



SOCIAL IMPLICATIONS
OF BIOLOGY

21st annual meeting

MONMOUTH COLLEGE

OCTOBER 7-8, 1977

P R E S I D E N T I A L P A L A V E R

While returning home from our AMCBT meeting in Des Moines, your new president, Bill Brett, pointed out to me that this organization, unlike others he has been associated with, is made up of members who cooperate and are willing to work. We agreed that, as a consequence, the jobs of those responsible for our Annual Meeting are made much easier.

There were a great many involved in this '76 program who I wish to thank for their contributions. However, when I began to add up the number of 13¢ stamps required for me to do this by letter, my Scotch ancestry directed my seeking out another method. (Note Scotch is capitalized.) Also by doing it through our MIDWEST BIOSCENE the entire membership will know who deserves our thanks.

My heartfelt appreciation goes to Phyllis Kingsbury - program chairman, Lane Wilson - local arrangements, Leland Johnson - his participation and arranging for Dr. Jahn's appearance, and Drake University as our host institution. Dr. Jahn's films were excellent, a fitting conclusion to his presentation with that beautiful sense of humor.

There were 45 people involved as leaders in the group discussions in addition to Jack Bennett, George Garolan, Ellen Korn, and Ed Kos on the afternoon panel. And then there were the recorders, also the members of the Steering Committee who began work on this program with Phyllis Kingsbury 21 months ago. There must be almost a week's wages in postage right there, and who have I missed? Many individuals;

But looking forward rather than backward; it will require this continued cooperation for another successful meeting in Monmouth next October 7-8. President Bill Brett and program chairman Don Scoby will appreciate the help of all of you as much as I have this year.

Russel Wagner
Past President

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A sage once said, "To predict the weather of tomorrow just look at what you have today and that is it." In the field of biology, one should change that to read, "Look at the research that is going on today and you will have a rather good idea of what the biology of tomorrow will look like." In doing this, the future of biology is both exciting and frightening because the future holds promise for tremendous improvements in medical health, food production, energy production and other areas of human endeavor; frightening because we are entering areas of research, such as genetic engineering and fusion energy, which hold immense opportunities for improving humans but also hold equally immense threats of destroying humans. The history of human discoveries suggests that once something arrives on the scene we have little choice about whether we use it or not. That which one person can visualize, another person further along the line will insist that we must use.

Charles L. Gehring & William J. Brett.

Conversational Biology. Burgess, Minneapolis, 1975.

p. 195.

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with which the authors are affiliated.

MARINE AQUARIUMS

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The marine aquarium can be a very rewarding and stimulating experience for the student as well as the teacher. It is a beautiful sight to see red and white striped banded coral shrimp (*Stenopus hispidus*) walking across the coral and shell bottom. Coral heads, which are scattered on the bottom, are the home of anemones of various colors. A clown fish, such as the beautiful pecula clown fish (*Amphiprion ocellaris*) with its orange and white stripes, lazily hides in the poisonous tentacles of the anemones. Nudibranches slowly move along. This is but a small sample of the world you can introduce into your own educational environment. In addition to improving the appearance of the classroom the marine aquarium is also an excellent educational tool.

You say you tried setting up a marine aquarium before, and you had terrible results. Don't despair! The quality of fish handling from the collection of fish to their confinement in the retail store has improved greatly in the last several years. More and better products have been developed and the quality of the salt mixes has improved greatly.

You can teach many subject areas from just one tank because you have a completely closed eco-system right in your classroom. To successfully maintain a marine aquarium requires a knowledge of the needs of the system plus proper original set-up. The set-up is the most important factor for success. The aquarium itself should be as large as financially possible. It should not be under twenty gallons in capacity. Long tanks such as the 20L, 26L, 30L, 40L, or larger, are preferred over high tanks because long tanks provide a much greater water surface area for air contact. Modern all glass aquarium construction with silicone sealant seams is necessary for the marine aquarium because of the corrosive effect of salt on metal. The reason for the large tank size is not for the mere survival of the organisms, but, in fact, serves two basic purposes. First, the greater the amount of water present, the greater the tolerance of organisms to a fluctuation of contaminants in a tank. Contaminants include variations of pH levels, salinity, nitrate/nitrite levels, and so forth. Contaminants must not exist at high levels in a tank or harm will come to the tank inhabitants. The second criteria for a large aquarium is that most marine fish are very territorial and will claim a particular area for themselves. They will protect it at all costs. So the more space available, the better it is for the comfort and safety of the organisms involved.

