

## GENERAL SCIENCE

# Science Fair Award Winners

National Science Fair-International honors were awarded to top young scientists in fields including botany, chemistry, space sciences, medicine, physics and mathematics.

## See Front Cover

► THE MOST PROMISING teen-aged scientists of the year received top awards at the Awards Banquet of the 15th National Science Fair-International at Baltimore, Md.

Two hundred and ninety-seven awards were made in botany, chemistry and biochemistry, earth and space sciences, medicine and health, physics, mathematics and computers, and zoology. The winners were selected from 420 NSF-I finalists representing 222 affiliated fairs.

Seen on this week's front cover are the 27 happy winners of the First and Second Awards.

First Awards were presented to:

Toshiko Matsumaru, 17, Chiba Girls' H.S., Chiba, Japan, for her project "Research on the Pollen of *Lilium longiflorum*";

David R. Gibbs, 16, Garfield H.S., Terre Haute, Ind., for "Antibiosis Study of Fresh Water and Marine Algae," also a finalist at the 14th NSF-I;

Judith Herzfeld, 16, Martin Van Buren H.S., Queens Village, N. Y., for "Spectropolarimetric Analysis of the Secondary Structure of Gramicidin-S and Tyrocidine-A," also the winner of a U. S. Army first award;

Charles Griffith Taylor, Jr., 18, Glynn Academy, Brunswick, Ga., for "Control of Anthocyanin Synthesis by the Photoreceptor System," also the winner of a U. S. Army first award;

Martha Eleanor Matter, 16, Washington-Lee H.S., Arlington, Va., for "Jupiter—Composition, Structure, Origin," also the winner of a National Aeronautics and Space Administration award;

Richard E. Albrecht, 18, Parkersburg H.S., Parkersburg, W. Va., for "Atmospheric Refraction of the Low Sun," also winner of a U. S. Army first award and the Optical Society of America second award;

Patricia N. Schultz, 17, Faribault Sr. H.S., Faribault, Minn., for "Mutagenic Effects of Ultraviolet Radiation on a Strain of *Bacillus subtilis*," also winner of the second award of the American Society for Microbiology and a finalist at the 14th NSF-I;

Robert James Brock, 17, Arlington Heights H.S., Fort Worth, Texas, for "Determination of Suppressor Gene Loci in *E. coli* K-12," also a U. S. Navy Science Cruiser, a U. S. Air Force alternate winner and a finalist at the 14th NSF-I;

Kevin J. Glading, 16, Albany H.S., Albany, Calif., for "Nuclear Quadrupole Resonance Effects," also winner of a U. S. Air Force first award;

Amory Bloch Lovins, 16, Amherst Regional H.S., Amherst, Mass., for "A New Nuclear Magnetic Interaction," also the winner of first awards from the U. S. Army,

U. S. Navy and U. S. Atomic Energy Commission; previously a finalist at the 14th NSF-I and one of the 40 winners in the 1964 Science Talent Search;

Erik Olin Wright, 17, Lawrence H.S., Lawrence, Kans., for "Analysis of the Total Number of Twists Resulting from Cutting any Order Moebius Band with any Number of Cuts," also winner of a U. S. Army first award and a 14th NSF-I finalist;

Joan Marie Keene, 17, Bethlehem H.S., Bardstown, Ky., for "Germ-Free Chicken Experimentation," also winner of a U. S. Atomic Energy Commission first award and a finalist at the 14th NSF-I;

Philip Y. Paden, 18, Lawrence H.S., Lawrence, Kans., for "Stimulus Induced Changes in the Synaptic Complex," also a winner of an American Institute of Biological Sciences first award and a 14th NSF-I finalist.

All of these winners will receive "Wish Awards" of \$100 of scientific equipment or books of their own choice.

