

1961

HONORS GROUP

IN

THE 20th ANNUAL

Science Talent Search®

for the

Westinghouse Science Scholarships and Awards

1961



SCIENCE CLUBS OF AMERICA

Administered By Science Service

1719 N STREET N. W. * WASHINGTON 6, D. C.

OOOPS! It's twins!

PLEASE CHANGE IN THE PHOENIX, ARIZONA LIST P.3. 20th STS HONORS

Farnbach, George Carl 17 North H. S. 536 E. Cheery Lynn
Variations in the Constituents and Preparations of
Grignard Reagents

Farnbach, John Sevier 17 North H. S. 536 E. Cheery Lynn
A Means of Hastening the Paper Chromatographic Analysis
of the Five Principal Sugars of Wood
(Farnbach is correct.)

The Meaning of Honors in the Science Talent Search

The achieving of Honors in the Science Talent Search, earned by the top 10% of those who complete entries in the Science Talent Search, is an evidence of science ability and interest which can be taken into consideration by colleges and universities in admissions and granting of scholarships. For this reason this Honors list is distributed to all the universities and colleges of the United States utilizing a list furnished by the American Council on Education.

All boys and girls awarded Honors in the Science Talent Search are considered so outstanding that any institution of higher learning will be justified in considering their abilities carefully.

In past years members of the Honors Group have made creditable records in the colleges and universities to which they have been admitted.

From this list of 399 honor awards, 40 are being chosen as winners of the Washington trip. Among these \$34,250 in scholarships and awards will be distributed. This list of winners is being announced subsequently to the distribution of this list and will be published in the Science News Letter of February 4, 1961, and it will be sent upon request accompanied by a self-addressed stamped envelope.

Each of those winning honors is being furnished with multiple certificates intended to accompany applications for college admissions and scholarships, but a listing in this pamphlet should be accepted as an equivalent certification.

The proportion of boys and girls in this list is determined by the ratio of boys and girls entering the contest. Listed are 93 girls and 306 boys. The girls determine their own chances in the Science Talent Search in accordance with the number that enter. Of the Honors Group, 68% of the boys and 78% of the girls rank in the upper 5% in their high school classes. Among the 399 who won Honors, 356 belong to science clubs of which 128 are affiliated with Science Clubs of America.

The Annual Science Talent Search

The Science Talent Search was the pioneering endeavor to discover at the senior high school year level those who have the potentialities to become the research scientists of the future. It has fulfilled this function far beyond the hopes entertained when this educational project was conceived. Many millions of dollars in scholarships in colleges and universities throughout the nation, supplementing the Westinghouse Science Scholarships, have been given to those who have thus been discovered to have high science talent.

This selection of those with research ability in science has become an institution and tradition due to approval from the educational world and the creditable records of winners in colleges, universities and professional positions.

In a real sense the annual Science Talent Search is more than a scholarship contest. It is a major step toward making scientific talent available for important tasks in our civilization. The participation of a great industrial organization in the financing of the annual Science Talent Search is a notable contribution to the advancement of science in America. This activity can be considered a support of "pure research" of importance equal to the fundamental researches in the Westinghouse Research Laboratories. Science and education are grateful for the financial support of the first twenty Science Talent Searches by the Westinghouse Educational Foundation, an organization endowed by the Westinghouse Electric Corporation for the promotion of education and science.

Science Service, engaged in the interpretation and popularization of science on a broad front, is proud of administering, through Science Clubs of America, the annual Science Talent Search. From the newspapers, educators and scientists of America there has been enthusiastic cooperation in this annual activity that means so much to high school seniors interested in science. The Science Talent Search is a continuing opportunity and responsibility of the more than 25,000 science clubs and more than 600,000 members affiliated with Science Clubs of America.

Honors Group in the Twentieth Annual Science Talent Search

* Indicates girls
H. S. Indicates High School
Title of project report submitted is on next line

HOME ADDRESS is underlined
AGE of winner follows name

ALABAMA

Birmingham 17 John Carroll H. S. 1749 Wellington Rd. 9
*Palmer, Joan Karen 17
Determination of the Nutritional Value of Various Carbohydrate Substances in White Rats
Stella, Mark Emil 16 John Carroll H. S. 800 48th Pl., Fairfield
Atmospheric Phenomena of Mars and Their Relationship to Nitrogen (IV) Oxide
McCoy, Norman Kitchens, Jr. 18 Ramsay H. S. 1116 So. 10th Pl. 5
Application of Photography in Astronomical Research
Morgan, Geoffrey Clyde 18 Shades Valley H. S. 1608 Barry Ave. 9
A Reverbatory Furnace
Hamner, George Fleming, Jr. 18 Tuscaloosa H. S. 51 Cherokee Hills
Linear Proton Accelerator

ARIZONA

Phoenix 17 North H. S. 2030 N. 18th St.
Cone, Robert Miller 17
Determination of the Constituents of Tobacco and Tobacco Smoke by Means of Paper Chromatography (Ascending Method)
Farnback, George Carl 17 North H. S. 536 E. Cherry Lynn
Variations in the Constituents and Preparations of Grignard Reagents
Fitzgerald, John William 17 North H. S. 51 E. Hoover St.
Color Reaction of 2,6-Dibromo-N-chloro-p-quinoneimine with Thiophosphate Insecticides on Paper Chromatograms
*Gonzalo, Frances Ann 17 North H. S. 708 E. Coronado
A Demonstration of the Secretion Phenomenon by the Ouchterlony Double-Gel Diffusion Process
Jordan, Michael Lynn 17 North H. S. 2246 E. Yale St.
Electrophoresis of Proteolytic Enzymes at Various pH Levels
Breitner, John Carl 16 Phoenix Union H. S. Box 234, Cave Creek
Isolation of L-Arabinose from Agave Leaves
Fox, Donald Jensen 17 West H. S. 2314 W. Pinchot St.
New Positive Qualitative Differentiation of the Sodium and Potassium Ions by the Application of F-centers
Puckett, Jason Niles, Jr. 18 West H. S. 3316 N. 17th Ave. 15
Design and Construction of an Electrometer
Rottmiller, Edmund Henry 17 West H. S. 2121 W. Medlock Dr.
A Working Demonstration of the Millikan Oil-drop Experiment
Kaderhan, Norman Stanley 17 Tucson H. S. 3445 Calle Alarcon St.
Metabolism in Regenerating Planaria