One method of introducing new fish into a tank already containing fish with pre-established territories, is to take any objects in the tank, such as coral pieces or shells, and simply move them around in the tank. Thus, new territories must be established by all fish in the tank.

The underground filter is a major requirement of the salt water aquarium. It is the basis for the entire biological filtration system that is essential to the marine tank. A tank that is going to do its best must have a good biological filtration system. This biological system is set-up in the substrate level of the tank which is placed above the underground filter. This substrate material should be two to three inches deep and should consist of either crushed marble, calcite/limestone gravel, or any other gravel-like material that will help maintain and buffer pH levels within the 8.0 - 8.2 range. A pH level of 8.3 is considered neutral for salt water. The flow rate of the undergravel filter should be as high as possible. A good air pump is also needed to operate the system correctly. To connect the air pump to the undergravel filter, air line tubing and an air valve system must be used. The air valves should be plastic and have four or five

outlets. In addition to the undergravel filter, an outside power or air filter has an important function in the removal of suspended particles in the water. In addition, it provides water turbulence that many reef fish are accustomed to. Plenty of coral should be used above the substrate level to provide adequate hiding places for all organisms.

Some sort of tank covering, preferably a plastic full hood with fluorescent bulb, is needed to cover the tank and keep fish in and students out. The light also helps maintain algae, necessary for a well established tank. Since most of you will be establishing the tanks in laboratories, you should put the tank on a level area away from the windows or areas where the tank receives direct sunlight. The tank should not receive cold drafts and a heater in the aquarium should be set to keep the temperature at about 20° C. At this temperature the specific gravity of salt water should be 1.020. A hydrometer is used for this measurement. A new, very valuable, apparatus being used in the maintenance of marine aquariums is an ultra-violet sterilization unit. These units pass the water close to an ultra-violet bulb which will kill many harmful bacteria and parasites. These would be harmful to the organisms of the aquarium if allowed to go unchecked.

A good grade of synthetic salt should be used in setting up the salt water. I would recommend either Hawaiian Imports or Forty Fathoms Salts. After you have assembled all of these materials and have the tank operating, place any coral pieces or shells in the tank. Only cured coral should be used. Do not do anything else. Let the tank run for approximately three days before you interfere. Next, pollute the tank with small quantities of food. This will allow the nitrogen cycle to start. Within ten days, the nitrogen will reach a peak and level off. This cycling can be tested with a nitrate test kit. Once the cycling is finished, your aquarium is ready for life. You should go slowly at first and introduce one or two healthy organisms into your tank. Allow them to become acclimated to the tank and give time for the biological filter to catch up with the new waste load. With a few minutes of maintenance every few days, your salt water tank will be extremely rewarding to you as well as a great instructional aid in your class.

To improve your success in establishing marine aquaria the following check list will be helpful.

1. Set tank on strong level area. (Tank will weigh approximately 10 lbs./Gallon)
2. The tank should not receive direct sunlight. Don't forget the sun shifts position throughout the year.
3. Wipe tank with a clean towel and water only. No soap. Let dry.
4. Assemble undergravel filter, following directions on box.
5. Place undergravel filter on bottom of tank.
6. Wash gravel thoroughly. Place approximately 4 lbs. of gravel in a clean bucket, no soap, and run water into bucket, stirring until water runs clear.
7. Place clean gravel into tank, spreading it level, 2 or 3 inches deep, on the bottom.
8. Start to fill the tank with water. Fill only about $\frac{1}{2}$ full.