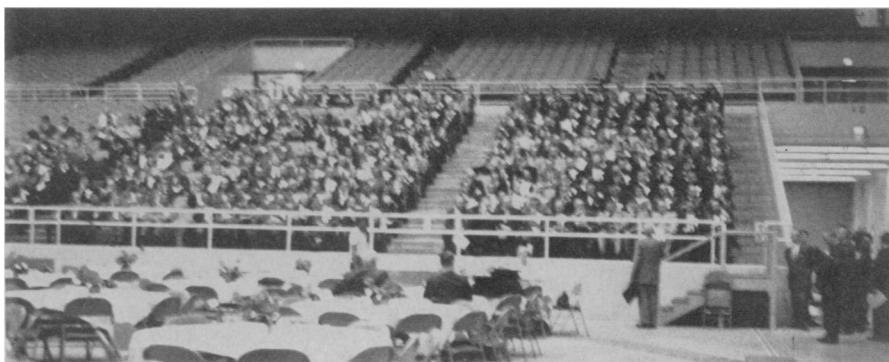
## Winners of Second Honors

Second honors and \$75 Wish Awards went to: Jo-Ida C. Hansen, 16, Jamestown H.S., Jamestown, N. Dak., "Evaluation of CO<sub>2</sub> and O<sub>2</sub> Production by Aquatic Plants in a Closed Ecological System Under Controlled Illumination"; Stephen A. Ferreira, 17, Kauai H.S., Lihue, Kauai, Hawaii, "Answers to the 'Papaya Replant Problem'"; Sandra Edfort, 16, West Side Central Catholic H.S., Kingston, Pa., "Immunoelectrophoresis"; Charles R. Tweedle, 15, South Shore H.S., Chicago, Ill., "Isotropic and Anisotropic Polymers"; Judith L. Herr, 18, Northeast H.S., St. Petersburg, Fla., "An Analytical Study of a Martian Phenomenon"; Richard D. Bennett, 17, Norte Del Rio H.S., North Sacramento, Calif., "The

Making of a Ramjet"; Barbara E. Marzocchi, 17, Cumberland H.S., Cumberland, R. I., "Possible Site of Action of Hormones in *Tetrahymena pyriformis*"; Frederick R. Aronson, 18, Pascack Valley H.S., Hillsdale, N. J., "Behavioral Tests of Offspring from the 25th Generation of X-Irradiated Mice"; Robert R. Spencer, 16, Woodbury Central Community School, Merville, Iowa, "Production and Testing of Avian Bronchitis Vaccine"; Allan F. Divis, 18, Palo Verde H.S., Tucson, Ariz., "Stoichiometric Doping of Intermetallic Thermoelements"; Laidacker M. Seaberg, 17, Forest Park H.S., Beaumont, Texas, "Design of Autogyros"; James A. Nathanson, 17, William Hall H.S., West Hartford, Conn., "ESP—Fact or Fiction"; Marilyn E. Newhouse, 17, Ramey H.S., Ramey AFB, Puerto Rico, "The Voice of the Coqui"; Paul S. Kaplan, 16, Lebanon Sr. H.S., Lebanon, Pa., "Inducing Pregnancy by Artificial Insemination in C-57 Mice."

## Third Award Winners

Third Awards and \$50 Wishes went to: Tamzon D. Feeney, 14, Academy of Our Lady of Peace, San Diego, Calif.; Bruce D. Gaddis, 17, Tulsa Central H.S., Tulsa, Okla.; Dorothy E. Sanders, 17, Many H.S., Many, La.; David A. Shannon, 17, Choteau H.S., Choteau, Mont.; Gail B. Halpern, 17, Long Branch H.S., Long Branch, N. J.; Anders Persson, 19, Goteborgs Hogre Samskola, Gothenburg C, Sweden; Mary K. Malins, 17, Incarnate Word Academy, Corpus Christi, Texas; Alice S. R. Reichardt, 16, Oliver P. Morton H.S., Hammond, Ind.; Wilson A. Clark, Jr., 17, Grainger H.S., Kinston, N. C.; Benny W. Ribelin, 17, Melbourne H.S., Melbourne, Fla.; Thomas M. McGahee, 17, Central Catholic H.S., Melbourne, Fla.; Kaoru Shii, 20, Owada Technical H.S., Nagata-Ku, Kobe, Japan; Douglas A. Lind, 17, George Mason Jr.-Sr. H.S., Falls Church, Va.; Larry A. Solomon, 17, Scarsdale H.S., Scarsdale, N. Y.; Karen L. Cray, 16, Atchison H.S., Atchison, Kans.;



Science Service

**MORE THAN 350 JUDGES SPEND A DAY AT NATIONAL SCIENCE FAIR-INTERNATIONAL—Scientists and engineers in many fields from the Baltimore area are receiving hints on the task they are to undertake as volunteers. Each of the finalists was interviewed by at least five judges who often gave advice on their future careers.**

David L. Abel, 17, Northwestern Sr. H.S., Hyattsville, Md.

