

# THE Ninth National Science Fair

Conducted by  
SCIENCE SERVICE  
WASHINGTON 6, D.C.



In Cooperation with  
150 AFFILIATED SCIENCE FAIRS

BALLINGER FIELD HOUSE

FLINT JUNIOR COLLEGE

FLINT, MICHIGAN

May 7-8-9-10



THE NATIONAL SCIENCE FAIR is dedicated to inspiring greater interest among students in the fields of pure and applied science.

The finalists, whose exhibits are listed, have won the right to present their creativity and research here, because they were selected by their own judges as representing the best work done at their NSF affiliated fairs. Each of these fairs serves large regions — a city, a county, many counties, a state, a chain of islands, or an entire nation. Many of these fairs use a quota system which necessitates prior eliminations in which these finalists cleared all of the hurdles.

This Catalog also provides a conception of the many groups and organizations which play effective roles in the conduct of their science fairs. A more complete record is obtainable from the literature of each affiliated fair, some of which may have as many as 100 co-sponsors, not counting the thousands of educators, scientists, and other personnel involved.

For the first time this year both oceans have been bridged by the NSF. The science fair movement is being studied by many foreign lands. Their assurance of participation in the NSF is very promising.

Also for the first time the Navy, Air Force and Air Force Association, and Army join the American Medical Association to award honors at the national level to students preparing for careers in science.

Science Service, the non-profit institution for the popularizing of science which conducts the National Science Fair, and administers Science Clubs of America comprising more than 19,500 clubs, pays tribute to the finalists listed, and to the thousands of other people and organizations who made possible the presence of the NSF finalists here in Flint.

## National Science Fair Awards

NSF FINALIST AWARD—To each finalist, a rainbow-ribboned, solid silver medal with a solid gold SCA emblem. The reverse of the medal is engraved with name of student and sponsoring organization. A facsimile of this medal appears on each exhibit card.

NSF CERTIFICATE AWARD—To each school, with name of finalist, title of exhibit and facsimile medal.

NSF "WISH AWARDS"—All awards are scientific material, equipment, apparatus, books, etc., freely selected by the finalist for scientific work in the future. Ties may be declared by the NSF judges.

Four First Awards—Valued at \$125 each  
Four Second Awards—Valued at \$75 each  
Four Third Awards—Valued at \$50 each  
Fourth Awards—Valued at \$25 each (Up to 25% of remaining finalists, at discretion of judges.)

## Other NSF Awards

AMA CITATIONS—The American Medical Association will make two Award and two Honorable Mention Citations for the best exhibits in the broad field of medical sciences or health. Award Citations carry with them all-expense-paid trips to the annual meeting of the AMA in San Francisco.

NAVY SCIENCE CRUISERS—The U. S. Navy judges will honor five finalists from fairs in continental U. S., whose exhibits are considered best in the broad area of Navy-oriented projects. In September or October these finalists will join more than 100 other students from regional NSF affiliated fairs for about five days on a highly science-oriented trip on fleet ships at sea. Five first alternates, and five second alternates will be recognized.

AIR FORCE AND AIR FORCE ASSOCIATION AWARDS—Judges will select the most outstanding exhibit in the field of air power, and the most outstanding in the field of air exploration. The two finalists, plus their exhibits will receive certifications and appear with their exhibits at the Airpower Panorama, Dallas, in September, where plaques also will be awarded. Two alternates will be named.

U. S. ARMY SCIENCE AWARDS—Judges will honor three finalists whose exhibits are in the specialized areas of missiles, satellites, electronics, electronic calculators, mathematics, high and low temperatures, instrumentation, meteorology and medicine. Finalists will spend a week at the Jet Propulsion Laboratories, Pasadena; Army Ballistic Missile Agency, Huntsville, or Army Medical Center, Washington, depending on subject and location of finalist. Three alternates will be named.

## Criteria for Judging

Judging for all awards by all judges is based as follows:

I. Creative Ability	30 points	IV. Skill	10 points
II. Scientific Thought	30 points	V. Clarity	10 points
III. Thoroughness	10 points	IV. Dramatic Value	10 points

### ALABAMA

- Third SOUTHEASTERN ALABAMA Regional Science Fair, Auburn Alabama Polytechnic Institute - Montgomery Advertiser-Journal
- 1. Analysis of Metal Ions by Ion Replacement Aldine Stephen Johnson, Jr. (18) - West Point High School, West Point, Ga.
- 2. Classifying Rocks in the Southeast Alabama Coastal Plain \*Janice Maria Thompson (16) - Geneva County High School, Hartford
- Fourth NORTH CENTRAL ALABAMA Regional Science Fair, Birmingham The Alabama Academy of Science - North Central Alabama Science Fair Council
- 3. Conduction of Electricity by Rarefied Gases William Harvey McCulla (16) - Woodlawn High School, Birmingham
- 4. Planaria - Effects of Temperature on Regeneration \*Harriet Ann Nabors (16) - West End High School, Birmingham
- Fourth NORTH ALABAMA Regional Science Fair, Florence Florence State College - North Alabama Daily Newspapers
- 5. Radar and Sonar Clifford R. Vaughan, Jr. (18) - Decatur High School, Decatur
- 6. The Common Cold, Influenza, and Throat Infections \*Lota Millicent White (17) - Athens High School, Athens
- Fourth MOBILE Regional Science Fair, Mobile Alabama Academy of Science - Spring Hill College
- 7. Electrophoresis of the Blood of Animals \*Patricia Ernestine Sherman (17) - Foley High School, Foley
- 8. Development and Uses of the Slide Rule Charles Franklin Yeager (17) - Murphy High School, Mobile

### ALASKA

- Second GREATER ANCHORAGE ALASKA Science Fair, Anchorage Cook Inlet Branch, American Association for the Advancement of Science - Anchorage Daily News
- 9. Computer to Compose Music Robert Edward Arnell (16) - Anchorage High School, Anchorage
- 10. Alaskan Wildlife - Prehistoric and Modern \*Roberta Sue Widdifield (15) - Anchorage High School, Anchorage

### ARIZONA

- Fifth CENTRAL ARIZONA Regional Science Fair, Tempe Arizona Science Academy - Arizona Science Teachers Association - Industrial and Business Firms
- 11. Effect of Cortisone on the Drosophila Paul Franklin Eckstein (17) - West High School, Phoenix
- 12. Effect of a Controlled Electric Current and Colored Light on Algae \*Karen Ann Kjelgaard (18) - West High School, Phoenix
- Fourth SOUTHERN ARIZONA Regional Science Fair, Tucson University of Arizona
- 13. Solving the 60 Degree and 120 Degree Triangles Richard Joseph Jensen (16) - Salpointe High School, Tucson
- 14. Medical History of an Injured Horse \*Ann Garron Lyon (16) - Saint Joseph's Academy, Tucson

### ARKANSAS

- Sixth ARKANSAS STATE Science Fair, Little Rock Arkansas Medical Society - Central Arkansas Chemical Society - Lion Oil Co.
- 15. Effects of Temperature on the Toxicity of Insecticides William Paul Boyer, Jr. (18) - University High School, Fayetteville
- 16. Experiments with Rockets Gerald Wayne Johnson (18) - Crossett High School, Crossett

### CALIFORNIA

- Third CALIFORNIA CENTRAL VALLEYS Science Fair, Chico The Sacramento Bee - KFBK - Chico State College
- 17. Some Effects of Gibberellic Acid on Plants \*Frances Joanne Barkley (15) - Orland Joint Union High School, Orland
- 18. Rockets Michael J. Pianka (16) - Yreka High School, Yreka
- Fifth CALIFORNIA CENTRAL VALLEYS Science Fair, Fresno The Fresno Bee - KMJ - KMJ-TV - Fresno State College
- 19. A Mosquito-Destroying Fish ## Melvin Douglas Ball (17) - Clovis Union High School, Clovis
- 20. Science Fights State's Most Costly Alfalfa Pest - The Spotted Alfalfa Aphid \*Joan Carol Lieberman (15) - East Bakersfield High School, Bakersfield
- Seventh SOUTHERN CALIFORNIA Science Fair, Los Angeles Southern California Science Fair Association
- 21. Study of Periodically Precipitating Reactions Occurring in a Lyophilic Colloidal Dispersion John Thomas Horn (16) - Santa Fe High School, Santa Fe Springs
- 22. Euglena - Animal or Vegetable? \*Eileen Marilyn Jackson (16) - Immaculate Heart High School, Los Angeles
- Fifth CALIFORNIA CENTRAL VALLEYS Science Fair, Modesto The Modesto Bee - KBEE - Modesto Junior College
- 23. The Human Body \*Georgenie Marie Brann (17) - Oakdale Joint Union High School, Oakdale