ARKANSAS

Little Rock 17 Hall H. S. 4316 Lee Ave.
Vaughan, Richard Simpson 17
Effect of Triethyleneimine on Reproductive Capacity of Frog Spermatozoa *in vitro*

CALIFORNIA

Alherton 17 Menlo-Alherton H. S. 330 Sherwood Way, Menlo Park
Rosen, Steven David 17
Effects of Electric Charge on the Surface Tension of Liquids
Rundel, Philip Wilson 17 Menlo-Alherton H. S. 1195 Hillview Dr., Menlo Park
Ecological Studies of Cenozoic Foraminifera
Neidengard, Lee 17 Nathaniel Narbonne H. S. 4068 Hawthorne Ave., Palos Verdes Estates
Effects of Hypothermia and Hyperthermia on the Rate of Antibody Production Against Human Serum in Mice
Quander, Harold Lawrence 16 Nathaniel Narbonne H. S. 1726 265th St.
Calculating the Orbital Elements of an Asteroid

Thompson, Peter Van Zandt 17 Nathaniel Nardonne H. S. 1032 Via Nogales, Determning the Equaton of Nodal Lines Palos Verdes Estates
 Menzies, Robert Thomas 17 Long Beach Polytechnic H. S. 3441 Myrtle Ave. 7
 Solutions of Certain Diophantine Problems by Functional Methods
 Sibley, Robert Woolsey 17 Red Bluff Union H. S. 1550 Garrayna Dr.
 Characteristic Properties of Alpha Ray Absorption
 In Air and Other Gases
 Sauter, Charles Leonard 17 Cleveland H. S. 8031 White Oak Ave.
 Photoactivation
 Ridgecrest *Platt, Karen Elizabeth 16 Shortman E. Burroughs H. S. Rademacher View
 A Mechanical Generator for Lissajous Figures
 San Rafael Phelps, Donald Earl 17 San Rafael H. S. 57 Junipero Serra Ave.
 Purification of Phosphoglyceromutase
 Santa Barbara Gulbranson, Rolf Norman 17 Santa Barbara H. S. 719 Alston Rd.
 Analysis of Radioisotopes by Alpha-Particle Range Detection
 Studio City *Wiele, Louise Mary 17 Corvallis H. S. 6920 Woodman Ave., Van Nuys
 Thinking Machines and the Thought Behind Them
 Van Nuys Fine, Robert Elliot 16 Birmingham H. S. 17118 Willard St.
 Studies on Lung Structure and Water Conservation in the
 Desert Iguana, Dipsosaurus dorsalis

COLORADO

Boulder Armstrong, Leonard James 17 Boulder H. S. 905 15th St.
 Production of Viable Seeds of the Alpine Tundra
 Colorado Springs Hanson, Carl Veith 17 Cheyenne Mountain H. S. 205 Alsace Way
 Determining the Possibilities of Supplementing Visual or
 Auditory Senses with the Tactile Sense
 Denver Chesson, Douglas Howell 17 East H. S. 6301 E. 22nd Ave. 7
 The Role of Luteinizing Hormone in Testicular Tumorigenesis
 in Balb/C Mice

CONNECTICUT

Fairfield Miller, Gary Logan 17 Fairfield College Preparatory School 1180 Merwin's
 Analysis of a Long Period Horizontal Lane, Westport
 Seismometer System Including a Solid State Amplifier and
 a Graphic Recorder

DISTRICT OF COLUMBIA

Washington Herrin, Dennis Winton 17 Anacostia H. S. 1611 Fairlawn Ave., S. E. 20
 Quantitative and Qualitative Analysis of Gases in Blood
 Samples by Gas-Solid Chromatography
 *Burns, Martha Anne 17 Immaculata H. S. 6138 30th St., N. W. 15
 Effect of Osmium Tetroxide Buffer to pH 8.5 on the
 Fine Structure of Spirostomum ambiguum
 Dobbs, Leland George 17 The Sidwell Friends School 7401 Western Ave.,
 Effect of Ipronzaid on Red Blood Cell N. W. 15
 Production in Rats
 Newton, Michael Clarke 17 Western H. S. 3714 Massachusetts Ave. 16
 Quantitative Study of the Mollusk Population of
 Lower Calvert Formation
 Vacher, Henry Leonard 17 Western H. S. 2317 Huldkeoper Pl., N. W. 7
 Quantitative Correlation of the Heavy Minerals in Sediments
 to Those in the Bedrock of the Rock Creek Tributaries
 *McCanner, Rosalie Ann 17 Woodrow Wilson H. S. 2822 Kanawha St., N. W.
 Study of the Nutritional Requirements of Spirostomum ambiguum 15

FLORIDA

Bradenton *Vary, Judyth Anne 17 Manatee H. S. 4402 Pompano Lane, Palmetto
 The Chemotherapeutic Action of AET and MEA plus 2M-DHTP
 on Irradiated Cardnomous and Normal Tissues in White Mice
 Coral Gables *Finerty, Donna Elizabeth 17 Coral Gables Sr. H. S. 630 San Lorenzo 46
 Embryonic Chick Heart as a Biological Thermometer
 Gravitz, Norman 17 Coral Gables Sr. H. S. 5250 S. W. 2nd St., Miami 44
 Properties of the Hyaline Plasma Membrane of the Lytechinus variegatus
 Gross, Leslie Jay 16 Coral Gables Sr. H. S. 6380 S. W. 62nd Terr.,
 Comparative Survey of the Salinity Tolerances of Seven S. Miami 43
 Species of Shallow-Water Hermit Crabs of the Families,
 Paguridae and Diogenidae

