

rooms, lack of facilities, and other factors are partially responsible for this condition. I am confident that the justification for the teaching of this method, as a standard method of problem-solving and investigative approach, lies in the real practical values it contains for the students.

The student who can acquire the ability to apply The Scientific Method toward the solution of problems he faces is at a decided advantage. The specific value obtainable from its use will be in direct proportion to the ability of the student to master its practical applications in the many types of difficulties he encounters in everyday life. Obviously, his understanding of The Scientific Method as a usable technique cannot come about from the mere ingestion of a few lectures or a few articles on the subject. Meaningful *use* and *practice* of the method by each student is *essential*. For the teacher who recognizes each student as an unique personality, and who tries to teach his students as individuals, the problem of adapting the method to best meet the individual's needs becomes great and the obstacles to be overcome difficult. The teacher can, in a very general way, make at least a beginning by utilizing one or more of the following techniques:

1. Provide students with a simple explanation of the scientific approach and its uses, and provide an opportunity for each student to practice the technique in simple ways.
2. Try to help students to make accurate observations, and group these observations into logical conclusions in a variety of situations and under a variety of conditions.
3. Try to have students work on a single specific problem and encourage them to analyze the problem, discover the facts involved, draw inferences, decide on a plan of action, and carry it out to its conclusion.
4. Encourage the development of a reasonable skepticism, based upon logical and orderly thinking, about all problems. Utilize the practice of constructive criticism and creative thinking. At the same

time encourage tolerance and respect for others.

5. Try to develop in students the ability to see things in true perspective, and how to relate things to reality and practical living, that they may more effectively utilize their newly-gained knowledge of scientific procedures more advantageously.
6. Encourage use of The Scientific Method in solving problems encountered outside the classroom and in other classes.

The approach of college science in employing The Scientific Method has been centered upon its applications in research activities. This might be called the basic aspect of the method, for it is this approach which concerns itself with the discovery of facts and their ultimate organization into principles.

Secondary education should, it seems to me, concern itself more with the practical phases of the procedure. Students might well profit from applying scientific principles to practical problems of the classroom and real life, rather than unduly concerning themselves with concentration upon the learning of facts—facts which are often unrelated to the individual student's needs and impractical in application. It would, therefore, seem advisable that high school instruction place greater emphasis upon the practical side of science education. Since the large majority of high school students do not continue their formal education beyond the secondary level, it would seem logical to give them a usable technique which contributes to organized thinking and provides carry-over into many real life situations.

BIOLOGY LABORATORIES

By THE OLD FOSSIL

ANIMAL OF THE MONTH, a large-sized halftone picture of bulletin-board size, may be obtained free. The animal selected each month is, in the opinion of the experts at the Lincoln Park Zoo, most interesting, unusual, and appealing to zoo visitors. These posters are sent out monthly to schools throughout the nation who request them for use on their bulletin boards. Write to Charles E. White, Public Relations Department, The Quaker Oats Company, Merchandise Mart Plaza, Chicago 54,

Illinois. Please mention "The Old Fossil" when you write to Mr. White.

ZOOPARADE is a telecast of unexampled encyclopedic biological interest. Each program is built around the history, origin, habitat, life span, and other factors of animal life. Mr. White gave TOF a sumview of future television shows: "animals in stamps, coins, flags and emblems; animals in children's stories; the zoo veterinarian visiting the animals; and a test of your animal sense." These were a nreview of coming attractions for the spring. The program originates from Lincoln Park Zoo, Chicago.

YOU CAN PAINT WITH A PENCIL by Freer, N. Y., Studio-Crowell Publications, 1951. An illustrated text on how to use the broad stroke of a "carpenter pencil" (flat size 6B) to produce figures of animals and other biologicals of interest, price \$2.50.

THEORY OF THE MICROSCOPE is a précis on the topic. There is much excellent material here which can be used by the general biologist and physicist. Quoting, "This booklet has aimed toward helping the microscope The aim has been to present the material in an interesting non-mathematical style." It may be obtained from the *Bausch and Lomb Optical Company*, Rochester 2, N. Y.; free.