- 24. Vertebrate Skeleton Bing Leat Mah (19) - Modesto High School, Modesto

- 25. Fifth CALIFORNIA CENTRAL VALLEYS Science Fair, Sacramento The Sacramento Bee - KFBK - Sacramento State College
- 26. Study of the Visible Light Spectrum David D. Miller (16) - La Sierra High School, Carmichael
- 27. Environmental Effects on Plants of the Sutter Buttes \*Karen E. Reynolds (15) - Marysville Union High School, Marysville
- 28. Second INLAND Science Fair, San Bernardino Inland Science Fair Association, Inc.
- 29. X-Rays from a Spark Plug Vernon Allen Evans (17) - Pacific High School, San Bernardino
- 30. Effect of Low Temperatures on Uredospores of Wheat Rust \*Margaret Jane Harvey (17) - San Bernardino High School, San Bernardino
- 31. Fourth GREATER SAN DIEGO Science Fair, San Diego San Diego Union - Industry - Scientific and Technical Organizations
- 32. Magnetic Thermo-Nuclear Chamber Alan E. Hill (18) - Sweetwater High School, National City
- 33. Are Marine Bacteria Harming Kelp? \*Patricia Kirk (16) - Cathedral Girls High School, San Diego
- 34. Fifth SAN FRANCISCO BAY AREA Science Fair, San Francisco San Francisco Bay Area Science Fair Association
- 35. New Procedure for Rare Earth Separation John Oakley Beahrs (17) - Palo Alto Senior High School, Palo Alto
- 36. Algae Growth Larry Karl Dahlkrist (17) - Ellwood Patterson Cubberley High School, Palo Alto

### COLORADO

- 37. Third COLORADO-WYOMING Science Fair, Boulder Joint Science Fair Committee
- 38. Complete Proportional Control System Dean Stewart Ehn (16) - College High School, Greeley
- 39. Life Histories of Mayflies David M. Jessup (17) - Greeley High School, Greeley
- 40. Second PUEBLO COLLEGE Regional Science Fair, Pueblo Pueblo College - Pueblo Chamber of Commerce
- 41. Influence of Nortestosterone, Testosterone, and Growth Hormone upon Blood Formation John D. Friede (17) - Abbey School, Canon City

### CONNECTICUT

- 42. Ninth NORTHERN CONNECTICUT Science Fair, Hartford The Hartford Times
- 43. Experimentation with Ionizing Radiation Robert Goodwin Olmsted (16) - Manchester High School, Manchester
- 44. A New Method of Stereosound Reproduction George Robert Wisner (16) - Bulkeley High School, Hartford

### DELAWARE

- 45. Sixth DELAWARE STATE Science Fair, Wilmington Wilmington News-Journal Newspapers
- 46. Ovarian Transplants John Halton Lecky (15) - Friends School, Wilmington
- 47. Continuous Cloud Chamber Eric Davis Schneider (17) - Mount Pleasant High School, Wilmington

### DISTRICT OF COLUMBIA

- 48. Twelfth WASHINGTON Science Fair, Washington Washington Junior Academy of Sciences - Joint Board on Science Education
- 49. Four-Dimensional Graphing to Find Complex Roots Lawrence Moser Breed (17) - Sidwell Friends School, Washington
- 50. A Study of Melanin Turnover in Tadpoles Robert Walker Lynn (17) - Woodrow Wilson High School, Washington

### FLORIDA

- 51. Fourth SOUTH FLORIDA Science Fair, Hialeah University of Miami - The Miami Herald
- 52. Polarographic Fluid Analyzer Lawrence Marvin Gentleman (17) - Miami Beach Senior High School, Miami Beach
- 53. How the Chicken Develops \*Sue Ellen Hirschfeld (17) - Fort Lauderdale High School, Fort Lauderdale
- 54. Third FLORIDA STATE Science Fair, St. Petersburg Florida Foundation for Future Scientists
- 55. Glands - Study, Research, and Transplantation James E. Kutz III (17) - Archbishop Curley High School, Miami
- 56. Electronic Balance David Stephen Toback (17) - Coral Gables Senior High School, Coral Gables

- Fifth PINELLAS COUNTY Science Fair, St. Petersburg  
St. Petersburg Times - Pinellas County School System
- 46. Modern Miracles of Surgery and How They Benefit You  
\*Joan Elizabeth Koenig (19) - St. Petersburg Senior High School, St. Petersburg

### GEORGIA

- Tenth GEORGIA STATE Science Fair, Athens  
Georgia Junior Academy of Science - University of Georgia - Associated Industries of Georgia
- 47. Experimental Automatic Guidance of Vehicles  
Alan J. Friedman (15) - North Fulton High School, Atlanta
- 48. Some Effects of Molds and Mold By-Products on Beans and Pansies  
John Bryan Kethley (15) - Decatur High School, Decatur
- Fourth ATLANTA Science Congress, Atlanta  
Atlanta Board of Education - Citizens Committee for Science Education
- 49. Radioiodine in Guppies  
#William Albert Dunson (16) - Northside High School, Atlanta
- 50. Experimentation in Aerodynamics  
Leland Brooks Jackson (17) - Southwest High School, Atlanta
- Sixth HIGH SCHOOL STATE Science Fair, Fort Valley  
Fort Valley State College
- 51. Study of the Frog  
\*Mary Louise Scott (16) - Sumter County High School, Americus
- 52. Principles of Rockets and Satellites  
Robert Verone Taylor (17) - Sumter County High School, Americus

### GERMANY

- First USAREUR Science Fair, Heidelberg  
United States Army Dependents' Education Group, Europe - Stars and Stripes, European Edition
- 53. Bacteriology  
Serge Lucas Liros (16) - Munich American High School, Munich
- 54. Effect of Diet on Basal Metabolism and Respiratory Quotient  
\*Sarah Anne Smith (16) - Kaiserslautern American High School, Kaiserslautern

### HAWAII

- First HAWAIIAN Science Fair, Honolulu  
Hawaiian Academy of Science and Associated Societies
- 55. Satellite Electronics  
Steven Perry Gouveia (17) - St. Louis High School, Honolulu
- 56. Culturing Paramecia  
\*Naomi Keonaona Kuniyuki (15) - Kaimuki High School, Honolulu

### IDAHO

- Third NORTHEASTERN IDAHO Science Fair, Rexburg  
Rexburg Journal and Standard - Ricks College - Idaho Falls Post-Register
- 57. Blood Components - Tests and Instruments  
\*Jean Rose Anna McHan (16) - Idaho Falls Senior High School, Idaho Falls
- 58. Positive and Negative Feedback  
Brent Earl Wadsworth (16) - Idaho Falls Senior High School, Idaho Falls

### ILLINOIS

- Second QUINT-CITY Science Fair, Rock Island  
American Society of Mechanical Engineers, Iowa - Illinois Section
- 59. How Do Our Teeth Behave in Chemical Solutions?  
\*Janet Alongi (17) - Alleman High School, Rock Island
- 60. A Solar Motor  
Haven Noble (15) - Davenport High School, Davenport, Iowa

### INDIANA

- Sixth SOUTHEASTERN INDIANA Regional Science Fair, Bloomington  
Owen-Monroe County Medical Society - Indiana University
- 61. The Honey You Eat - A Documentary Film  
Frederick W. Craig, Jr. (15) - Greensburg Community High School, Greensburg
- 62. A Study of Land Use in the Watershed Basin of the Proposed Monroe Reservoir and Recommendations Concerning Reforestation  
Jan Willem van Wagendonk (18) - University School, Bloomington
- Fifth WEST CENTRAL INDIANA Regional Science Fair, Crawfordsville  
Wabash College
- 63. Atom Smasher and Ionic Drive Reaction Motor  
William Harry Hatfield (15) - Bainbridge High School, Bainbridge
- 64. Rhythm in the Id  
Larry W. Shaffer (16) - Wiley High School, Terre Haute
- Ninth TRI-STATE Regional Science Fair, Evansville  
The Evansville Press - Evansville College
- 65. Spectroscopy  
William B. Dress, Jr. (18) - F. J. Reitz High School, Evansville
- 66. Oxidation Answers Food and Energy Needs  
Joseph E. Mader (17) - St. Meinrad Minor Seminary, St. Meinrad

- Third NORTHEASTERN INDIANA Regional Science Fair, Fort Wayne  
Purdue University, Fort Wayne Center - Fort Wayne Greater Business and Industries