*Kamp, Katherine Marland 16 Coral Gables Sr. H. S. 1534 Ancona Ave. 46
 Fungal Infection of Submerged Cordage and Concurrent
 Enzymatic Activity
 Kirsch, Warren Robert 17 Coral Gables Sr. H. S. 3660 S. W. 12th St.,
 Synthesis of Schiff Bases as Potential Anticancer Agents Miami 35
 McCordopale, Donald Sinclair, Jr. 17 Coral Gables Sr. H. S. 3680 Royal
 Incidence of staphylococcus in High Palm Ave., Miami 33
 School Students
 *Watson, Eloise Ann 17 Coral Gables Sr. H. S. 1507 S. W. 19th Terr.,
 The Finite Solid Geometry System Miami 45
 Platt, Jeffrey Mark 17 Coral Gables Sr. H. S. 4519 S. W. 16th St.,
 An Investigation of the Phenomenon of Tidal-
 Induced Fluctuations in a Restrictied Estuarine Channel Miami 34
 Scott, Michael McCreary 17 Gainsville H. S. 1515 N. W. 5th St.
 Induction Heaters
 *Most, Sheila Marie 16 Boca Ciega Sr. H. S. 1908 56th St., So.,
 Natural Fluoridation and Its Relation to the St. Petersburg 7
 Paleo-Odonology of Two Prehistoric American Indian Tribes
 Adkins, William Milton III 17 Melbourne H. S. 67 Lund Circle
 Pineal Regulation of the Water Metabolism and
 Behavior of Bufo terrestris
 Raysdale, Charles William 17 Leon H. S. 308 N. Delview
 Electroencephalography

GEORGIA

Atlanta Kane, Daniel Frederick, Jr. 17 Joseph E. Brown H. S. 1626 Rogers Ave.,
 Dependence of Color and Stability of Gold S. W. 10
 Hydrosols on Amount of Tannin Used
 *Ward, Joan Helen 17 Joseph E. Brown H. S. 1980 Cascade Rd. 11
 Parallel Changes in Physical Properties and Odors
 of the Aliphatic Esters
 *Purvis, Virginia Marilyn 17 Druid Hills H. S. 2222 Tanglewood Rd.,
 Gamma Ray Irradiation Effects on Corn and Beans Decatur
 Maddox, James Hunt, Jr. 17 Henry Grady H. S. 130 Little John Trail, N. E.
 Physical and Chemical Properties of Fall-Line Kaolins of Georgia
 Gidlo, Thomas Lloyd 17 Murphy H. S. 1378 Metropolitan Ave. 16
 Increasing Gain and Efficiency in Low Frequency Antenna Systems
 Hostford, James Michael 17 Northside H. S. 1080 Northliffe Dr., N. W. 18
 Molt-Controlling Hormone of Crayfish, Its Characteristics and Basis
 for Possible Application in Medicine

IDAHO

Genesee Hobben, Richard Dale 17 Genesee H. S. Genesee
 Application of Relay Circuits to the Syllogism and to the
 Reductio ad Absurdum Method of Propositional Calculus
 Idaho Falls Arrington, John Sherwood 17 Idaho Falls H. S. 795 Saturn Ave.
 Static Testing of a Liquid Fuel and Solid Fuel Rocket Propulsion System
 Kunter, Richard Satn 17 Idaho Falls H. S. 1228 9th St.
 Induction Heating
 Wheeler, John Craig 17 Idaho Falls H. S. 239 11th St.
 A Point-Emitter Colliding-Beam Proton Accelerator
 Bogard, Charles Edward 17 Payette H. S. 500 S. 12th St.
 New Concept of Benzene Bond Resonance

ILLINOIS

Chicago Dworkin, Barry Ronald 16 Amundsen Sr. H. S. 2630 W. Rascher St. 25
 Determination of the Sensitive Period in the Division
 Cycle of Escherichia coli
 Hochfeld, William Leslie 16 Bowen H. S. 9010 S. Jeffrey Blvd. 17
 Acetylcholine Content of the Regenerating Forelimb of the
 Adult Newt
 Keys, Thomas III 16 Hirsch H. S. 7701 S. Evans Ave. 19
 Plasma Dynamics
 Steben, Bruce Michael 17 St. Patrick H. S. 1412 N. Mason Ave. 51
 Adaptation of a Digital Computer to Pattern Recognition
 Greene, Lloyd Asher 16 Nicholas Seann H. S. 6506 N. Talman 45
 Characterization of the Flavonoid Pigments of
 Roses Using Paper Chromatography