#### Fourth Awards

Fourth Awards and \$25 Wishes were given to: Carl M. Abramson, 17, Pineville, N. C.; Sonia Adrouny, 16, New Orleans, La.; Marilyn Beech, 15, Atlanta, Ga.; James W. Behrens, 17, Bunker Hill, Ill.; David A. Bellomy, 16, Barstow, Calif.; Virginia Lynn Betz, 17, Baltimore, Md.; Charles R. Bokesch, 17, Frederick, Md.; Susan R. Bowen, 17, Front Royal, Va.; Robert B. Bradley, 17, Jacksonville, Fla.; David E. Brown, 17, Atherton, Calif.; David A. Clary, 17, Lafayette, Ind.; Joseph K. V. Comeau, 17, Champlain, N. Y.; William R. Coyle, 17, Huntington, W. Va.; Francesca J. Cuthbert, 17, Mt. Pleasant, Mich.; Alan R. Cutler, 17, Auburn, Mass.; Virginia L. Delaney, 16, Framingham, Mass.; Oliver E. Dial, Jr., 16, Chula Vista, Calif.; Lola A. Dickson, 15, Hatch, N. Mex.; Andrew L. DiRienzo, 17, Pine Plains, N. Y.; Susan C. Doherty, 17, Wichita, Kans.; Avril Doucette, 16, Pampa, Texas; Stephen C. Drew, 17, Anchorage, Alaska; Eric M. Dulberg, 16, New Orleans, La.; James A. Durst, 16, Mandan, N. Dak.; Sharon A. Fair, 17, Albuquerque, N. Mex.; George F. Fargher, 17, LaPorte, Ind.; Nancy Fering, 16, Sleepy Eye, Minn.; Charlotte A. Ford, 17, Lacey, Wash.; Arthur E. Frankel, 16, Austin, Texas; Hudson Freeze, 17, Auburn, Ind.; Audrey J. Fussell, 15, Havre, Mont.; Suzanne M. Garszczyński, 17, Reading, Pa.; John R. Gott III, 17, Louisville, Ky.; Stephen W. Hales, 17, Ogden, Utah; Susan K. Hart, 17, Athens, Tenn.; Edmond J. Hay, Jr., 16, Sunbury, Ohio; Dorothy K. Heck, 16, Gallup, N. Mex.; Stephen Hellman, 15, New York, N. Y.; William C. Herrmann, Jr., 17, Dallas, Texas; Richard B. Holtz, 17, Ridgway, Pa.; Ingrid G. Hougland, 17, McLean, Va.; David R. Jefferson, 15, Beltsville, Md.; Donald L. Jones, 17, Kermit, Texas; Michael R. Jones, 18, Edmonds, Wash.; Richard R. Jones, 16, Copperhill, Tenn.; Ronald D.