- 67. Effects of Light Variation on Plant Growth  
Thomas Michael Church (15) - South Side High School, Fort Wayne
- 68. Titanium - Produced by New Method  
James C. Hartman (17) - Central Catholic High School, Fort Wayne
- First CALUMET Regional Science Fair, Hammond  
Industry and Business - Purdue University
- 69. The Electron Microscope  
David Paul Early (16) - Bishop Noll High School, Hammond
- 70. Thrust Stand and Rocket Fuels  
Robert Bruce Lehman (17) - Thornton Fractional Township High School, South Branch, Lansing, Illinois
- Fifth CENTRAL INDIANA Regional Science Fair, Indianapolis  
Professional Societies - Butler University

- 71. Catoptrics - Real Images in Space  
Robert Craig Calkins (16) - Broad Ripple High School, Indianapolis
- 72. Oxygen for Space - Produced as You Go!  
\*Julia Berg Freeman (17) - Thomas Carr Howe High School, Indianapolis

- Sixth LAFAYETTE Regional Science Fair, Lafayette  
Lafayette Journal and Courier - Purdue University
- 73. Tomato Tissue Culture  
Jon Michael Dunn (16) - Jefferson High School, Lafayette
- 74. Model Earth Satellite  
Donald Gene Larimore (15) - Delphi High School, Delphi
- Sixth EAST CENTRAL INDIANA Regional Science Fair, Muncie  
Eli Lily and Company, Indianapolis - Ball State Teachers College

- 75. Sodium-Water Reaction  
Daniel Wilson Bacon (16) - Burris High School, Muncie
- 76. Insects on Our Farm  
#\*Eileen Jane Settle (17) - Portland-Wayne Township High School, Portland

- Second NORTHERN INDIANA Regional Science Fair, North Manchester  
Manchester College - North Manchester News Journal
- 77. Developing Three-Dimensional Geometric Visualization Through the Medium of Games  
Frederick Olen Roberts (17) - Manchester High School, North Manchester

- 78. Historical Geology  
David Clark Southall (15) - Elkhart High School, Elkhart
- Sixth NORTHWESTERN INDIANA Regional Science Fair, Valparaiso  
Valparaiso University - County Medical Societies
- 79. Radiation Hazard  
Charles Thomas Hess (17) - Isaac C. Elston Senior High School, Michigan City
- 80. Gibberellic Acid  
Norman Edwin Schumaker (17) - Isaac C. Elston Senior High School, Michigan City

### IOWA

- Fifth NORTHEAST IOWA Science Fair, Cedar Falls  
Iowa State Teachers College - Waterloo Courier - Area Industries
- 81. Scarification of Seeds by Electrical, Chemical, and Mechanical Methods  
Anthony J. Dingbaum (17) - Xavier High School, Dyersville
- 82. Action of Enzymes in the Process of Digestion  
\*Janice Flo Herman (17) - George Washington Senior High School, Cedar Rapids

### JAPAN

- First JAPAN STUDENT Science Awards and Science Fair, Tokyo  
The Japan National Council for Advancement of Scientific Education • Yomiuri Shimbun
- 83. Decrease in Weight of Frog During Hibernation  
Ichiyo Matsubara (18) - Hibiya Senior High School, Tokyo
- 84. Study on Salivary Amylase  
\*Kumiko Nagano (18) - Hakuo Senior High School, (Taito-Ku) Tokyo

### KANSAS

- Fifth DOUGLAS COUNTY Science Fair, Lawrence  
Lawrence Recreation Commission - Lawrence Chemical Industries • KLWN Radio
- 85. Expansion Cloud Chamber for Observation of Tracks of Alpha Particles  
Harold Wayland Fearing (16) - Lawrence High School, Lawrence
- 86. Effects of Cold Weather on the Guinea Pig  
##\*Deborah Louise Young (17) - Lawrence High School, Lawrence
- Third MARYMOUNT COLLEGE Science Fair, Salina  
Marymount College - Salina Businessmen and Individuals
- 87. Ions and the Living Force of Plant Tissue  
John David Irvine (16) - Luckey High School, Manhattan
- 88. Phosphorus Uptake by Autoradiography  
\*Joanne Marie Zerger (15) - Salina Senior High School, Salina
- Third TOPEKA Regional Science Fair, Topeka  
Community Sponsors
- 89. Paleontology  
Edward Joseph Dolsky (17) - Hayden High School, Topeka
- 90. Extraction of Metallic Sodium by Ionic Transfer  
Paul Clifford Schaich, Jr. (17) - Highland Park High School, Topeka

- Second WICHITA Regional Science Fair, Wichita  
Medical Society of Sedgwick County - Professional Engineers Society of Wichita

- 91. Effects of Thermal Neutrons on Mammalian Systems  
Jon E. Cornell (17) - Wichita High School North, Wichita

- 92. Astronomical Photoelectric Photometer  
Larry W. Odom (17) - Wichita High School Southeast, Wichita

#### LOUISIANA

- Fourth LOUISIANA STATE Science Fair, Alexandria  
Louisiana Academy of Sciences

- 93. Plant Parasitic Nematodes  
\*Helen Winn Houston (17) - Baton Rouge Senior High School, Baton Rouge

- 94. Heliostat  
Emelle Lee Smothers (18) - Fortier High School, New Orleans

- Fourth NORTHEAST LOUISIANA Regional Science Fair, Monroe  
Northeast Louisiana State College

- 95. Weight of an Atom  
Phillip M. Kerry (17) - West Monroe High School, West Monroe

- Fourth LOUISIANA TECH Regional Science Fair, Ruston  
Louisiana Polytechnic Institute

- 96. Living Sulfates and Elementary Crystallography  
\*Betty Ann Moore (17) - Chatham High School, Chatham

- 97. Spectroanalysis of Chemicals  
Scott Monroe Weathersby, Jr. (17) - Ruston High School, Ruston

#### MARYLAND

- Third BALTIMORE Science Fair, Baltimore  
Kiwanis Club of North Baltimore - Johns Hopkins University

- 98. Experimental Crosses in Drosophila  
Richard Vann Frazier, Jr. (15) - Kenwood High School, Baltimore

- 99. Thinking Machine  
Roger Roberts (16) - Baltimore Polytechnic Institute, Baltimore

- Tenth PRINCE GEORGES AREA Science Fair, College Park  
Prince Georges Science Fair Association - Board of Education of Prince Georges County

- 100. Reactions of Certain Aquatic Plants to Environmental Changes  
Richard Edwin Griffith, Jr. (18) - Northwestern Senior High School, Hyattsville

- 101. Study of Water Wave Motions  
George V. Waldo, Jr. (17) - Bladensburg Senior High School, Sunnybrook

- Third MONTGOMERY COUNTY Science Fair, Silver Spring  
Montgomery County Board of Education

- 102. Electronic Logic Analyzer for Solving Complex Problems in Propositional Calculus  
Edward Ganz (16) - Walter Johnson High School, Rockville

- 103. Experimental Studies of an Antidiabetic Agent  
Robert Verlin Stephens (18) - Bethesda-Chevy Chase High School, Bethesda

#### MASSACHUSETTS

- TECHNORAMA II, Lowell  
The Lowell Sun - Lowell Technological Institute

- 104. Effects of Gibberellic Acid  
\*Anna Marie Kane (16) - Academy of Notre Dame, Tyngsboro

- 105. Automatic Digital Computer  
Peter Richard Samson (16) - Lowell High School, Lowell

- Second GREATER NEW BEDFORD Science Fair, New Bedford  
New Bedford Citizens Council for Public Schools

- 106. Prime Numbers  
\*Ann Elizabeth Pflug (17) - New Bedford High School, New Bedford

- Third WORCESTER COUNTY Regional Science Fair, Worcester  
The Worcester and Greendale Kiwanis Clubs of Worcester, Massachusetts

- 107. Microbiological Studies on the Metabolic Mechanism of 4-Aminomethylpteroylglutamic Acid; and Nucleic Acid Metabolism  
Thomas J. Kelly, Jr. (16) - Weston High School, Weston

- 108. New Type Dial Telephone System  
Edward F. Perry, Jr. (17) - Natick High School, Natick

#### MICHIGAN

- First METROPOLITAN DETROIT Science Fair, Detroit  
The Detroit News - The Engineering Society of Detroit

- 109. Separation of the Plasma Proteins by Paper Chromatography and Paper Electrophoresis  
Robert Joseph Seguin (18) - Catholic Central High School, Detroit

- 110. Effects of Plant Hormones  
Richard Serwin (16) - Pontiac Central High School, Pontiac

- Second FLINT Science Fair, Flint  
The Flint Journal - Flint Junior College - General Motors Institute - Mott Foundation - Flint Public Schools