*Schwartz, Marlene Roberta 17 Nicholas Senn H. S. 2655 W. Albion Ave. 45
 Paper Chromatography of Amino Acids
 Coustan, Donald Ross 17 South Shore H. S. 7817 S. Phillips Ave. 49
 Trypanosoma lewisi Infections in White Rats: Presence and
 Effects of Adiastrin
 Fried, Victor Arnold 17 South Shore H. S. 7530 Merrill St. 49
 Kinetics of the Urea-Urease Reaction
 Pinsky, Howard Joel 17 Sullivan H. S. 1521 W. Fargo 26
 Effects of Radiation on Chemicals
 Resan, Steven Alfred 17 George Washington H. S. 10027 Avenue N. 17
 Changes in the Thermal Conductivity of the Phenol-
 Formaldehyde Polymer Due to the Addition of Sucrose
 Eichelman, Burr Simmons 17 Community H. S. 748 Chicago Ave.
 Physiological Effects of "Nervine"
 Ryback, Wayne Howard 17 Community H. S. 6950 Route #53
 Effects of Irradiation on the Transmission Spectrum of Sodium Nitrate
 Art, Richard Carl, Jr. Evanston Twp. H. S. 3000 Thayer St.
 Correlation of the Index of Refraction, Molecular Weight,
 Lattice Spacing and Density in Cubic Crystals
 Axelrod, Robert Marshall 17 Evanston Twp. H. S. 8835 Monticello Ave.,
 Hypothetical Life Forms and Environments by
 Computer Simulation
 Brauer, Howard Morris 16 Evanston Twp. H. S. 149 Calkin Ave.
 Effects of pH on the Formation of Tantalum Oxide
 Chamberlain, John Paul 17 Evanston Twp. H. S. 2246 Sherman Ave.
 Design and Construction of a Bubble Chamber
 Elin, Leon Roland 17 Evanston Twp. H. S. 8727 Ridgeway Ave., Skokie
 Modification of Stoke's Law
 Hedeem, Stanley Earl 17 Evanston Twp. H. S. 3115 Central St.
 Study of Ecological Recession
 Lewis, Jonathan David 17 Evanston Twp. H. S. 1033 Wesley Ave.
 Effects of Some Synthetic Detergents on Plants
 Morton, John Elliott 17 Evanston Twp. H. S. 1645 Ridge Ave.
 Complexes of Lead 2, 6-Dimethyl-4-thiopyrone and the Halogens
 *Peterson, Nancy Carol 17 Evanston Twp. H. S. 1415 Fowler Ave.
 Paper Chromatography in Amino Acid Separations
 Roe, Frank Lewis 17 Evanston Twp. H. S. 2520 Harrison St.
 Thiopyrone Copper Complexes
 Schnaer, William Joseph 17 Evanston Twp. H. S. 8933 Forestview Ave.
 Investigation into the Effects of Reduced Pressure on the
 Rates of Various Chemical Reactions
 *Stolar, Merle Sharon 17 Evanston Twp. H. S. 8629 N. Trumbull, Skokie
 Effects of Some Anesthetic Substances Upon Single-Celled Animals
 Vickers, George Ross 17 Evanston Twp. H. S. 1126 Oak Ave.
 Some Preliminary Considerations on the Elementary Nature of the Photon
 Pnietz, Douglas Phillip 17 Glenbard West H. S. 603 Phillips Ave.
 Measuring Ability to Learn by Conditioned Response in Mice
 McGivern, Thomas John 17 Highland Park H. S. 347 Elm Pl.
 Enzyme-Substrate Complex
 *Latz, Jean Ann 17 St. Francis Academy 605 N. Hickory St.
 A Study of Catalysts
 Bailey, Peter Tone 17 Lyons Twp. H. S. 5417 Country Club Dr.
 Analysis of Softened Water
 Lubin, Donald Paul 17 Lyons Twp. H. S. 5646 Howard Ave.
 Relative Numbers of the Kinds of Ions in Air Irradiated with Gamma Rays
 Phillips, Roger Morgan 16 Lyons Twp. H. S. 5434 Grand Ave., Western
 The Peaceful Atom at Work
 Miller, Robert Alan 17 Prospect H. S. 213 S. Windsor Dr., Arlington
 Photon Size
 *Bonin, Sylvia Evelyn 16 Glenbrook H. S. 2422 Central Rd., Glenview
 Experiments with the Land Phenomenon
 *Butkus, Julia Dalia 17 No. Chicago Community H. S. 1510 Lincoln St.
 Preparation of Gibberellic Acid Compounds
 *Smith, Sandra Joyce 17 Carl Sandburg H. S. 9003 W. 126th St., Palos Park
 The Land Color Theory
 Johnson, Mark Hartman 16 Maine Twp. H. S., East 7624 Maple St., Morton
 Factors Determining the Nature of Multiplication
 Tables for Permutations

*Moehring, Martha Lillian 16 Maine Twp. H. S., East 634 Wisner St.
 Metallic Crystals and the Thermoelectric Effect
 INDIANA
 Angola
 Steele, William Kenneth, Jr. 18 Angola H. S. 407 W. Felicity
 An Experiment in the Proton Magnetic Resonance of Water
 Judd, Arthur Reed 17 University H. S. 1310 Atwater Ave.
 Possible Existence of a Correction Factor for Improvement
 of Stellar Magnitude Determinations
 *Shortt, April Irene 17 Crawfordsville Jr. -Sr. H. S. R. R. 3
 An Investigation of Horse Sense
 Crawfordsville
 *Peterson, David Lee 17 Delphi H. S. R. R. 1, Box 25
 A Step-by-Step Dial Telephone System for Use on the Farm
 Kushner, Sidney Ralph 17 Benjamin Bosse H. S. 621 S. Norman Ave. 14
 Generation of Alternating Current from an Electrochemical Cell
 Robertson, Charles William, Jr. 17 Benjamin Bosse H. S. 502 S. Lincoln
 Possibilities of Electroluminescence in the
 Transmission of Color Modulated Light Signals
 Stevens, John Galen 17 Benjamin Bosse H. S. 1509 Henning Ave. 14
 Design and Lampworking of a Constant Level Water Distillation Apparatus
 Hirschfelder, John Joseph 17 Central Catholic H. S. 4123 Hoagland Ave. 6
 Geometrical Foundations of the Theory of Relativity
 Berg, Samuel William II 17 Hammond H. S. 8523 Schreiber Dr., Munster
 Effect of Darkness on the Feeding Habits of Guinea Pigs
 Brusch, Richard Gerald 17 Hammond H. S. 8646 Walnut Dr., Munster
 Testing the Characteristics of Small Delaval Type
 Rocket Nozzles Using Compressed Air
 *Prusiecki, Linda Lou 17 Hobart Sr. H. S. 225 E. 11th Pl.
 Variations in Prevalence and Anatomy Among Terrestrial,
 Aquatic and Air Insects
 *Goode, Martha Lee 17 Emerich Manual Training H. S. 2117 E. Raymond
 Construction and Operation of a Colorimeter Spectroscope St. 3
 as Used in the Analysis of Human and Animal Blood
 *Worling, Linda Louise 16 Emerich Manual Training H. S. 1506 Barth
 Leukocytic Changes in Escherichia coli Infection Ave. 3
 of Albino Rats
 Bolln, Stephen Ray 17 Harry E. Wood H. S. 924 Wright St. 3
 A System for the Conversion of Rotary Motion to Unidirectional Motion
 Settle, Wayne Lee 17 Portland-Wayne Twp. Sr. H. S. R. R. 1, Keystone
 Mutations Produced by the Irradiation of German Millet Seeds
 Wehly, Stephen Phillips 17 Portland-Wayne Twp. Sr. H. S. 927 W. High St.
 Nuclear Research Experimentation and Visualization with
 a Continuous or Diffusion-Type Cloud Chamber
 Emry, Donald Charles 18 Sheridan H. S. R. R. #1
 Roads of the Future
 Sheridan
 Ferrell, Richard 17 Central H. S. 117 W. North Shore Dr. 17
 An Analysis of the Vegetation in an Abandoned Gravel Pit
 Peters, Roger Paul, Jr. 17 Central H. S. 557 Edgewater Dr.
 Gas Chromatographic Determination of Free Energy
 in 1-Chloro-1-propene
 Raymond, Robert Lee 17 Central H. S. 1205 N. Kaley 28
 A Study of the Process of Root Initiation
 *Fry, Markanna Jo 17 Garfield H. S. 1316 N. 7th St.
 Hydrolysis of Cellulose into Reducing Sugars
 IOWA
 Bettendorf
 Young, Kenneth Duane 17 Bettendorf H. S. 2544 Oak St.
 Investigation and Application of the Magnus Effect
 *Wilson, Mary Sue 17 Malcolm Price Laboratory School 1203 W. 23rd St.
 Studies in Bacterial Mutation
 Ottumwa
 Ekwall, Jack Eugene 17 Ottumwa H. S. 825 Glenwood St.
 Transformer Controller
 Stevens, Charles Gordon 17 East H. S. 3308 Garretson Ave. 6
 Design and Construction of a Solid-State Digital Computer
 West Des Moines
 *Gerald Cecil 17 Valley H. S. RFD #1, Cumming
 Analysis of the Motion of Masses Connected in a Straight Line by Springs