9. Place any decorative coral, plastic plants, or rocks. Try to make as many hiding places as possible for the future occupants. All coral must be cured by boiling in water, soaking in undiluted household chlorine bleach for $\frac{1}{2}$ hour, and then soaking in plain water for 48 hours, finally rinsing thoroughly in tap water.
10. Attach the air system. Run from uptake of undergravel filter to valve system and from valve system to pump.
11. The air pump should be set above the final water level to protect from water siphoning into pump. Start air pump. All undergravel uptake tubes should be bubbling.
12. Finish filling aquarium with water.
13. Add the salt to the aquarium. Add only about $\frac{1}{2}$ of the required amount for the tank capacity. Do not forget all gravel and decorative materials displace water. Allow the salt to dissolve for twenty-four hours.
14. Place the outside power or air filter on the back of the aquarium.
15. Put filtering material in outside filter. One layer of filter floss on the bottom of the filter, a layer of activated carbon and a layer of filter floss on top. Change only part of the carbon at a time to prevent shock to the system. A hint is to make carbon filter packets with nylon stockings. Put two in the filter at first, but change only one at a time at two weeks intervals. Make sure the carbon is rinsed before using to remove dust.
16. Prime the filter according to directions that accompany it and start operation.
17. Affix the ultra-violet sterilization (if available) and start it in operation.
18. Place the hood on the tank, making the proper adjustments so the outside filter operates unhampered and air lines are not blocked.
19. Check the salinity of the water with a hydrometer after 24 hours. Correct the salt level until it reads 1.020 on the hydrometer by adding more salt, allowing time for each aliquot to dissolve before adding more.
20. The tank should be completely set-up at this time. Salt water, decoration, light, hood, ultra-violet sterilizer, outside filter, air, and undergravel filter.
21. Allow the tank to run 3 days.
22. Contaminate the tank with a small amount of fish food or substrate from an established tank.
23. Test the nitrate level of the tank with a test kit once a day. The nitrate should peak in about ten days, then level out near zero. The pH should be near 8.2. Once the tank has leveled out it is ready for organisms. Do not overload the tank but add one or two organisms to the tank. Wait several weeks and add a few more. Because of the high visibility of salt water organisms compared to fresh water organisms and the intolerance to environmental changes, DO NOT OVERCROWD YOUR TANK. Leave at least five gallons of water volume per organism.

ANATOMY AND DEVELOPMENTAL BIOLOGY

A Summary of a discussion group at the 20th Annual Meeting of ANCBT

Karl Goellner, Coe College - Leader

James E. Henry, Illinois Central College - Recorder

Nine participants engaged in an informal discussion of developmental biology. Although much of the discussion, per se, centered around textbooks, many good thoughts were presented. Dr. Goellner presented several questions for thought:

1. Should anatomy or embryology come first in the Developmental Biology course?
2. Should anatomy be a separate course? Should Developmental Biology be a separate course? Should both be combined in a single course?
3. Should developmental anatomy be descriptive, morphologically oriented, or should it be molecular?
4. What's become of histology?

In regards to the above questions several thoughts were considered:

1. It was generally agreed that students with any anatomy background find embryology more acceptable and easier to understand. One major problem confronted by all was the student enrolling in a Developmental Biology course without the pre-requisite background.
2. As to whether a course should be morphology or molecular the group agreed that one must first consider to whom the course is being taught.
3. There seems to be a trend away from histology courses. Problems of micro-technique were discussed. Traditionally, histology courses were left to the medical schools; however, reports from students indicate medical schools expect them to be prepared, histologically speaking. What about the non-medical student and his/her need for histology?

A rather long discussion ensued relative to the use of live materials for the study of development rather than the traditional use of a set of prepared slides. Several excellent manuals are available. It was brought out that students need to study morphology but also need to see morphology in living situations. The drift of the discussion was that one should not be afraid to try live experiments, regardless of one's background or experience.

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ENERGY ALTERNATIVES SEMINAR - A regional seminar on energy alternatives was held February 4-5 at Ottawa University in Ottawa, Kansas. The program included a discussion of the energy picture in Kansas, a demonstration of the ENERGY SIMULATOR (an electronic game), and a comparison between coal based energy (as at La Cygne, Linn Co.) and nuclear energy (as proposed for Wolf Creek, Coffey Co.). Speakers were drawn from government agencies, utilities, and universities. The symposium was sponsored by the Lake Region Resource, Conservation, & Development Project and by the Environmental Studies Program at Ottawa University. William Gilbert, director of Environmental Studies Program at Ottawa University planned the meeting.

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TAKE TIME OUT NOW TO PUT IN YOUR INPUT

Committees solicit input and assistance from the membership.

USE THE ENCLOSED PINK INFORMATION BLANK

BIOLOGY INTERFACING WITH NON-HEALTH CAREERS

A Summary of a discussion group at the 20th Annual Meeting of AMCBT

Terry Gillespie, Highland Community College - Leader
 Leland Hansen, Highland Community College - Leader
 Daryl C. Stuhr, Illinois Valley Community College - Recorder

The emphasis of this discussion was the importance of getting information to biology students and helping to counsel them concerning non-health careers, an area where there is a noticeable lack of knowledge and information. Biology majors with a good minor in some other area, such as math, chemistry, agriculture, accounting, etc., would do well to consider biological careers which overlap with other disciplines. With supply vs. demand continually fluctuating in the various areas and fields of the job market, there are possibilities of both teaching and non-teaching jobs in schools, of jobs in government (including military service), in business, in management, in agriculture, etc. Graduates would not expect to start out at high-level positions with high salaries. They need to realize the importance of making contacts and getting experience, even in part-time jobs. Prospective employers place much emphasis on skills and competencies. Beware of employment agencies, and of want-ads that can be misleading.