- 111. Textiles  
\*Jo Ella Heintz (16) - Dye High School, Flint

- 112. Fusion - The Power of the Future  
Don Paul Moehrke (17) - Flint Central High School, Flint

- First GRAND RAPIDS HERALD Science Fair, Grand Rapids  
The Grand Rapids Herald

- 113. Anatomy of the White Rat  
\*Carol Lynne Rens (17) - Ottawa Hills High School, Grand Rapids

- 114. Principle of Induction  
Volker Otto Thiry (17) - Catholic Central High School, Grand Rapids

- Eleventh CENTRAL MICHIGAN Youth Talent Exhibit and Science Fair, Lansing  
The State Journal - Lansing Recreation Department

- 115. Nuclear Magnetic Resonance Spectrometer  
Verne De Hulce (16) - Lansing Eastern High School, Lansing

- 116. Astronomical Reflecting Telescope  
Richard Dale Yarger (17) - Everett High School, Lansing

- Fourth NORTHERN MICHIGAN Science Fair, Marquette  
Northern Michigan College - The Mining Journal

- 117. Polymeric Experimentation to Determine the Specific Characteristics of Macromolecular Substances  
#William Edward Hauda (17) - Sault Ste. Marie High School, Sault Ste. Marie

- 118. Heat in Motion  
\*Sybil Eileen Trepanier (17) - Iron Mountain High School, Iron Mountain

- First TRI-COUNTY Science Fair, Midland  
Tri-County Science Fair Association

- 119. Making Plastics from Gelatin  
William H. Brenner (16) - St. James High School, Bay City

- 120. Effects of an Ataraxic Agent on Rats  
# # \*Sarah Elizabeth Southwick (17) - Midland Senior High School, Midland

- First SOUTHWESTERN MICHIGAN Science Fair, St. Joseph  
Michigan State University - Twin City Chamber of Commerce

- 121. Insect Control in Berrien County, Michigan  
\*Barbara Ellen Brown (16) - Benton Harbor High School, Benton Harbor

- 122. Nuclear Powered Electric Generator  
Rodney S. Krieger, Jr. (17) - Coloma High School, Coloma

- Third THUMB Fair of Science, Arts, and Letters, Sebewaing Huron and Tuscola Counties - Sebewaing High School Science Club - Industry

- 123. The Generation of X-Rays  
Robert L. Czewski (18) - Ubly High School, Ubly

- 124. Uses of Solar Energy  
Everett A. Wingert (15) - Kingston Community School, Kingston

#### MINNESOTA

- Twenty-first JUNIOR ACADEMY OF SCIENCE Fair, Bemidji  
Minnesota Academy of Science - Bemidji Pioneer

- 125. Humeral Transplants  
David R. Brown (15) - St. Louis Park Senior High School, St. Louis Park

- 126. Missile and Guidance System  
Marshall Sidney Kriesel (17) - Owatonna High School, Owatonna

- Fifth SOUTHEASTERN MINNESOTA Regional Science Fair, Rochester Rochester Junior College - Mayo Chapter Sigma XI - Southeastern Minnesota Science and Mathematics Association - Winona State College

- 127. Effect of Ultraviolet Radiations on the Growth and Pigmentation of Monascus purpureus  
#\*Jane Marie Earl (17) - Austin High School, Austin

- 128. Meteorology in Southeastern Minnesota  
Paul A. Oxley (17) - Austin High School, Austin

#### MISSISSIPPI

- Fourth DELTA DISTRICT III Science Fair, Cleveland  
Delta Council Education Committee - Delta State College

- 129. New Hope for Cotton Bollworm Control  
Dennis Ford Bouchard (17) - Greenwood High School, Greenwood

- 130. The Brain, Spinal Cord, and Nervous System  
\*Ward Whittington (15) - Greenwood High School, Greenwood

- Fifth MISSISSIPPI STATE Science Fair, Jackson  
Mississippi Academy of Science

- 131. Plants - Anatomy, Morphology, and Classification  
\*Jane Cleveland Montgomery (17) - Greenwood High School, Greenwood

- 132. Equatorial Newtonian Telescope  
Keith Robert Spence (15) - Biloxi High School, Biloxi

#### MISSOURI

- Second SOUTHEAST MISSOURI Regional Science Fair, Cape Girardeau Southeast Missouri State College - Cape Girardeau Southeast Missourian

- 133. Weather Simulator  
Robert Wayne Goin (16) - Chaffee High School, Chaffee

- 134. Rain Alarm  
Danold Wayne Golightly (17) - Central High School, Cape Girardeau

- Seventh GREATER KANSAS CITY Science Fair, Kansas City  
Science Pioneers, Inc.

- 135. Determination of the Charge of an Electron Using the Millikan-Strókes Effect  
\*JoAnne Joyce Holbert (15) - Sumner High School, Kansas City, Kansas

- 136. Protein-Antibody Relationship During Streptococcal Infection  
George Leonard Marchin, Jr. (17) - Ward High School, Kansas City, Kansas