- KANSAS
- Great Bend Miner, Robert Nelson 17 Great Bend Sr. H. S. 2824 Paseo Dr.
- Shawnee Mission *Holzman, Joanne Marie 17 Bishop Meege H. S. 5707 Dearborn St., Mission
Penicillin-Resistance of Staphylococci from Children
on Continuous Prophylactic Treatment and from Normal Controls
- Wichita Gresham, Michael Arthur 17 Wichita H. S., Southeast 2516 N. 95th St., E. R #3 20
Lunar Photodopography
- KENTUCKY
- Louisville Kleinman, Daniel Ellis 17 Aberton H. S. 1414 Goddard Ave. 4
An Investigation of the Twin Primes Problem
- LOUISIANA
- Baton Rouge Harris, Rano Joseph, Jr. 16 Baton Rouge H. S. 840 Ingleside Dr.
Research Work in Gas Chromatography
- MAINE
- East Millinocket *Henderson, Julia Anne 18 Schenck H. S. Palm St.
Effects of Analgesics on Mice
- MARYLAND
- Bladensburg Andrews, Thomas Gaylord, Jr. 17 Bladensburg Sr. H. S. 5903 Euclid St., Cheverly
Interfacial Polycondensation
- Catonsville *Kotite, Margaret Ellen 17 Bladensburg Sr. H. S. 3209 Tremont Ave., Cheverly
Sugar-Born Complexes
- Gambrells *Youle, Merry Carol 17 Catonsville Sr. H. S. 2 Montrose Ave., Baltimore 28
Inheritance of an Eye Defect in Hamsters
- Rockville Huggins, Stephen Richard 17 Arundel Sr. H. S. 50 Highland Dr., Millersville
Theory and Practice of the Half-Life
Formula in Radiation and Nuclear Decay
- Silver Spring *Shaw, Mary Margaret 17 Walter Johnson Sr. H. S. 9615 Montgomery Dr., Bethesda 14
Pattern of Ossification in the Chicken Embryo
*Neisen, Margaret Ann 17 Richard Montgomery H. S. R #2, Great Falls Rd.
Investigation of the Interference Phenomenon in Rabbit Test Systems
Jordan, Steven Lee 17 Montgomery Blair H. S. 9205 Sudbury Rd.
Geometric Implications of an Algebraic Equation
- MASSACHUSETTS
- Arlington Sprinkle, James Thomas 17 Arlington H. S. 440 Concord Turnpike 74
Pentrenites, Apex of the Blastoids
- Braintree Krabek, Charles Burleigh 17 Thayer Academy 10 Off Grove St., East Weymouth 89
Studies in High Resolution Nuclear Magnetic Resonance
- Framingham Aron, Carl Robert 17 Framingham H. S. 38 Lohnes Rd.
Diurnal Migration in Plankton Animals
- Hull Finlgan, Robert Charles 17 Framingham H. S. 28 Lyman Rd., Framingham Center
Growth Patterns and Chromosomal Aberrations in Plant Cells in a Liquid-Medium Tissue Culture Environment
*Raymond, Eileen Bardwell 17 Hull H. S. 3 Holbrook Ave.
Amino Acid and Carbohydrate Composition of the Toadfish Chorion
- Lexington *Blat, Diane Leah 17 Lexington H. S. 7 Rockville Ave. 73
Investigation of the Physiological and Chemical Composition of Nissl Substance
- Millbury Owen, Bruce Manning 17 Millbury H. S. Birchwood Dr., Holden
Grain Structure of Metals
- Natick Anstey, Robert Leland 17 Natick H. S. 11 Brookdale Rd.
Fossil Age Correlation by Amino Acid Content
- Needham Zeise, Frederick Fulton 17 Needham H. S. 207 South St. 92
Design, Construction and Use of an Electroencephalograph
- Norwood *Slitt, Ann Elizabeth 17 Norwood Sr. H. S. 777 Neponset St.
Determining the Population of Bacteria in the Rhizospheres of Banana Roots
- Quincy Hoffman, Donald Richard 17 North Quincy H. S. 80 Furber Hill Rd.
Oxidations of Steroids by Intact Bacterial Cells
Wollaston 70
- Revere *Ceccre, Mary Ann 17 Revere H. S. 300 Malden St. 51
Two Methods for Measuring Germicidal Effects of Disinfectants
- South Hadley
- Springfield Shuster, Malcolm David 17 Revere H. S. 82 Kimball Ave. 51
Effect of Temperature, Relative Humidity Difference and Plasticizer on the Permeability of Plastic Films to Water Vapor
- Ware Dufresne, Richard Frederick 17 South Hadley H. S. 337 E. State St., Grandby
A Mathematical Dye Synthesis
- Westwood Bass, Martin Clark 16 Classical H. S. 178 Commonwealth Ave. 8
Effect of Cranial X-Irradiation on the Activity of Rats
LaFlamme, Paul Henry 18 Ware H. S. 32 Highland St.
Performance of Variations in Neoprene Compared with Natural Rubber
Hughes, Allan George 17 Westwood Sr. H. S. 69 Loring St.
Magic Squares
- Wilmington Knitter, James Bruce 17 Westwood Sr. H. S. 38 Gloucester Rd.
Reduction of Transmitted Bandwidth
- Ann Arbor Nelson, Peter Augustus 17 Wilmington H. S. 57 High St., No. Wilmington
Effect of Excess Gravity on Plant Growth
- Beaverton Vandenbroek, Jan Abraham III 17 Ann Arbor H. S. 1128 Birch Ave.
An Experimental Ultrasonic Generator
- Dearborn Knapp, Larry De-Wayne 19 Beaverton H. S. 4399 Roehrs Rd.
Formulating a Four-Dimensional Space-Time Geometry
- Detroit Lutz, Donald Stephen 17 Sacred Heart H. S. 22302 Cleveland St. 8
Effects of Alpha Radiation on Bean Seeds
- Flint Tedeschi, Philip Joseph 17 Sacred Heart H. S. 3761 Williams St. 8
Use of Grains to Improve Amateur Rocketry
- Flint Slamon, Robert Samuel 16 Cass Technical H. S. 18700 Whitcomb St. 35
Effects of Radiolotopes of Iron on the Appearance of Erythrocytes
*MacVicar, Margaret Love Agnes 17 Flint Central H. S. G-6460 Detroit St., Mt. Morris
A Study of the Life Cycle and Anatomy of the Artemia salina
DuMoucheil, William Hermas 17 St. Michael H. S. 1806 Parkfront St. 4
Mathematics Makes a Decision
- MINNESOTA
- Mankato Kearney, Wynn Rochlort 17 Mankato H. S. 101 Goodyear Ave.
Effects of X-Ray Radiation on Rats
- Minneapolis *Harper, Nicki Diane 17 St. Margaret's Academy 2643 Webster Ave. 16
Exploring Hydrogen Bonding with Lithium Hydride
Barrett, John Neil 17 Lourdes H. S. 1105 12th Ave. N. E.
A New Interpretation of the Role of Antigen-Antibody Reaction in Chemical Hypersensitivity
- Rochester Tilff, William Watson 16 Alexander Ramsey H. S. 2195 Arcade St. 9
Factors Affecting Muscle Fatigue
Palmen, Michael Allen 17 Wabasha Public H. S. West Main St.
Effect of Heat Dissipation by an Electromagnetic Field
- MISSISSIPPI
- Biloxi Shardella, Edward Francis, Jr. 17 Biloxi H. S. 148 Pringle Circle
Determination of Radioactivity Levels
- Clinton Brown, Harry Cooper, Jr. 17 Clinton H. S. 107 Elcrest, Jackson 9
Studies on Crown Gall
- MISSOURI
- Kansas City Barriss, Bernard George, Jr. 15 Southeast H. S. 6319 S. Benton 32
Determining Index of Refraction of a Solid from Its Sedition by Means of the Michelson Interferometer
- Lebanon Johnson, Michael Lillard 17 Lebanon H. S. Smith Acres
Experimental Linear Accelerator
- NEBRASKA
- Omaha Josephson, Paul Douglas 17 Omaha Central H. S. 1507 N. 54th St. 4
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Nazareth Miller, Walter Luther 16 Nazareth Area Sr. H. S. Box 514, Cherry Hill Original Process for Extraction of Cesium Metal RD #3
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Philadelphia Dobkin, Robert Curtis 17 Central H. S. Sutton Terrace, 50 Belmont Ave. Research in Thermoelectrics