Jones, 18, Welch, Okla.; Rhea L. Keller, 18, New Haven, Ind.; David E. Kieras, 16, San Angelo, Texas; Suzanne Kirk, 16, Fairgrove, Mich.; William D. Kopper, 16, Topeka, Kans.; Gregory K. Larson, 18, Medford, Wisc.; Jeffrey H. Loesch, 17, Montrose, Colo.; Melinda L. Lueth, 16, Everett, Wash.; Gregory S. Lumbrá, 17, Bloomington, Ind.; Phillip R. Lumpkin, 17, Weiner, Ark.; Karen M. Maeda, 18, Waianae, Hawaii; Carl L. Manley, 18, Selinsgrove, Pa.; Vance G. Marshall II, 18, Flint, Mich.; Neil R. McCanney, 18, Florissant, Mo.; Carolyn M. McGee, 17, Bethlehem, Pa.; Avrohm N. Melnick, 16, Bloomfield, Conn.; Brenda Melvin, 16, Jamestown, Ohio; Alice E. Mitchell, 16, Vinton, Va.; Margo Murray, 16, Jacksonville, Fla.; Rosemary Nagl, 18, Carroll, Iowa; John R. Neill, 16, Wilmington, Del.; Frederick M. Neill, Jr., 16, Memphis, Tenn.; Jonathan R. Pawlik, 17, Dearborn, Mich.; Thomas D. Poppendieck, 18, Glendale, Wisc.; Tony M. Quisenberry, 17, Quanah, Texas; Charles R. Reeve, 16, Hurricane, Utah; Spencer W. Roedder, 16, Bethesda, Md.; H. Grady Rylander III, 16, Austin, Texas; Joseph G. Saide, 17, Manchester, N. H.; Douglas S. Schaff, 18, Baltimore, Md.; Kirstan L. Schell, 17, Las Cruces, N. Mex.; Richard J. Shepler, 17, Jamestown, N. Dak.; David Shipman, 16, Cleveland, Okla.; Ruth Carol Silberman, 17, Chateaugay, N. Y.; Lee R. Girton Snyder, 18, Huron, S. Dak.; Joyce E. Solomon, 17, Columbia, S. C.; Erwin J. Stierle, 16, Ann Arbor, Mich.; Michael Swafford, 17, McFarland, Calif.; Kathleen M. Thomas, 17, Detroit, Mich.; Patricia A. Thomas, 17, South Euclid, Ohio; Mary C. Tillman, 16, Stillwater, Okla.; Donald W. Tubbs, 16, Lacey, Wash.; Linda Van Roekel, 15, Hawarden, Iowa; Dwight D. Walker, 17, Iowa City, Iowa; James D. Ware, 18, New Albany, Ind.; Leslie E. Webb III, 17, Falfurrias, Texas; Nancy L. Williamson, 17, Bryan, Ohio; Robert M. Willingham Jr., 17, Washington, Ga.; Alan E. Wittbecker, 17, Waynesboro, Va.

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## Questions

**ASTRONOMY**—When will this year's first total eclipse of the moon take place? p. 330.

**BIOCHEMISTRY**—Why are deaths from emphysema increasing as deaths from tuberculosis decrease? p. 329.

**GENERAL SCIENCE**—What is the second scientific revolution? p. 322.

**MEDICINE**—What dye may help test the extent and severity of a burn? p. 328.

**PHYSICS**—What basic assumption of modern physics was recently confirmed? p. 331.

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Science Service

**NATIONAL SCIENCE FAIR COUNCIL CHAIRMEN**—(Left) Newly elected chairman, Howard Weisbrod, supervisor of science education, San Diego, Calif., and (right) retiring chairman, Gordon B. Fister, associate editor, Morning Call, Call-Chronicle Newspapers, Allentown, Pa. The council of 21 members advises Science Service.

## GENERAL SCIENCE

# Special Award Winners

Outstanding finalists at the 15th NSF-I were selected by participating Federal agencies and professional organizations for special honors in their respective fields.

► JUDGING PANELS of specialists from Federal agencies and professional organizations selected outstanding finalists at the 15th National Science Fair-International for special awards in their particular fields.

The AMERICAN CHEMICAL SOCIETY gave First Awards to Dorothy E. Sanders, 17, Many H.S., Many, La., for "Detection, Identification and Isolation of Natural Pteridines and Their Effects on Embryonic Development," and to Alan R. Cutler, 17, Auburn, H.S., Auburn, Mass., for "Isolation of Sodium Superoxide from Sodium Ozonide." Both won plaques and \$100 awards to be used for science materials and study.

First alternate awards of plaques went to Kathleen M. Thomas, 17, Detroit, Mich., and Joseph K. V. Comeau, 17, Champlain, N. Y. All four students received subscriptions to the Journal of Chemical Education and their teachers received special plaques.

The AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES honored Frances Marie Hefelfinger, 16, Carlisle Sr. H.S., Carlisle, Pa., for "Effects of Gamma Irradiation: Induced Mutations on Snapdragons," and Philip Y. Paden, 18, Lawrence H.S., Lawrence, Kans., for "Stimulus Induced Changes in the Synaptic Complex." The winners each will receive expense-paid trips to the annual AIBS convention.

The AMERICAN INSTITUTE OF MINING, METALLURGICAL, AND PETROLEUM ENGINEERS, Inc., gave a First Award of a certificate and \$100 U. S. Savings Bond to Theodore Bernard Lerman, 17, Brooklyn Technical H.S., Brooklyn, N. Y., for "Tin—The Metal That Cries." Two finalists tied for the AIME alternate award, each receiving a certificate and a \$50 U. S. Savings Bond: William Horton Caskey, 18, Jonesboro, La., and Robert Marion Willingham, Jr., 17, Washington, Ga. All three will receive subscriptions to one of the AIME journals.

The AMERICAN PSYCHOLOGICAL ASSOCIATION gave a First Award of a certificate and \$100 U. S. Savings Bond to Marilyn Beech, 15, Fulton H.S., Atlanta, Ga., for "Does Mother Factor During Infancy Affect Growth and Behavior in Maturity?" Certificates of Merit were given to Ann Virginia Guthrie, 15, Kansas City, Mo.; Ruth Carol Silberman, 17, Chateaugay, N. Y., and James A. Nathanson, 17, West Hartford, Conn.

The AMERICAN SOCIETY FOR METALS gave a First Award plaque and \$100 to Erwin James Stierle, 16, Ann Arbor H.S., Ann Arbor, Mich., for "Design, Construction and Operation of the Field Ion Microscope." The second award plaque and \$75 went to John Richard Gott III, 17, Louisville, Ky.

The AMERICAN SOCIETY FOR MICROBIOLOGY gave its First Award plaque, Certificate of Merit and \$100 to further the winner's

career in science to Robert R. Spencer, 16, Woodbury Central Community School, Moline, Iowa, for "Production and Testing of Avian Bronchitis Vaccine." The second award plaque, Certificate of Merit and \$75 went to Patricia N. Schultz, 17, Faribault, Minn. Honorable mention plaques were awarded to Patricia Camille Murphy, 17, Memphis, Tenn.; Charles R. Bokesch, 17, Frederick, Md.; and to Mary Kristine Malins, 17, Corpus Christi, Texas.

The ENTOMOLOGICAL SOCIETY OF AMERICA awarded a \$100 U. S. Savings Bond and the current issue of the Annual Review of Entomology to Robert Steven Brown, 17, Bethesda-Chevy Chase H.S., Bethesda, Md., for "Fractionation of *Drosophila melanogaster* and Correction of Hereditary Diseases."

The NATIONAL AERONAUTICS AND SPACE ADMINISTRATION awarded Certificates of Merit and two-day visits to NASA facilities to winners in six categories: in Aerodynamics and Space Flight, awards went to Laidacker M. Seaberg, 17, Forest Park H.S., Beaumont, Texas, for "Design of Autogyros" and Joseph Russell Mosher, Jr., 15, Reese H.S., Reese, Mich., for "Effects of Rocket Flight on Training"; in Space Vehicles to Ronald DeWayne Jones, 18, Welch H.S., Welch, Okla., for "Micrometeoroid Erosion and Spacecraft Materials" and Virginia Mason Morris, 15, Columbia H.S., Richland, Wash., for "Mouse in a Closed Ecological Environment"; in Space Propulsion Systems to Donald P. Hutchinson, 17,