Two valuable sources of information are the College Placement Annual from the College Placement Council, Inc., Box 2263, Bethlehem, PA 18001; and the annual Occupational Outlook Handbook from the Supt. of Documents, U.S. Government Printing Office, Washington, DC 20402. Numerous other sources (Free and low-cost) are available from a variety of agencies and organizations.

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HAVE YOU HEARD ABOUT?

HEALTH EDUCATION CHRONOLOGY Did you know that in 1785 porcelain teeth were first introduced in the United States? Did you know that the Philadelphia yellow fever epidemic of 1793 inspired improvements in sanitation and water supply? Or that X-rays were first used to treat cancer in 1896?

Now available for purchase is a 24 x 36 Bicentennial chart printed on both sides of high gloss stock. The colors are red, white and blue and the information a 200 year chronology of events that place us where we are today. "Health Education Forces and Factors Evolving Concepts - 1776-1976" was co-authored by two Illinois State University health educators after many months of research.

Purchase of the chart may be made by sending check or money order in the amount of \$4.00 (includes postage) payable to:

Illinois State University Foundation
 c/o Department of HPERD
 201 Horton
 Illinois State University
 Normal, Illinois 61761

AMCBT INITIATES AWARD PROGRAM FOR SECONDARY BIOLOGISTS

As a result of the work of a study committee composed of Janice Kemp, Charles Gehring and Ben Olson, and Steering Committee action, AMCBT is embarking on a new program. Awards will be made to secondary students for excellence in biology.

The award will be a joint presentation from the Association and an institution of a local AMCBT member. The awards will be made on the basis of a set of guidelines established by the Steering Committee and nomination by a secondary school biology teacher. A certificate will be presented to each awardee.

Institutions wishing to cooperate in this endeavor will be expected to notify local secondary schools of their choice concerning the award, select the nominee from each school whom they consider worthy of the award, make the presentation and supply appropriate information to local news media.

It is the thought of the Association that such awards may have many values. They will serve to recognize and motivate potential biologists. They will offer a degree of community visibility to the work of the local college biology department. They will provide a source of information concerning highly desirable prospective students. In turn, the visibility of AMCBT should be increased throughout the region.

If you and your institution wish to participate in this award program write to the Central Office for further information. Copies of an announcement suitable for mailing to the secondary school, guidelines for selecting awardees and a copy of a suggested press release are available. Certificates will be printed by the Association but must be completed by the local institution. The certificate will carry the name of the Association and the name of the local institution.

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IUPUI SEMINAR - The National Association of Biology Teachers (NABT) and the Indianapolis Center for Advanced Research (ICAR) are again sponsoring a seminar for teachers of science and their students on the theme, BIOLOGICAL REALITIES and their Social Significance. The specific topic will be SURVIVAL ETHICS. Some of the program topics are:

- * The Dangerous Position of the Science Teacher: "Truth" and Controversial Scientific Issues
- * Recombinant DNA and Plasmid Research: What's Going On and Why?
- * Political Influence on Scientific Research: Who's Really Calling the Shots?
- * Fetal Research: The Undefined Civil Rights of the Unborn
- * Beyond Scientific Competency: The Peter Principle and the Scientist
- * Dwindling Resources: Can Selfishness Be a Virtue?
- * State and Federal Support for Profound and Catastrophic Diseases: What Are We Creating?

There will also be a one half day workshop in the development of practical implications of the seminar theme in the classroom.

The seminar will be held April 18, 1977 in Indianapolis.

For additional information write to: Dr. Wendell F. McBurney

Associate Dean, Research & Sponsored Programs
Ind. Univ. - Purdue Univ. at Indianapolis
355 Lancing Street
Indianapolis, IN 46202

AMCBT NEEDS YOU

There are many ways in which individual members can contribute to AMCBT. This participation by a high percentage of the membership is essential to the success of the Association. A major avenue with which you are all familiar is through the program of the Annual Meeting. Enclosed with this issue of MIDWEST BIOSCENE is a response sheet. Take time out now to look it over, think about what you could do, and get it back in the mail. A month from now is too late. A successful program in October requires a great deal of work from the program chairman and others in the winter and spring.