Pittsburgh *Byrnan, Patricia Ann 16 Sacred Heart H. S. 213 Dorseyville Rd. 15 Effects of Sodium Fluoride on Plants and Animals

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Weinberg, David Robert 17 Oak Ridge H. S. 111 Moylan Lane Mathematical Aspects of Population Growth

*Sanders, Sandra Sue 17 Bledsoe County H. S. P. O. Box 24 Study of Relativity as Connected with the Phenomena of a Diffusion Cloud Chamber

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Alexandria Cone, John Martin, Jr. 16 F. C. Hammond H. S. 4542 Lassalle Ave. Water Bubbles

Arlington Jones, Edward Charles 17 Wakefield H. S. 6807 N. 29th St. 13 Convex Smooth Curves

Baer, Robert Clinton, Jr. 17 Washington-Lee H. S. 4329 24th St. N. 7 Possible Role of the Leukocyte in Tolerance to the Pyrogenicity of Bacterial Endotoxins

Fairfax Finegan, Michael Joseph 18 Fairfax H. S. Rt. 1, Box 4, Fairfax Station A Study of Factors Which Affect the Chromic Acid Oxidation of 1-Ethyl-2-nitrobenzene

McLean Souders, Thomas Michael 17 McLean H. S. Rt. 1, Box 136, Great Falls Development of a Liquid Freon Bubble Chamber

Richmond Mitchell, Archer Sylvester, Jr. 17 Maggie L. Walker H. S. 2400 Lang- Electrophoretic Study of the Effect of pH on Precipitation of Rabbit Serum Proteins by Sodium Lauryl Sulfate

WASHINGTON

Deming Mideke, Michael Louis 17 Mount Baker H. S. 1906 E. Sunset Dr., Bellingham Planning and Construction of a Radio Telescope

Everett *Kling, Leslie May 17 Everett H. S. 1112 Colby Ave. Effects of Prenatal Hypoxia on Early Postnatal Development

Spokane Ashurst, Parker Kirk 17 Lewis and Clark H. S. 3723 S. Tekoa 36 Electric Fields and Colloidal Smoke

WEST VIRGINIA

Charleston Hills, Henry Monroe 17 Stonewall Jackson H. S. 122 Swarthmore Ave. 2 Teratogenic Effects of Iodine-131 in Chick Embryos

*Ingram, Doris Ann 17 Stonewall Jackson H. S. 806 Main St. 2 Styrofoam Models for the Illustration of Metallic Crystal Lattices