TOF FAILED to mention trend observations of The International Livestock Show. It is primarily a cattle feeders show, swine and sheep are of secondary importance; and wheat, oats, and lesser grains, are "also rans." Lard type hogs are on the way out. These cannot compete with soy bean and cotton seed oils. Dairy cattle are not shown as their products do not market thru the stock yards.

LIFE'S VOCATION, as disclosed by Professor Butz of Purdue University, before the Illinois Agriculture Association for 1951, is sumviewed as follows. "There are prospects for reasonable earnings for farmers who are efficient, progressive, and scientific. For the long pull ahead, as a life's vocation, agriculture has as much to offer as any other comparable vocation to the young man who desires a comfortable standard of living for his family, good environment, and an opportunity to provide his own security for his declining days." It is an encouraging statement for this phase of our national economy. Farming, in the past, often has been taken very much for granted, yes, even tolerated or looked down upon by both the labor and white collar groups.

WASHINGTON HIGH SCHOOL in Milwaukee has a greenhouse. Mr. Jacque D. Vallier, chairman of the biology department, wrote TOF for a copy of

Greenhouse Techniques mentioned quite some time ago. He stated: "I thought that perhaps this might augment such plans as I already have." I located a copy and sent it to Mr. Vallier. This was perhaps a record for delayed action. Time means little to fossils.

INDIANA TRAPPERS reported good catches last winter. Frank Martin, Fulton, a former student, living next door, is a night telegraph operator. He "runs" his 110 traps each morning. One week's operations produced over ninety pelts. Frank's best sales outlet is one of the large mail order houses. He places his traps along dredged ditches, but not in timbered country.

FOOD FOR YOUR PLANTS (fertilizers) may be added directly to the soil or sprayed, as a solution, both on the soil and the plant. The three important available food elements are: nitrogen, for leaf growth; phosphorus, for flower production; and potassium, for stem strength. Trace elements are also necessary, but they vary from plant to plant type, in kind, and quantity. A one-half teaspoon of commercial fertilizer may be added to a two- or three-inch pot every two or three weeks. For a three- or four-inch pot a teaspoon full is a sufficient amount. For four- to six-inch pots a tablespoon full can profitably be added with the same frequency of application.

MIRACLE DRUGS are wonder workers; or wonder drugs work miracles. Pay and take your choice. Two of these are terramycin and aureomycin. Both are relatively non-toxic antibiotics. The first is derived from soil bacteria, the other from bread mold. Robert Ivan Zeman, R.Ph., Chicago, proprietor of the drug store a couple of blocks down the street, and the North Park College hang-out, has this to say about these drugs. "They make the treatment of pneumonia easier than that of a common cold." His two children, deep in the throes of scarlet fever, had temperatures immediately abated, with no deleterious after effects with aureomycin.

AUREOMYCIN, A REVIEW OF THE CLINICAL USES OF, 1951, Lederle Laboratories Division, American Cyanamid Company, 30 Rockefeller Plaza, New York 20. This monograph of 250 pages has a nine-page Clinical Index listing diseases which are discussed in its pages. The bibliography has 783 sources recorded. Leprosy and many of the other old toughies are discussed, on down to human bites. TOF thanks Mr. Zeman for a loan of the book and a look-see of interesting reading. It is the same aureomycin that made the headlines of magazines and newspapers a few months ago. Scientists were

putting aureomycin in the food of new-born pigs and they responded with accelerated weight increase and there was a remarkable decrease in pig mortality. The death rate of pigs reaches more than fifty per cent and has a national average of near thirty per cent. There is little reason that it is not a Miracle Drug.

MAKE A FAST BUCK by inventing. The National Inventors Council, Washington 25, D. C., has lists (sent to you free) which describes things needed to be invented. A cursory leer might reveal: a substitute for feathers; material for arctic gloves resistant to petroleum products; inexpensive converter of ice and snow into drinking water; wire splicers; adhesive for explosives; field produced foam filler for floats; and several hundred others. These are all technical problems affecting national defense which you or some one is going to invent. The things which are invented will play an important part in your life, and/or many other people like you who will use them. Write for the list of articles and their qualification-specifications; think; develop; invent. TOF sees no reason why practical biologists, who have had many survival experiences, would not be excellent advisors for inventing some of these items listed.