Less noticeable but still a great value is input in the form of suggestions for nomination for the various offices. You can include these in the response sheet. Don't forget that any member can prepare a nomination for Honorary Life Membership. If you know of someone whom you think should be so honored, start to work now. If you do not have a copy of the procedures, request them from the Central Office or the chairman of the Honorary Membership Committee, Russel Wagner.

There are many ways to help out AMCBT and other college biology teachers. Pass on your copy of MIDWEST BIOSCENE to a prospective member, think now of arranging a travel pool to Monmouth - and include a new member or two in the pool. Participate in the new high school award program announced in this issue. Describe some aspect of your program, your field station, a laboratory procedure, a teaching technique - anything, and send it to MIDWEST BIOSCENE. Something which you view as being run-of-the-mill routine may well be just the idea one of your colleagues is looking for. Share!

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HUMAN RIGHTS AND SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENTS
(From the AIBS Communicator Vo. 3, No. 1, January, 1977)

At a September meeting at United Nations (Geneva) there was a recommendation for the drafting of a Declaration on Human Rights and Scientific and Technological Developments, with special emphasis upon "population planning (quantitative and qualitative) in relation to the right to found a family; protection against the hazards of the use of atomic energy; human experimentation; implications of new biological and medical discoveries (e.g., (a) tissues and organ transplantation and the use of artificial organs, (b) genetic manipulation of microbes, and (c) potential modifications of human genome); modification of mental processes by medical means; the social and ethical implications of the extension of life and of new definitions of and attitudes to death, and social and ethical choices in relation to equality in the provision of health protection and medical care."

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GUEST AUTHOR *Michael Surma, author of the article on marine aquaria, is a faculty associate at Illinois State University, teaching biology in University High School. For the past three years he has managed a large retail and wholesale pet supply firm. He has dealt directly with major marine aquaria equipment and livestock suppliers. He participated in numerous seminars on marine aquaria. In conjunction with the retail portion of the business he set-up and maintained over 1,000 gallons of salt water aquaria. In addition he assisted many customers in establishing and maintaining their units. Mike will be glad to correspond with any AMCBT members having questions or problems concerning salt water tanks.*

POSITIONS WANTED Reply to the position number in care of AMCBT Central Office.
Service is free to members. Others may use the service for a fee of \$1.00 per line of copy for each issue.

7701 BIOLOGY GENERALIST Seeks teaching position at 4-year or community college. Some research possible. D.A. 1976 general biology; M.S. 1973 ecology; B.A. 1969 general biology, genetics and development. Three years teaching experience including lab-lecture, A-T, individualized learning and adult education. Iowa or southern Minnesota preferred. Available immediately.

7702 GENERAL BIOLOGIST Master's degree, 8 years teaching experience, sec., college, and continuing ed. Interested in: biology for the non-major, science and human values, environmental studies, interdisciplinary science, methods, anatomy and physiology. Presently on temporary appointment.

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CULTURAL PURE STRAINS

(From the AIBS Communicator Vol. 3, No. 1, January, 1977)

Among the lessons we must learn from research on genetics is the danger inherent in breeding "pure strains." The imposition of Western culture upon the remainder of the world is no less insidious than the development of one strain of wheat or corn which, in time, becomes susceptible to various diseases and climatic conditions. The extent to which the world has committed itself to such a planting dictates the degree of famine arising from one unfortunate incident. We have learned the value of maintaining genetic "banks" of early maize and those forms which evolved in the normal struggle for survival. Even so, there are cultures and customs which represent the "seed corn" of our own. They must be respected, even preserved, for their potential for strengthening and refurbishing of our system as its pervasive growth endangers more and more of the world.

-----Detach Here-----

Application for Membership
ASSOCIATION OF MIDWESTERN COLLEGE BIOLOGY TEACHERS

Regular Member (\$6.00) Retired Member (\$3.00) Dues payable July 1

Name _____ Date _____

Title _____ Department _____

Institution _____

City _____ State _____ Zip _____

Address preferred for mailing _____

City _____ State _____ Zip _____

Return to:
AMCBT Central Office
c/o John R. Carlock
Illinois State Univ.
Normal, IL 61761