R. H. Watkins H.S., Laurel, Miss., for "Acceleration of Charged Particles for Space Propulsion" and to Richard Darrell Bennett, 17, Norte Del Rio H.S., North Sacramento, Calif., for "The Making of a Ramjet"; in Space Life Sciences to Judith Lauren Herr, 18, Northeast H.S., St. Petersburg, Fla., for "An Analytical Study of a Martian Phenomenon" and to Sharon Ann Fair, 17, Sandia H.S., Albuquerque, N. Mex., for "Sleep—A Habit? Rest—Necessary!"; in Space Physical Sciences to Alan Emerson Wittbecker, 17, Waynesboro H.S., Waynesboro, Va., for "General Mathematical Model of a Zwicky Humason Star" and to Martha Eleanor Matter, 16, Washington-Lee H.S., Arlington, Va., for "Jupiter—Composition, Structure, Origin"; in Space Electronics and Communications to David G. Taylor, 16, Middletown Township H.S., Middletown, N. J., for "Experiments in the Simplification of Television Image-Conversion and Transmission" and to H. Grady Rylander III, 16, Austin H.S., Austin, Texas, for "Simultaneous Oscillations in Negative Resistance Devices." Each of the 12 winners will name a teacher to accompany him on the trip.

(Continued on p. 333)

**SCIENCE FAIR WINNERS**—The 13 top winners with their exhibits at the 15th National Science Fair-International are shown on the following two pages.

Reading from left to right, top row: Kevin J. Glading, Martha E. Matter, Amory B. Lovins, Judith Herzfeld.

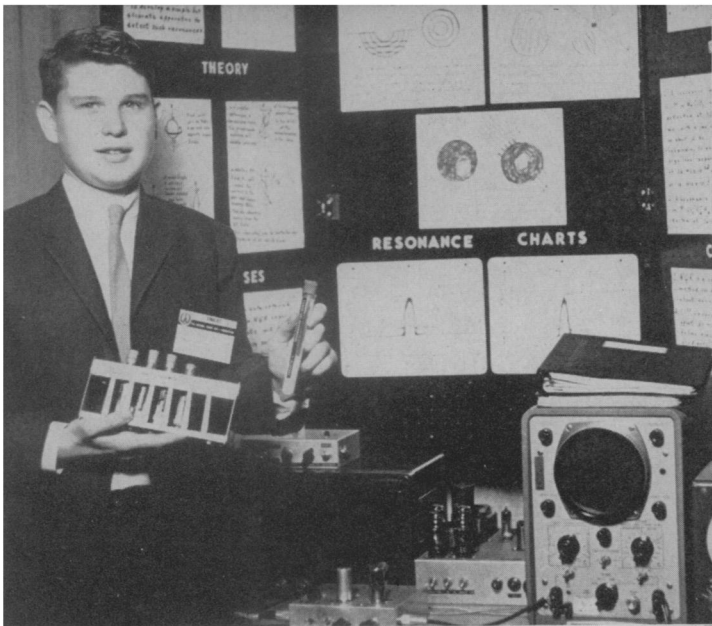
Middle row: Toshiko Matsumaru, Richard E. Albrecht, Charles G. Taylor, Jr., Patricia N. Schultz.

Bottom row: Philip Y. Paden, Erick O. Wright, Robert J. Brock, Joan M. Keene, David R. Gibbs.



Science Service

**TYPICAL SCENE AS OVER 400 EXHIBITS ARE PUT INTO PLACE**—Over 100,000 visitors saw the more than 400 exhibits during the two days the public was admitted to the Baltimore Civic Center during the 15th National Science Fair-International.



**RESEARCH ON THE POLLEN OF LILIA IN LON LORI**

My interest in seed germination... of have motivated this research. In order to... of its mechanism, I have created... pollen of *Lilium longiflorum* since 1950. My research has been done on the... pollen germination, on the influence of... external humidity on the ability of... various kind of plants under a certain... solvent.

**CONCLUSION**

The amount of ingredients found in each pollen grain is quite unequal from the physiological reasons for germination, and germination by itself is impossible. So the phenomenon of group effect appears because of the delicate relationship between... of the substance which is derived from... substance adhering to the outer membrane... pollen grain and promoting its germination... and the amount of the substance within the grain.

**PROJECT** Build a reflecting telescope and study low sun phenomena, particularly the atmospheric index of refraction (IR).

Designing and building the telescope required 950 hours of effort, 550 hours of which was used for grinding mirrors. The second mirror was made because I wanted to produce a superior quality mirror although my first mirror was average. See notebook for details. This telescope was equipped with a camera, and a graduated level for measuring observation angles.