BIOLOGICAL COINAGES—ACTH (adreno-corticotrophic hormone) commercially from hogs, for treatment of arthritis, rheumatic fever and others . . . ANTIBIOTIC drugs produced from plant growth for infectious disease treatment, e.g., 1. aureomycin; 2. chloromycetin, specially treating typhus, also produced synthetically; 3. cortisone, similar to ACTH; 4. penicillin, a pale yellow powder, mold derived, most widely used antibiotic; 5. terramycin . . . BENTHOSCOPE hollow steel ball, for "Benthos" Greek for sea bottom, "Scope" to see . . . CLOUD SEEDING, scattering particles; dry ice, silver iodide, or water droplets into clouds, producing rain or snow . . . DDT (dichloro-diphenyl-trichloroethane) insect killer . . . DETERGENT a synthetic displacing our greatest commercial scrap fat supply . . . ELECTRON MICROSCOPE, photographing microcosmic structure with focused electron beams . . . GAMMA GLOBULIN, blood plasma extract, prevents measles contraction . . . GERIATRICS (no doubt too late for TOF, but he loves each one, God's blessing to them) study of needs and well-being of elderly people . . . HYDROPONICS, plant growth in chemical water solutions . . . IONOSPHERE, atmosphere thirty miles up . . . ORLON, synthetic fiber resembles both wool and silk . . . RADIOISOTOPE (radioactive isotope), activated atoms for physiology study . . . SMOG (smoke-fog), object of extensive research, sign-of-

times, human and planimal habitat determiner . . . TRACER, one of many radioisotopes followed by biologists thru plant and animal structure, tagged atoms . . . ULTRASONIC, sound wave frequencies too high pitched for human auditory detection.

DECODE this pottage of garbled verbiage and wireless your comments with a three-cent stamp to THE OLD FOSSIL, 5061 North Saint Louis Avenue, Chicago 25, Illinois. ADDENDA: the junior member of the firm, Myrl Annette, 8A, who gets twenty-five cents per error proofreading this, states: "If the person that checks this does not pencil a couple in here, whoo-ee."

Biological Briefs

MERCER, FRANK L. Chlorophyll: Trends in Current Therapy. *The Science Counselor*, Vol. xv, No. 3, p. 101, September, 1952.

Chlorophyll has been found to possess therapeutic values. This paper deals with the pharmaceutical and medicinal application of water-soluble chlorophyll products, chlorophyllins.

In recent years, the use of chlorophyll for medicinal purposes has been widely publicized. It has been used to treat chronic suppurative conditions, to accelerate healing, to treat leg and peptic ulcers, and to reduce odors. Present evidence indicates that chlorophyll enhances tissue resistance by an effect on the normal repair mechanism.

"Chlorophyll administered to human beings and animals either topically, orally, or parenterally appears to be non-toxic, and free of side reactions."

"Westcott, 1950, concluded that chlorophyll is non-toxic and that it effectively neutralizes mouth odors, perspiration odors, and many urine odors. Tebrock, reported an effectiveness of 84% in the control of breath and perspiration odor when 200 mgm. of specially prepared chlorophyllins were administered daily. One difficulty encountered in deodorant studies is the measurement and standardization of odors."

Many new products containing chlorophyll have been marketed. They included a medicinal spray-bomb, mouth washes, tooth pastes, soaps, shampoo, cigarettes, and gum.

Twenty-seven recent literature citations are included.

NEWMAN, ROBERT J. Wings Across the Moon. *Audubon Magazine*, Vol. 54, No. 4, July-Aug., 1952.

Six years ago George H. Lowery, Jr., Curator of Louisiana State University Museum of Zoology began trying to find out whether any birds return-