- Eleventh GREATER ST. LOUIS Science Fair, St. Louis  
St. Louis Post-Dispatch
- 137. Michelson Interferometer  
Antony P. J. Browne (17) - Southwest High School, St. Louis
- 138. Ethnobotany of Corn  
Michael James Wynne (18) - St. Louis University High School, St. Louis
- MONTANA**
- Second MIDLAND EMPIRE Science Fair, Billings  
Eastern Montana College
- 139. Groups - Mathematics  
Lindsay LaRoy Hess (18) - Bozeman Senior High School, Bozeman
- Third BUTTE Regional Science Fair, Butte  
Butte Regional Science Fair Association
- 140. Radio Astronomy  
William H. Bayliff (17) - Butte High School, Butte
- 141. Mosaics by Reflection  
\*Welda Mainard (16) - Butte High School, Butte
- Third MONTANA Science Fair, Missoula  
Montana State University
- 142. Inducing Polyploidy in Wild Strawberries, *Fragaria ovalis*  
Roger William Andersen (17) - Great Falls High School, Great Falls
- 143. Hypersensitivity  
\*Clare L. Chatland (16) - Missoula County High School, Missoula
- NEW HAMPSHIRE**
- Sixth NORTH COUNTRY Science Fair, Lancaster  
Coos County Democrat - Lancaster High School
- 144. Axenic Cultures in Medical Research  
#Leo G. Morin (17) - Notre Dame High School, Berlin
- 145. Spectroscopy  
#Maurice E. Renaud (17) - Notre Dame High School, Berlin
- NEW JERSEY**
- Fifth GREATER NEWARK Science Fair, Newark  
Newark College of Engineering
- 146. Applications of Short Ultraviolet Radiation  
David Victor Hunt (15) - Irvington High School, Irvington
- 147. Dutch Elm Disease Research  
Eric Lawrence Rickes (17) - Rahway High School, Rahway
- Fifth CENTRAL NEW JERSEY Science Fair, New Brunswick  
Rutgers University - New Jersey Science Teachers Association
- 148. Amphibia - The Frog  
Jack Chang (16) - South Plainfield High School, South Plainfield
- 149. Homologous Structures  
\*Barbara Bernice Ferrand (17) - Watchung Hills Regional High School, Plainfield
- Second NORTH JERSEY Science and Mathematics Fair, Teaneck  
Science-Mathematics Society of North Jersey - Fairleigh Dickinson University
- 150. Cancer Induced by the Rous Sarcoma Virus  
\*Diane Jean Davis (17) - Hanover Park Regional High School, Hanover
- 151. Heredity in Paramecia  
Mark William Dubin (15) - Bergenfield Senior High School, Bergenfield
- Sixth GREATER TRENTON Science Fair, Trenton  
Trenton Evening Times - Engineers Club of Trenton
- 152. Ecological Study of the New Jersey Pine Barrens  
\*Peggy Ann Nicklin (18) - Trenton Central High School, Trenton
- NEW MEXICO**
- Sixth NEW MEXICO Science Fair, Socorro  
New Mexico Institute of Mining and Technology - Albuquerque Journal
- 153. Reproduction and Concentration of Mutations in Guppies  
\*Carol Ann McColm (18) - Farmington High School, Farmington
- 154. Minerals - Servants of Mankind  
Danny Ray Thompson (17) - Artesia High School, Artesia
- NEW YORK**
- The Twentieth School Science Fair, BOROUGH OF BRONX CENTER, New York  
The American Institute of the City of New York
- 155. Instrumentation of Space Satellites  
Ronald Michael Benrey (16) - Bronx High School of Science, New York
- 156. Collecting and Culturing Invertebrates  
Raymond Feerick (16) - DeWitt Clinton High School, New York
- The Twentieth School Science Fair, BOROUGH OF BROOKLYN CENTER, New York  
The American Institute of the City of New York
- 157. Electronic Typing Device  
Paul Blutter (16) - Brooklyn Technical High School, Brooklyn
- 158. High Voltage Particle Acceleration  
Mel Steinberg (16) - Lafayette High School, Brooklyn
- The Twentieth School Science Fair, BOROUGH OF MANHATTAN CENTER, New York  
The American Institute of the City of New York
- 159. Controlled Scattering of Light  
Arthur Nathan Fankuchen (14) - Stuyvesant High School, New York
- 160. Logical Analysis Device  
Barry Schindler (15) - Stuyvesant High School, New York
- The Twentieth School Science Fair, BOROUGH OF QUEENS CENTER, New York  
The American Institute of the City of New York
- 161. Binary Arithmetic Computer  
Leo P. Mariani, Jr. (17) - Bayside High School, Bayside
- 162. The Guided Missile  
Barry S. Markson (17) - Jamaica High School, Jamaica
- The Twentieth School Science Fair, BOROUGH OF RICHMOND CENTER, New York  
The American Institute of the City of New York
- 163. Velocity of Light; Michelson's Experiment  
\*Shelby Louise Berger (17) - Tottenville High School, Staten Island
- 164. Uses of Radioisotopes  
Jonathan Levy (14) - Curtis High School, Staten Island
- Eighth PLATTSBURGH Regional Science Fair, Plattsburgh  
State University Teachers College, Plattsburgh, N.Y.
- 165. Gas Discharge and Seed Germination  
Peter Maurice A. Neveu (16) - Chateaugay Central School, Chateaugay
- 166. Speed of Ion Migration  
\*Marilyn Ann Reed (17) - Chateaugay Central School, Chateaugay
- Third WESTCHESTER Science Fair, White Plains  
Westchester County Publishers, Inc. - New York University
- 167. Precision Electronic Analog Computer  
Kenneth Merrill Hanson (18) - Rye Neck High School, Mamaroneck
- 168. Penicillin-Resistant Bacteria  
\*Barbara Jeanne Reynolds (15) - Charles E. Gorton Junior-Senior High School, Yonkers
- NORTH CAROLINA**
- Fourth NORTH CAROLINA STATE Science Fair, Durham  
North Carolina Academy of Science
- 169. Lichens - Their Analysis, Structure, and Uses  
\*Nancy Rebecca Green (17) - Enka High School, Enka
- 170. Paper Electrophoresis  
Frank Conder Ziglar (16) - Needham B. Broughton Senior High School, Raleigh
- NORTH DAKOTA**
- Fifth NORTH CENTRAL NORTH DAKOTA District Science Fair, Devils Lake  
Elks Lodge No. 1216 - BPOE
- 171. Fuel, Tracking, and Instrumentation for Amateur Rockets  
David Allen Thompson (17) - Central High School, Devils Lake
- 172. Crystal Structure  
# # # \*Eleanor Rachel Weisenhaus (18) - Central High School, Devils Lake
- Sixth GRAFTON Regional Science Fair, Grafton  
Grafton National Bank - Walsh County State Bank
- 173. Electromotive Series and Electroplating  
Gary Fischer (17) - Grafton Central High School, Grafton
- 174. Understanding Magnetism  
Richard R. Votava (15) - Grafton Central High School, Grafton
- Second SOUTH CENTRAL NORTH DAKOTA District Science Fair, Jamestown  
South Central District Science Fair Association
- 175. The Human Body  
#Willis C. Blumhardt (19) - Kulm High School, Kulm
- 176. Amateur Seismology  
Aldean Allen Wahl (15) - Jamestown Senior High School, Jamestown
- Third MANDAN-BISMARCK District Science Fair, Mandan  
City Organization
- 177. 10 Miles Up  
#William Eugene Kirchmeier, Jr. (17) - St. Mary's Central High School, Bismarck
- 178. Lightweight Concrete  
Gunnar F. Unger, Jr. (18) - Mandan Senior High School, Mandan
- Fourth MINOT District Science Fair, Minot  
Kiwanis Club of Minot, North Dakota
- 179. Effects of Gibberellic Acid on Seeds  
Allen James Aplass (17) - Minot Senior High School, Minot
- 180. Analysis of Sagebrush  
\*Nancy Ruth Barnard (17) - Williston High School, Williston
- Fifth VALLEY CITY District Science Fair, Valley City  
Valley City Sponsors
- 181. Synthetic Detergents  
\*Johanna Limvere (16) - Valley City High School, Valley City
- 182. Vacuum Tube Fundamentals  
#Robert Miller (17) - Lincoln High School, Casselton

### OHIO

- Eighth QUADRI-COUNTY Science Fair, Archbold  
Archbold Buckeye
- 183. Variations of the Soil in Fulton County, Ohio  
\*Bernadine Mae Beck (18) - Archbold-German Township Local High School, Archbold
- 184. A Topological Study of Parabolic Curves  
Kriss Leroy Stutzman (17) - Archbold-German Township Local High School, Archbold
- Fifth NORTHEASTERN OHIO Science Fair, Cleveland  
The Cleveland Press - Regional Council of Science Teachers - Academy of Medicine
- 185. Growing Chlorella as a Food Source  
Albert John Camma (17) - Cathedral Latin High School, Cleveland
- 186. Breakdown and Failure of Rocket Materials  
Alden H. A. Fairburn (17) - Lorain High School, Lorain

### OKLAHOMA

- Fourth BARTLESVILLE District Science Fair, Bartlesville  
Technical Career Advisory Committee
- 187. A Kernel of Wheat  
\*Florence Dickerson (16) - Claremore High School, Claremore
- 188. A New Look at the Pyridine Ring  
#Charles A. Frenzel (17) - College High School, Bartlesville
- Third CENTRAL OKLAHOMA Regional Science Fair, Edmond  
Central State College
- 189. Ornithology and Its Techniques  
Robert Eugene Frank (18) - Norman High School, Norman
- 190. Corrosion of Mild Steel in Various Environments  
Luedric D. Harman (17) - Ponca City Senior High School, Ponca City
- Tenth STATEWIDE Science Fair, Norman  
Oklahoma Science Service - University of Oklahoma
- 191. Radio Telescope  
\*Anne Garland Lynch (16) - Northwest Classen High School, Oklahoma City
- 192. Radioactive Adsorption by Plants  
Jerry Dale Röller (19) - Memorial High School, Enid
- Ninth OKLAHOMA CITY Science Fair, Oklahoma City  
Oklahoma Publishing Company - Oklahoma City Chamber of Commerce - Oklahoma City Times
- 193. Linear Accelerator  
Gene Cunningham, Jr. (16) - Harding High School, Oklahoma City
- 194. Blood  
Jimmy Rodger Haws (16) - Classen High School, Oklahoma City
- First TULSA CITY-COUNTY Science Fair, Tulsa  
The Tulsa Tribune - Chamber of Commerce Petroleum Information Committee
- 195. Television: An X-Ray Hazard?  
Dan Dickey (17) - Thomas Edison High School, Tulsa
- 196. Spectrographic Analysis  
Lester James Walters, Jr. (17) - Will Rogers High School, Tulsa

### PENNSYLVANIA

- Twelfth LEHIGH VALLEY Science Fair, Allentown  
Science Teachers - Call-Chronicle Newspapers - Engineers Club
- 197. Bacterial Species Transformation  
\*Lorraine C. Buzas (18) - Nazareth Area Senior High School, Easton
- 198. Original Sport Plane  
John David Keich (18) - Tamaqua Senior High School, Tamaqua
- First CAPITAL AREA Science Fair, Harrisburg  
The Patriot-News Company
- 199. Six-Inch Telescope and Sidereal Clock Drive  
David H. Hibner (17) - William Penn Senior High School, York
- 200. Lebanon Bologna - Its Chemistry  
\*Sandra Lee Suter (17) - Lebanon Senior High School, Lebanon
- Third SUSQUEHANNA VALLEY Science Fair, Lewisburg  
West Branch Manufacturers' Association - Bucknell University
- 201. Gibberellic Acid, Newest Plant Hormone  
\*Ranee Virginia Gordon (15) - Selinsgrove Area Joint High School, Selinsgrove
- 202. Lunar Colony, Springboard to the Stars  
#Llewain Scott Van Doren (16) - Sunbury Area Senior High School, Sunbury
- Tenth DELAWARE VALLEY Science Fair, Philadelphia  
The Philadelphia Inquirer - The Franklin Institute
- 203. Bioassay of an Anesthetic  
\*Ethel Mae Birch (16) - Upper Moreland High School, Willow Grove
- 204. Critical Study of Hydrogen Quantum Mechanics Through Cybernetics  
#Brian Russel De Palma (17) - Friends' Central School, Philadelphia
- Sixth READING-BERKS Science Fair, Reading  
Reading Chemists Club - Science Teachers of Reading and Berks County
- 205. Wind Tunnel  
Kerry Lee Weinhold (15) - Reading Senior High School, Reading

