom supplies and equipment. All interested students should initiate the application process as soon as possible. Contact guidance counselors or the local intermediate unit for information and application materials.

The deadline for students' guidance counselors to have submitted applications to the Pennsylvania Department of Education is 3 p.m., April 18, 1986. Students may apply to more than one Governor's School.

Arthur P. Pupa, Supervisor for the Special Education Department, Luzerne Intermediate Unit 18 is the liaison for the Pennsylvania Governor's School for Agriculture.