Fairmont Meredith, Jamison, Jr. 17 Fairmont Sr. H. S. 925 Farms Dr. Factors Influencing Spore Germination in the Fungus

Kenova Brooks, Thomas Hoke 17 Buffalo H. S. 2451 Spring Valley Dr., Huntington Rate of Electron Exchange Between Mercurous and Mercuric Ions in Nitric Acid Solutions by Nuclear Magnetic Resonance

Morgantown Gwynne, John Thomas 17 Morgantown H. S. 241 Rutewood Ave. Nuclear Magnetic Resonance and a Magnetic Resonance Spectrometer

Weirton Wojdyla, John Robert 17 Madonna H. S. 165 Powers Rd. Initial Spectrographic Investigations with a Wood Spectrometer

WISCONSIN

Kenosha Moeller, John Anthony 17 Mary D. Bradford H. S. 7413 10th Ave. Digraph Substitution Ciphers

Milwaukee Jahnke, James Arthur 17 Custer Sr. H. S. 5145 N. 55th St. 18 Silicone Rubber (Synthesis and Properties)

*Gibson, Nancy Janet 17 Nicolet H. S. 1526 W. Larkspur Lane 17 Effects of Beta-Radiation on Euplexia gracilis

Remmel, Ronald Sylvester 17 Nicolet H. S. 2721 W. Raleigh Ave. 9 Rate of Ion Migration

Winnik, Mitchell A. 17 Nicolet H. S. 538 W. Apple Tree Rd. 17 A Study of the Phosphorus Oxychloride Acid-Base System

Surgeon Bay Logerquist, David Russell 17 Sevastopol H. S. Bailey's Harbor
Waukesha Response of Baby Chicks to Selected Hormones
1111ngsworth, Roberta Ann 17 Waukesha Sr.-H. S. 1222 N. Hartwell Ave.
Radiation Effects on Dicotyledonous Seeds

STATE SCIENCE TALENT SEARCHES

All State Science Talent Searches are authorized by special arrangement with Science Clubs of America. Those desiring information on or details of the results of State Science Talent Searches should send their inquiries to the Directors in the respective states. For a prompt reply, send a stamped, self-addressed envelope with your inquiry.

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- Alaska: University of Alaska
- Dr. Wm. S. Wilson, Head, Depts. of Chemical Engineering and Chemistry, University of Alaska, College
- Arkansas: Arkansas Academy of Science
- Dr. Leo Paulussen, Asst. Prof. of Bacteriology, University of Arkansas, Fayetteville
- Connecticut: Connecticut Academy of Arts and Sciences
- Dr. David J. Blick, Assoc. Prof. of Science Education, University of Connecticut, Storrs
- District of Columbia: Washington Academy of Sciences
- Dr. Leo Schubert, Chm., Div. of Nat. Sciences and Math., American University, Washington
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- Dr. Luther Arnold, College of Education, University of Florida, Gainesville
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- Iowa: Iowa Academy of Science
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- New Hampshire: New Hampshire Academy of Science
- Dr. R. I. Blieckle, Prof. of Entomology, University of New Hampshire, Durham
- New Mexico: New Mexico Institute of Mining and Technology
- Dr. Joseph A. Schulte, Prof. of Chemistry, New Mexico Institute of Mining & Technology, Socorro
- North Carolina: North Carolina Academy of Science
- Dr. Herbert Speece, Dept. of Mathematics, North Carolina State College, Raleigh
- North Dakota: North Dakota Academy of Science
- Prof. Fred Sands, School of Chem. Tech., North Dakota State University, Fargo
- Oklahoma: Oklahoma Science Service
- Dr. Horace E. Hoffman, Oklahoma Science Service, University of Oklahoma, Box 1120, Norman
- Oregon: Oregon Academy of Science
- Mr. Raymond E. Barrett, Educ. Dir., Oregon Museum of Science and Industry, 4015 S. W. Canyon Road, Portland
- Pennsylvania: Pennsylvania Academy of Science
- Dr. William Urticchio, Head, Dept. of Biology, Mount Mercy College, Pittsburgh
- Rhode Island: Brown University
- Dr. J. W. Kling, Dept. of Psychology, Brown University, Providence
- South Carolina: South Carolina Academy of Science
- Dr. Richard H. Gadsden, Asst. Prof. of Chemistry, Medical College of South Carolina, Charleston
- South Dakota: South Dakota State College
- Mr. Kenneth E. Howard, Asst. Prof. of Chemistry, South Dakota State College, Brookings

Tennessee: Tennessee Academy of Science
Mr. James I. Major, Chemistry and Physics Teacher, Clarksville H. S., Clarksville
Texas: Texas Academy of Science
Mr. Jack Pemberton, Chm., Texas Jr. Academy of Science, La Porte H. S., La Porte
Utah: Utah Academy of Sciences, Arts and Letters
Dr. Richard S. Peterson, State Supv. of Science, Utah State Capitol Bldg., Salt Lake City
Vermont: University of Vermont
Dr. G. Chapman Crooks, Prof. of Chemistry, University of Vermont, Burlington
Virginia: Virginia Academy of Science
Mr. J. C. Holmes, Research and Development Dept., Philip Morris, Inc., P. O. Box 1895,
Washington: Whitworth College, Richmond
Dr. Hugh W. Johnston, Chm., Dept. of Chemistry, Whitworth College, Spokane
West Virginia: West Virginia Academy of Science
Mr. Douglas B. Williamson, Asst. Prof. of Physics, West Virginia University, Morgantown
Wisconsin: Wisconsin Academy of Science
To be announced

*Washington Trip Winners
of the*

*Twentieth Annual Science Talent Search®
for the Westinghouse Science Scholarships and Awards*

Bernstein, Herbert Jacob 16 New Utrecht H. S. 1342 51st St. 19
Gordon, Robert Jay 16 Yeshiva of Flatbush H. S. 2480 84th St. 14
*Fell, Harriet Jane 16 Jamaica H. S. 75-32 179th St., Flushing 66
Wallman, Joshua 17 Bronx H. S. of Science 23 E. 69th St. 21
Lopowsky, James Ivan 16 Stuyvesant H. S. 143-11 Barclay Ave.,
Flushing 55
Penfield Tate, William Charles 17 Penfield Central H. S. 11 Dogwood Glen,
Rochester 25
Staten Island Rappaport, Bernard Sandor 17 New Dorp H. S. 72 Tenth St. 6

OHIO

Cleveland *Manak, Rita Carol 16 Lourdes Academy 2217 Montclair Av. 9
Fairborn *Mayer, Ann 17 Fairborn H. S. 572 Wayne Dr. 7
Tipp City Smith, Dale Thorp, Jr. 18 Tippecanoe H. S. 7276 S. Dixie Dr.