### RODE ISLAND

- Thirteenth RHODE ISLAND SCHOOLS' Science Fair, Providence  
Providence Journal-Bulletin
- 206. Polymorphic Transition  
Henry Felix Breit (16) - Warwick Veterans Memorial High School, Warwick

- 207. Carcinogenesis in Chick Cells  
\*Patricia Lois Skene (16) - Warwick Veterans Memorial High School, Warwick

### SOUTH CAROLINA

- Second CENTRAL SAVANNAH RIVER AREA Science Fair, Augusta, Georgia  
(Region VI of South Carolina and adjacent Georgia)  
Joint Council of Engineering and Scientific Societies, Augusta, Georgia
- 208. Effect of Tranquillizers on Metabolism of White Mice  
Asa William Bennett (16) - Washington-Wilkes High School, Washington, Ga.
- 209. Intestinal Parasites - Hookworm and Tapeworm  
\*Anne Branch Phillips (16) - Langford Junior High School, Augusta, Ga.
- Third EASTERN SOUTH CAROLINA Science Fair, Charleston  
The Charleston Evening Post - The News and Courier
- 210. Antibiotics  
Robert Michael Ginsberg (15) - Rivers High School, Charleston
- 211. Light Beam Transmitting  
Arthur Ronald McPherson (17) - Chicora High School, Charleston Heights
- Third CENTRAL SOUTH CAROLINA Science Fair, Columbia  
South Carolina Academy of Science - Columbia College
- 212. Van de Graaff Generator Designed for an Accelerating Tube  
David W. Bloom (17) - Columbia High School, Columbia
- Second SAND HILLS SOUTH CAROLINA Science Fair, Region IV, Florence  
Florence Morning News - Coker College - County Boards of Education of Florence, Chesterfield, Darlington, Horry, and Lee
- 213. Solar or Battery Powered Transistor Radio  
Woody Maxie McKay (17) - Timmonsville High School, Timmonsville
- Fourth WESTERN SOUTH CAROLINA Science Fair, Greenville  
Furman University - Greenville News-Piedmont - Greenville Exchange Club
- 214. Newton's Third Law of Motion in Action  
Stephen M. Brown (16) - Greenville Senior High School, Greenville
- 215. Instinct vs. Intelligence in Heredity  
#Maxine Violet Burris (17) - Greenville Senior High School, Greenville
- Second PALMETTO STATE Science Fair, Orangeburg  
Palmetto Education Association, Inc.
- 216. Shells of the World  
\*Leola Louise Kersey (15) - Wilkinson High School, Orangeburg
- 217. Applications of Cathode Rays  
Ralph Lindsay (16) - Booker T. Washington High School, Columbia
- Second PIEDMONT SOUTH CAROLINA Science Fair, Spartanburg  
Wofford College - Spartanburg Herald-Journal
- 218. Space Satellite  
Robert Lawson Brawley (18) - Rock Hill High School, Rock Hill
- 219. Dorsal View - Human  
\*Jean Arthur White (16) - Rock Hill High School, Rock Hill

### SOUTH DAKOTA

- Fourth NORTHEAST SOUTH DAKOTA, SOUTHWEST MINNESOTA Science Fair, Brookings  
South Dakota State College
- 220. Effect of Diet on White Rats  
\*Virginia F. Lievan (17) - Brookings High School, Brookings
- 221. Patterns Formed in Lycopodium Powder by an Electric Discharge Across an Air Gap  
Chelcie Bosland Liu (17) - Brookings High School, Brookings
- Third WESTERN SOUTH DAKOTA Science Fair, Rapid City  
South Dakota School of Mines and Technology
- 222. Effects of Selenium Feeding on Albino Rats  
#John William Betts (16) - Spearfish Junior-Senior High School, Spearfish
- Fourth STATE UNIVERSITY OF SOUTH DAKOTA Science Day and Fair, Vermillion  
State University of South Dakota - KVT - Channel 9 - WNAX - 570
- 223. Upper Air Research  
Peter J. Breukelman (18) - Corsica High School, Corsica
- 224. Experiments with a Cold Chamber  
\*Catherine Anne Vogt (17) - St. Mary Academy, Dell Rapids

### TENNESSEE

- Sixth CHATTANOOGA Regional Science Fair, Chattanooga  
The Chattanooga Times - University of Chattanooga
- 225. Experimental Teratology  
#Barbara Ann Conway (16) - Notre Dame High School, Chattanooga
- 226. Electronically Operated Working Model of the Human Heart  
James Lorenza Lindsey (17) - Chattanooga High School, Chattanooga
- Fourth CUMBERLAND PLATEAU Regional Science Fair, Cookeville  
Tennessee Polytechnic Institute
- 227. Light Overtones  
David Willis Chadwell (17) - Homestead High School, Crossville
- 228. Ionization and Conductivity of Solutions  
\*Sandra Lee Peavyhouse (17) - Homestead High School, Crossville
- Sixth SOUTHERN APPALACHIAN Science Fair, Knoxville  
The Knoxville News-Sentinel - University of Tennessee
- 229. Demonstration of Rutherford's Method of Separating Alpha, Beta, and Gamma Radiation  
Lewis Jackson Bledsoe, Jr. (16) - Young High School, Knoxville
- 230. Pituitary Diabetes  
\*Elizabeth Anne Kirkpatrick (16) - Central High School, Fountain City

- Fourth MEMPHIS-SHELBY COUNTY Science Fair, Memphis  
Memphis Civitan Club - Memphis Press-Scimitar
- 231. The U. S. Army Explorer I  
Kenneth Paul Hanover (16) - Christian Brothers High School, Memphis
- 232. Radiation - Effects and Possible Protection  
\*Linda Ann Lawrence (17) - Mabel C. Williams High School, Germantown
- Sixth MIDDLE TENNESSEE Science Fair, Nashville  
Nashville Banner - Vanderbilt University
- 233. Testing Rocket Fuel in Homemade Test Equipment  
Joe Ed Gaddes (16) - David Lipscomb High School, Nashville
- 234. The Geology of Tennessee with Emphasis on Middle Tennessee  
#Sam Bayless Upchurch (16) - Peabody College for Teachers Demonstration School, Nashville