**ATMOSPHERIC REFRACTION** The problem is determining the atmospheric IR was primarily related to calculating the sun's angle of incidence.

Fig I  
earth

Referring to fig I, the sun's rays are actually bent in a curved line as they go through the atmosphere. An object at point N will appear to observer at P in a position tangent to curve MN in line MP.  $\angle MPN$  is the refraction angle.

To make a practical calculation of  $\angle MPN$ , I assumed that point L was on the boundary of a uniform atmosphere 5 miles above the earth's surface. This was done as the depth of the earth's atmosphere if it were STP.

Fig II  
normal incidence angle  
boundary  
refraction

Referring to fig II, the angles must be measured from...

**AN INVESTIGATION OF THE NODE FORMATION THEORY**

**PURPOSE**

TO DETERMINE THE RELATIVE GENETIC LOCI OF THE SUPPRESSOR GENES ON THE GENOME OF THE ISOLATED SUPPRESSED STRAINS OF LEUCINE AND PURINE AUXOTROPHS UTILIZING VIRULENT T-6 PHAGE AS THE INTERRUPTIVE AGENT.

**TECHNIQUES**

## A NEW NUCLEAR MAGNETIC INTERACTIC DISCOVERED AND INVESTIGATED WITH HOMEMADE HIGH-RESOLUTION NMR SYSTEM

TECHNICAL  
ABSTRACT

BRIEF  
Nontechnical  
SUMMARY

BRIEF REVIEW OF NMR  
THEORY AND PRACTICE

THE RESEARCH WAS COMPLETED  
DURING RESEARCH DAY 1964-1965

PLEASE CONSULT THE ACCOMPANYING BOUND REPORT  
FOR DETAILS OF THIS RESEARCH.

TEN HOURS FREE  
HELP AVAILABLE

## SPECTROPOLARIMETRIC ANALYSIS OF THE SECONDARY STRUCTURE OF GRAMICIDIN'S AND TYROCIDINE-A

PROPOSED  
CONFORMATION

APPROACH

## CONTROL OF SYNTHESIS OF ANTHOCYANIN PIGMENTS BY THE PHOTORECEPTOR SYSTEM

- PROBLEM -

THE PURPOSE OF THIS RESEARCH IS TO DISCOVER THE EFFECTS  
OF LIGHT ON THE FIRST PHOTORECEPTOR FOR ANTHOCYANIN SYNTHESIS  
AND TO DETERMINE THE RELATION WHICH EXISTS AMONG COPPER AND  
IRON IN THE SECOND PHOTORECEPTOR AND ANTHOCYANIN SYNTHESIS

### RESEARCH DESIGN

- LIGHT EXPERIMENTS ON FIRST PHOTORECEPTOR
- EXPERIMENTS ON CATIONIC ASSOCIATION WITH SECOND PHOTORECEPTOR

## GERM-FREE CHICKEN EXPERIMENTATION

### PURPOSES

- 1 TO DESIGN AND BUILD AN EFFECTIVE GERM-FREE EXPERIMENTATION SYSTEM FOR THE MAINTAINING OF LIFE IN A CONTROLLED BACTERIAL ENVIRONMENT
- 2 TO REAR GERM-FREE CHICKENS AND COMPARE THEM WITH CHICKENS POSSESSING NORMAL MICROFLORA
- 3 TO DETERMINE THE EFFECTS OF THE GERM-FREE STATE ON THE SURVIVAL TIME OF CHICKENS EXPOSED TO SUPRALETHAL DOSE OF X-RADIATION

REARING GERM-FREE CHICKENS

## ANTIBIOSIS STUDY OF FRESH WATER AND MARINE ALGAE

### TEST RESULTS

ZONES OBSERVED  
ZONES OF  
INHIBITION NOTED

LZ = LARGE ZONE  
SZ = SMALL ZONE  
- = NO ZONE

### CULTURING INHIBITING SPECIES

A CONSTANT TEMPERATURE AND  
LIGHT CONTROL CABINET WAS CONSTRUCTED.