OREGON

Beaverton Hubbell, Wayne Lester 17 Beaverton H. S. 4450 S. W. 96th St.

TEXAS

Austin *Matsen, Frederick Albert III 16 Stephen F. Austin H. S. 1800 San Gabriel St. 1
Fort Worth *Harkins, Anna Marie 17 Arlington Heights H. S. 4010 W. Fourth St. 7

VIRGINIA

Arlington Jones, Edward Charles 17 Wakefield H. S. 6807 N. 29th St. 13

* indicates first
H. S. indicates High School
HOME ADDRESS follows name of school
AGE of winner follows name



SCIENCE SERVICE - 1719 N Street, N. W. - Washington 6, D. C.

The forty Washington trip winners of the 20th Annual Science Talent Search, among whom \$34,250 of Westinghouse Science Scholarships and Awards will be distributed, represent about 1% of those who completed entries in this scientific and educational competition.

Designed to discover and develop scientific ability among high school seniors, the Science Talent Search is conducted annually for the Westinghouse Science Scholarships and Awards by Science Clubs of America, administered by Science Service, 1719 N Street, N.W., Washington 6, D. C.

Nine girls and 31 boys (proportion determined by ratio of boys and girls completing entries) are being invited to Washington, D. C., for an all-expense trip March 2 through March 6, 1961, to attend the Science Talent Institute. Here five winners will be selected by the board of judges to receive one of the following Westinghouse Science Scholarships: \$7,500 (\$1,875 a year), \$6,000 (\$1,500 a year), \$5,000 (\$1,250 a year), \$4,000 (\$1,000 a year), \$3,000 (\$750 a year). The remaining 35 contestants will be given Westinghouse Science Awards of \$250 each.

The trip winners are 15 to 18 years of age and come from 30 cities in 18 states and the District of Columbia. They were picked by the judges from among 25,355 contestants of whom 3,991 completed their entries by taking a science aptitude examination, obtaining recommendations and writing a report on "My Scientific Project." Examinations were received from every state.

Of the 40 Twentieth Annual Science Talent Search winners, 27 ranked in the top 5% of their graduating class and 18 of these were first, second or third. Most of the winners are members of science clubs and many of them are club presidents or other officers. Most of their clubs are affiliated with Science Clubs of America. Girls accounted for 23.2% of the entries this year.

Washington Trip Winners

ARIZONA

Phoenix Fox, Donald Jensen 17 West H. S. 2314 W. Pinchot St.

COLORADO

Denver Chesson, Douglas Howell 17 East H. S. 6301 E. 22nd Ave. 7

DISTRICT OF COLUMBIA

Washington Newlon, Michael Clarke 17 Western H. S. 3714 Massachusetts Ave. 16

FLORIDA

Coral Gables *Melson, Eloise Ann 17 Coral Gables Sr. H. S. 1507 S. W. 19th Terrace, Miami 45

Melbourne Adkins, William Milton III 17 Melbourne H. S. 67 Lund Circle

GEORGIA

Atlanta Kane, Daniel Frederick, Jr. 17 Joseph E. Brown H. S. 1626 Rogers Ave., S. W. 10

Atlanta Hosford, James Michael 17 Northside H. S. 1080 Northcliffe Dr., N. W. 18

IDAHO

Idaho Falls Wheeler, John Craig 17 Idaho Falls H. S. 239 11th St.

ILLINOIS

Chicago Dworkin, Barry Ronald 16 Anundson Sr. H. S. 2630 W. Rascher St. 25

Evanston Axelrod, Robert Marshall 17 Evanston Twp. H. S. 8835 Monticello Ave., Skokie

Highland Park McGovern, Thomas John 17 Highland Park H. S. 347 Elm Pl.

LaGrange Phillips, Roger Morgan 16 Lyons Twp. H. S. 5434 Grand Ave., Western Springs

INDIANA

South Bend Peters, Roger Paul, Jr. 17 Central H. S. 557 Edgewater Dr.

Raymond, Robert Lee 17 Central H. S. 1205 N. Kaley 28

IOWA

Cedar Falls *Wilson, Mary Sue 17 Malcolm Price Laboratory School 1203 W. 23rd St.

KENTUCKY

Louisville Kleinman, Daniel Ellis 17 Atherton H. S. 1414 Goddard Ave. 4

MARYLAND

Bladensburg Andrews, Thomas Gaylor, Jr. 17 Bladensburg Sr. H. S. 5903 Euclid St., Cheverly

*Kotke, Margaret Ellen 17 Bladensburg Sr. H. S. 3209 Tremont Ave., Cheverly

MASSACHUSETTS

Quincy Hoffman, Donald Richard 17 North Quincy H. S. 80 Forbes Hill Rd., Wollaston 70

Revere *Cecere, Mary Ann 17 Revere H. S. 300 Malden St. 51

MISSOURI

Kansas City Bartsas, Bernard George, Jr. 15 Southeast H. S. 6319 S. Benton St. 32

NEBRASKA

Omaha Josephson, Paul Douglas 17 Omaha Central H. S. 1507 N. 54th St. 4

NEW YORK

Brooklyn Alben, Richard Samuel 16 Erasmus Hall H. S. 213 Aldermarke Rd. 18

*Kaufman, Laura Sue 16 Erasmus Hall H. S. 45 Hawthorne St. 25

Lesk, Michael Edward 15 Erasmus Hall H. S. 225 Marlborough Rd. 26

Rohman, William David 16 Erasmus Hall H. S. 297 Lenox Rd. 26