#### TEXAS

- Third OILBELT Science Fair, Texas District VII, Abilene  
Abilene Public Schools - Abilene Reporter-News
- 235. Experiment and Design of Solid Propellant Rockets with the Aid of a Home-Built Static Tester  
Joie Pierce Jones (17) - Abilene High School, Abilene
- 236. Gibberellic Acid - Action on Plant Tissues  
Herman Morris Weller (17) - Abilene High School, Abilene
- Second TEXAS PANHANDLE Science Fair, District IX, Amarillo  
Texas Panhandle Science Fair Council
- 237. Gas Chromatographic Analysis  
##Doyle Jay Kelley (17) - Canyon High School, Canyon
- 238. Animated Solar System  
William Charles Robbins (17) - Canadian High School, Canadian
- Third AUSTIN Science Fair, Texas District X - Southern Division, Austin  
Austin Public Schools - The Travis County Medical Auxiliary Society
- 239. Creatine Metabolism in Nutritional Muscular Dystrophy  
James Henry Eley, Jr. (17) - Stephen F. Austin High School, Austin
- 240. Isolation of a New Growth Stimulant  
Barrie Logan (18) - Stephen F. Austin High School, Austin
- Third DISTRICT XI TEXAS Science Fair, Brownwood  
Howard Payne College - Kiwanis Club of Brownwood
- 241. Wilson Cloud Chamber  
Donald Lee Bradford (17) - Menard High School, Menard
- 242. Human Body - The Most Marvelous Machine  
\*Mary Alice Terry (16) - Coleman High School, Coleman
- Third DISTRICT VIII TEXAS Science Fair, Commerce  
East Texas State Teachers College - Junior Chamber of Commerce
- 243. Electronic Combination Lock  
James Dennis Smith (17) - John Tyler High School, Tyler
- 244. Circulatory System of the Human Body  
John Falkner Young (18) - John Tyler High School, Tyler
- Third SOUTH TEXAS Science Fair, Corpus Christi  
Corpus Christi Caller-Times - Corpus Christi Science Teachers Organization
- 245. Effects of Rattlesnake Venom and Egg White Injections on Small Animals  
Milton Lee Herkimer (17) - Harlingen High School, Harlingen
- 246. Spatial Projection of Abstract Mathematical Systems  
Jon F. Olsen (17) - A. C. Jones High School, Beeville
- Third DISTRICT V TEXAS Science Fair - Eastern Division, Dallas  
Southern Methodist University
- 247. Self-Guided Parabolic Mirror Solar Furnace  
Charles E. Barton (18) - Denton High School, Denton
- 248. Study of a Flea Epidemic in Dallas  
William David Edmonds (16) - Sunset High School, Dallas
- Third TRANS-PECOS Regional Science Fair, Texas District VI, El Paso  
Texas Western College - Group of Business Firms
- 249. Plant Tropisms  
\*Virginia Lee Ripley (15) - Stephen F. Austin High School, El Paso
- 250. Radioisotopes  
#Gordon Wilson Romney (16) - Stephen F. Austin High School, El Paso
- Sixth FORT WORTH Regional Science Fair, Texas District V - Western Division, Fort Worth  
Fort Worth Business, Professional and Civic Organizations
- 251. Parthenogenesis of Rana pipiens Ova  
William Thomas Hawkins (16) - Arlington Heights High School, Fort Worth
- 252. Electrophoresis  
\*Emily Hodges (15) - Polytechnic High School, Fort Worth
- Third TEXAS DISTRICT I Science Fair, Houston  
University of Houston
- 253. Cooling Homes with Solar Heat  
Paul Cornell (16) - Robert E. Lee High School, Baytown
- 254. Sodium Azide - A Possible Aid in Combating Cancer  
##Joe York Thomas (17) - La Porte High School, La Porte
- Second SOUTH PLAINS Regional Science Fair, Texas District IV, Lubbock  
South Plains Science Teachers Association - Texas Technological College - Industry - Hospitals
- 255. Perfect Timing  
William E. Marquam (16) - Monterey High School, Lubbock
- 256. Evidence of Indian Activity in a South Plains Area as Shown by Indian Artifacts  
Andrew M. Taylor (19) - Seagraves High School, Seagraves
- Second ALAMO District Science Fair, Texas District II, San Antonio  
San Antonio Evening News - Professional and Civic Organizations
- 257. Electrical Computer  
James Lynn Karney (16) - Luther Burbank High School, San Antonio

- 258. Toxicity of Plants  
\*Norma Lee Wallace (18) - Alamo Heights High School, San Antonio
- Second BAYLOR Regional Science Fair, Texas District X - Northern Division, Waco  
Baylor Sigma Xi Club - American Medical Association, McLennan Chapter and Auxiliary - Waco Junior League - Waco Times-Herald
- 259. Liquid Lens Photography  
\*Elizabeth Ann Janeway (18) - University High School, Waco
- 260. Lenz's Law Applied to Auto Springs  
Julian Jay Sewell (18) - Belton High School, Belton

#### VIRGINIA

- Third NORTHERN VIRGINIA Science Fair, Arlington  
Alexandria, Arlington, Fairfax Real Estate Board - Joint Board of Science Education - Washington Junior Academy of Sciences
- 261. Theory of the Anti-Universe  
Joel H. Dressler (15) - Wakefield High School, Arlington
- 262. Solar Converter  
Benton A. Durley III (17) - Falls Church High School, Falls Church
- Eighth SOUTHSIDE VIRGINIA Area Science Fair, Charlotte Courthouse Martinsville Bulletin
- 263. Conductivity and Resistance of Certain Melted Salts  
John Lewis Jones (18) - Martinsville High School, Martinsville
- 264. Experiments in Cryogenics - Possible Materials for Use in Low Temperatures of Outer Space  
\*Mary Lou Lacy (15) - Martinsville High School, Martinsville
- Seventh TIDEWATER Science Congress, Portsmouth  
Tidewater Members of Virginia Manufacturers Association
- 265. Petrification of Wood  
\*Roylyn Ruth Tanner (15) - Hampton High School, Hampton
- 266. Telemetering and Tracking System for Rockets Utilizing a Tubeless Automatic Radar Tracking System Computer  
Paul Edward Webb, Jr. (16) - Hampton High School, Hampton
- Fifth WESTERN VIRGINIA Science Fair, Salem  
The Roanoke Times and The Roanoke World-News - General Electric Company
- 267. Factors Affecting Regeneration of the Earthworm  
##Mary Marshall Doyle (17) - William Fleming High School, Roanoke
- 268. Electric Computer  
Arthur Hurn Huffman (17) - Blacksburg High School, Blacksburg

#### WASHINGTON

- Fifth INLAND EMPIRE Science Fair, Spokane  
The Inland Empire Science Fair Association
- 269. The Six Crystal Systems  
\*Martha Jeanell Halverson (16) - Central Valley High School, Veradale
- 270. Basic Principles of a Digital Computer  
Larry Ray Kissler (17) - Wapato Senior High School, Wapato
- Fifth PUGET SOUND Science Fair, Tacoma  
Puget Sound Science Fair, Inc. - College of Puget Sound
- 271. Light - Waves or Matter  
John Arthur Brown (18) - North Thurston High School, Lacey
- 272. Vertebrate Embryology  
\*Margarette Kathleen Fedora (18) - St. Mary's Academy, Winlock

#### WEST VIRGINIA

- Third WEST VIRGINIA Science Fair - Region III, Bluefield  
Pocahontas Industrial Council for Education - Bluefield State College
- 273. Aerodynamic Smoke Tunnel  
Donald Keith McKenzie (16) - Bluefield High School, Bluefield
- 274. Essentials of Plant Growth  
##Scarlett O'Hara McKinney (17) - Sophia High School, Sophia
- Fourth MARSHALL COLLEGE Regional Science Fair, Huntington  
Marshall College
- 275. Process of Making Paper  
\*Judith Ann Houlihan (17) - Saint Joseph High School, Huntington
- 276. Neurohumeral Theory and Cardiac Inhibition  
Robert LeRoy Sayre (17) - Vinson High School, Huntington
- Fourth KANAWHA VALLEY Regional Science Fair, Institute  
Morris Harvey College - West Virginia State College - West Virginia Institute of Technology
- 277. Electronic Analog Computer  
Joseph Andrew McCormick III (15) - Stonewall Jackson High School, Charleston
- 278. Demonstration of Electroluminescent Lighting  
\*Mardi Wolford (16) - Stonewall Jackson High School, Charleston
- Fourth SALEM COLLEGE Regional Fair, Salem  
Salem College
- 279. Color Organ  
Willis Guy Tetrick III (17) - Bridgeport High School, Bridgeport
- Fourth SOUTHEASTERN WISCONSIN Science Fair, Milwaukee  
The Milwaukee Journal - Marquette University
- 280. Psychological Breeding of Pigeons  
Anthony Thomas Drew (18) - Notre Dame High School, Milwaukee
- 281. Spoiled Butters  
\*Nancy Ann Michniewicz (16) - Notre Dame High School, Milwaukee

\*Indicates girl

#Finalist in 1957    ##Finalist in 1956    # ##Finalist in 1957 and 1956

## Newspapers and Other Sponsors Promoting AFFILIATED SCIENCE FAIRS . . .

The Montgomery Advertiser, Ala.  
 University of Alabama, Birmingham, Ala.  
 North Alabama Daily Newspapers.  
 The Mobile Press-Register, Ala.  
 Anchorage Daily News, Alaska.  
 Arizona Republic — Phoenix Gazette, Ariz.  
 University of Arizona, Tucson, Ariz.  
 The Arkansas Science Fair Committee, Little Rock, Ark.  
 The Sacramento Bee, Calif. (Chico).  
 The Fresno Bee, Calif.  
 Los Angeles Times, Calif.  
 The Modesto Bee, Calif.  
 The Sacramento Bee, Calif.  
 San Bernardino Sun & Telegram, Calif.  
 San Diego Union, Calif.  
 San Francisco Bay Area Science Fair Association, Calif.  
 Joint Science Fair Committee, Colorado-Wyoming Bi-State Science Fair, Boulder, Colo.  
 Pueblo Chamber of Commerce, Colo.  
 The Hartford Times, Conn.  
 News-Journal Newspapers, Wilmington, Del.  
 Joint Board on Science Education, Washington, D. C.  
 The Miami Herald, Fla.  
 Florida Foundation for Future Scientists, Gainesville, Fla.  
 St. Petersburg Times, Fla.  
 Georgia Junior Academy of Science, Athens, Ga.  
 Atlanta Board of Education, Ga.  
 Fort Valley State College, Ga.  
 The Stars & Stripes, European Edition, Darmstadt, Germany.  
 Hawaiian Academy of Science and Associated Societies, Honolulu, Hawaii.  
 Rexburg Journal and Standard, Idaho.  
 American Society of Mechanical Engineers, Rock Island, Ill.  
 Bloomington Daily Herald-Telephone, Ind.  
 Crawfordsville Journal-Review, Ind.  
 The Evansville Press, Ind.  
 Fort Wayne Newspapers, Inc., Ind.  
 Hammond Times — Gary Tribune — Chicago Tribune (Ind. and Ill.).  
 Butler University, Indianapolis, Ind.  
 Lafayette Journal and Courier, Ind.  
 Muncie Star — Muncie Press, Ind.  
 North Manchester News Journal, Ind.  
 The Vidette-Messenger, Valparaiso, Ind.  
 Waterloo Daily Courier, Iowa  
 Yomiuri Shimbun, Tokyo, Japan.  
 Lawrence Journal-World — KLWN Radio, Kans.  
 The Salina Journal, Kans.  
 Topeka Daily Capital — Topeka State Journal, Kans.

Medical Society of Sedgwick County, Wichita, Kans.  
 Shreveport Times, La.  
 Northeast Louisiana State College, Monroe, La.  
 Louisiana Polytechnic Institute, Ruston, La.  
 Kiwanis Club of North Baltimore, Baltimore, Md.  
 The Washington Post and Times Herald, Washington, D. C.  
 Washington, D. C., Newspapers.  
 The Lowell Sun, Mass.  
 New Bedford Standard Times, Mass.  
 The Worcester Telegram and Evening Gazette, Mass.  
 The Detroit News, Mich.  
 The Flint Journal, Mich.  
 The Grand Rapids Herald, Mich.  
 The State Journal, Lansing, Mich.  
 The Mining Journal, Marquette, Mich.  
 Tri-County Science Fair Association, Midland, Mich.  
 Benton Harbor News Palladium — St. Joseph Herald Press, Mich.  
 Sebewaing Blade — Unionville-Akron Crescent, Mich.  
 Bemidji Pioneer, Minn.  
 Mayo Association, Rochester, Minn.  
 Delta Council Education Committee, Stoneville, Miss.  
 The Clarion-Ledger, Jackson, Miss.  
 Cape Girardeau Southeast Missourian, Mo.  
 Kansas City Star, Mo.  
 St. Louis Post-Dispatch, Mo.  
 Eastern Montana College, Billings, Mont.  
 Butte Regional Science Fair Association, Mont.  
 Montana State University News Service, Missoula, Mont.  
 Goos County Democrat, Lancaster, N. H.  
 Greater Newark Science Fair Committee, Newark, N. J.  
 Rutgers — The State University, New Brunswick, N. J.  
 Science-Mathematics Society of North Jersey, Teaneck, N. J.  
 Trenton Evening Times, N. J.  
 Albuquerque Journal, N. Mex.  
 The New York Mirror (Boroughs of Bronx, Brooklyn, Manhattan, Queens, and Richmond), N. Y.  
 Pittsburgh Press Republican, N. Y.  
 Westchester County Publishers, Inc., White Plains, N. Y.  
 North Carolina Academy of Science, Durham, N. C.  
 Elks Lodge No. 1216-BPOE, Devils Lake, N. Dak.  
 Walsh County Record, Grafton, N. Dak.  
 The Jamestown Sun, N. Dak.  
 Mandan Pioneer — Bismarck Tribune, N. Dak.  
 Minot Daily News, N. Dak.  
 Valley City Times Record, N. Dak.  
 Archbold Buckeye, Ohio.  
 The Cleveland Press, Ohio  
 Technical Career Advisory Committee, Bartlesville, Okla.

The Vista, Central State College, Edmond, Okla.  
 University of Oklahoma, Norman, Okla.  
 Daily Oklahoman — Oklahoma City Times, Okla.  
 The Tulsa Tribune, Okla.  
 Call-Chronicle Newspapers, Allentown, Pa.  
 The Patriot and The Evening News, Harrisburg, Pa.  
 Bucknell University, Lewisburg, Pa.  
 The Philadelphia Inquirer, Pa.  
 Reading Eagle-Times, Pa.  
 Providence Journal-Bulletin, R. I.  
 Augusta Chronicle and Herald, Ga.  
 The Charleston Evening Post — The News and Courier, S. C.  
 The State — Columbia Record, S. C.  
 Florence Morning News, S. C.  
 Greenville News-Piedmont, S. C.  
 The Charleston Evening Post, S. C.  
 Spartanburg Herald-Journal, S. C.  
 South Dakota State College, Brookings, S. Dak.  
 Rapid City Daily Journal, S. Dak.  
 State University of South Dakota — KVTV WNAX-570, Vermillion, S. Dak.  
 The Chattanooga Times, Tenn.  
 Tennessee Polytechnic Institute, Cookeville, Tenn.  
 The Knoxville News-Sentinel, Tenn.  
 Memphis Press-Scimitar, Tenn.  
 Nashville Banner, Tenn.  
 Abilene Reporter-News, Texas  
 Globe-News Publishing Company, Amarillo, Texas.  
 Austin Statesman, Texas.  
 Howard Payne College, Brownwood, Texas.  
 East Texas State Teachers College, Commerce, Texas.  
 Corpus Christi Caller-Times, Texas.  
 Southern Methodist University, Dallas, Texas.  
 El Paso Times, Texas.  
 Fort Worth Press — Fort Worth Star Telegram, Texas.  
 Houston Chronicle, Texas.  
 Avalanche-Journal, Lubbock, Texas.  
 San Antonio Evening News, Texas.  
 Waco Times-Herald, Texas.  
 Northern Virginia Sun, Arlington, Va.  
 Martinsville Bulletin, Va.  
 Norfolk Ledger-Dispatch — The Portsmouth Star, Va.  
 The Roanoke Times — The Roanoke World-News, Va.  
 The Spokesman-Review, Spokane, Wash.  
 Tacoma News Tribune, Wash.  
 Daily Telegraph Printing Company, Bluefield, W. Va.  
 Marshall College, Huntington, W. Va.  
 The Charleston Gazette — Charleston Daily Mail, W. Va.  
 Salem College, Salem, W. Va.  
 The Milwaukee Journal, Wis.

# NEW IDEAS OF SCIENCE

*- - how to find out about them*

Now you can get a 16-page illustrated service each week, tersely and compactly written, filled with news of science, important developments, new inventions, research — new ideas that can be helpful to you, information that you can find in no other single place.

Science News Letter, published by Science Service, the endowed institution organized in 1921, provides science information to business and professional people in all lines of work.

Its articles are prepared by trained scientist-writers who keep Science News readers informed, often in advance of even their technical journals, on such subjects as cancer research, nuclear physics, meteorology, surgery, news of scientific expeditions, electronics, continuing medical research, jet-propelled aviation, public health, paleontology, agriculture, entomology, gerontology, and countless other scientific subjects, as scientists discover new facts or new applications of old facts.

To make it inexpensive for you to find out whether Science News Letter is the weekly service you want, we offer you the next forty-one weeks of Science News Letter for \$3.13. That is \$3.02 less than the price of 41 weekly issues at 15c each.

Just fill in the trial subscription coupon below and mail it to us. You will not only save money by accepting this trial offer, but if you will mail the order card in now, we will add, with our compliments, a blue box or bulky envelope packed with objects of science, with explanations and suggested experiments, with museum-style exhibit cards, exactly as received by members of the group of scientists and others who regularly receive these "THINGS of science" units from Science Service.

WATSON DAVIS  
 Director, SCIENCE SERVICE

### As a special reward to you

for mailing this coupon NOW . . . we will send you WITH OUR COMPLIMENTS the Blue Box or Bulky Envelope packed with OBJECTS OF SCIENCE, as offered in our letter above.

YOU CAN RELY on what you read in Science News Letter because it is published by Science Service, the endowed non-profit institution whose Board of Trustees is nominated by the National Academy of Sciences, the National Research Council, the American Association for the Advancement of Science, the E. W. Scripps Estate and Journalistic Profession.

To SCIENCE NEWS LETTER, 1719 N. Street, N.W., Washington 6, D.C.

**MAIL ME THE NEXT FORTY-ONE WEEKLY SCIENCE NEWS LETTERS AND SEND BILL FOR \$3.13.**

or, \$3.13 is enclosed. (FOUR ISSUES extra if \$3.13 is sent now — more than TEN MONTHS for a little over half the price of a year's subscription, \$5.50.)

Name . . . . .

Address . . . . .

City . . . . . Zone . . . . . State . . . . .

And include WITHOUT EXTRA CHARGE the unit of science objects.