• research involving observation of public behavior, which is also subject to privacy rights and
• research using existing data or documents when publicly available or when subjects cannot be identified.

In addition, research involving surveys of or interviews with elected or appointed public officials or candidates for public office will be exempted. And an "expedited review" will be established for low-risk medical research.

The strength of the new rules, according to Charles McCarthy of the National Institutes of Health, is that they no longer require review boards to examine nonfunded and low-risk behavioral projects. Many of these projects are done by students and professors on a small, nonfunded scale. □

National Geographic focuses on energy

The energy crisis — its causes, its repercussions and attempts being made to cope with it — has been captured in a special bonus February issue of NATIONAL GEOGRAPHIC magazine. Carrying no advertising, the 118-page issue represents a year's efforts by the staff to assemble a colorful, panoramic primer outlining where wasteful consumption patterns are leading the world's energy consumers.

A 12-page atlas illustrates U.S. oil, coal, natural gas, geothermal, nuclear and solar energy resources in a splash of lucid maps, graphs and charts. Not only do they highlight the nation's resource potential in these critical areas, but also the attendant political and environmental problems expected to develop with their increased exploitation. Technical concepts are pictured in diagrams and photos accompanying articles packed with statistics. But in each case, authors focus on the human dimension of the energy picture, especially how "Yankee ingenuity" is being harnessed to develop practical solutions (such as burning walnut shells and installing a new breed of composting toilets) to the problem.

During their research, the magazine's editors found "conservation and increased efficiency offer the only reasonable immediate relief." New fuels, such as synthetic substitutes for crude oil, will probably play a major role in the future, but won't make their dominent impact until well into the late 1980s or 1990s. "We are looking at a once-in-a-lifetime phenomenon — the creation of a major new industry on the scale of the railroads and aerospace," explains an Exxon Co. vice president in his assessment of what's ahead for synfuels. And what about that American dream of self-sufficiency? "[It] will require more concerted effort than our entire moon program," concludes editor Wilbur Garrett. □

The top 40 of the Science Talent Search

The U.S.S. Enterprise is locked in cosmic conflict with an enemy starship. Spock, Scotty and the gang are all there to assist in choosing a defensive command. Should the crew fire torpedoes or phasers? Should they try to evade the enemy? Suddenly, enemy fire damages the defensive shields of the Enterprise. The ship is now running low on energy so the crew must engage Automatic Helm Control and plot a course to one of the starbases.

Although it sounds like a "Star Trek" rerun, this galactic scenario is a situation that might be encountered playing STARSHIP, a complex computer game designed by high school student John Scott Penberthy of Midlothian, Va. While a number of Star Trek computer games exist, STARSHIP is more complex and just as rapid, allowing two to nine players to communicate with each other in an elaborate game of interstellar warfare and requiring only about three to six seconds to respond to commands. Such a program could have applications in science and business information systems.

Now Penberthy has the opportunity to bring this computer program to Washington: He is among the 40 chosen as winners in the 40th Annual Science Talent Search. On Feb. 26, the six female and 34 male high school students — judged tops among 993 completely qualified entrants — will begin a five-day Science Talent Institute session, which will include a display of their projects at the National Academy of Sciences. In addition, $89,500 in Westinghouse Science Scholarships and Awards will be presented.

The session features projects in scientific disciplines such as medicine, physics, engineering, biochemistry and astronomy. The math category, for example, includes six entrants this year. Entrant Tan Dinh Ngo probably best took advantage of the universal language of mathematics: Ngo is a Vietnamese refugee who has been living in New York less than two years. For his Science Talent Search project, he developed and tackled a mathematical problem similar to one posed by mathematician Paul Erdos nearly 40 years ago.

While some of the contestants spent their grueling hours of research at a desk, in a basement or at a hospital facility, the outdoors was one student's laboratory. Forrest Lincoln Piehl of Keyser, W. Va., selected his science project while hiking one day near his home. There he noticed fresh "blazes" — tree wounds caused by deer antlers. Piehl's project involved determining which species of trees most often fall prey to blazing. The results of this Science Talent Search project could improve deer management procedures to prevent timber loss.

The Science Talent Search, which is conducted by Science Service, is the oldest and largest high school science scholarship program in the United States. Past winners include four who went on to win Nobel Prizes — including 1949 Science Talent Search winner Walter Gilbert of Harvard University who shared the 1980 Nobel Prize in chemistry. This year's winners come from 37 schools in 14 states.

This year's 40 winners are:

ALABAMA: *William Shelton Chitwood,* Lawrence County H.S., Moulton.

CALIFORNIA: *Stephen Wong Lim,* Alhambra H.S., Alhambra; *Joan Inyul Chu,* Acalanes H.S., Lafayette; *Daniel Shenon Briggs,* Tamalpais Union H.S., Mill Valley; *William Ko,* San Marino H.S., San Marino.

CONNECTICUT: *Michael Morgan Dowling,* Newington H.S., Newington.

FLORIDA: *Eduardo Antonio Garcia,* Christopher Columbus H.S., Miami; *Song Tan,* Southwest Miami H.S., Miami; *Douglas Anthony Simons,* Vero Beach H.S., Vero Beach.

ILLINOIS: *Randall Todd Hayden,* Whitney M. Young H.S., Chicago; *Wendy Eileen Soll,* Evanston Twp. H.S., Evanston.

MARYLAND: *Jin-Moo Lee,* Friendly Sr. H.S., Oxon Hill.

NEBRASKA: *John Marion Geppert,* Creighton Preparatory School, Omaha.

NEW JERSEY: *Regina Lee Sohn,* Parsippany Hills H.S., Parsippany; *Ezekiel Michael Leventhal,* Waldwick H.S., Waldwick.

NEW YORK: *Mara Mae Gross,* Baldwin Sr. H.S., Baldwin; *Bruce David Binderow,* Benjamin N. Cardozo H.S., Bayside; *Michael Richard Candan,* Benjamin N. Cardozo H.S., Bayside; *Tan Dinh Ngo,* John F. Kennedy H.S., Bronx; *Marc Adam Turkel,* Riverdale Country School, Bronx; *Charles Curtiss Mancuso,* Nichols School, Buffalo; *Mark Lewis Movsesian,* Forest Hills H.S., Forest Hills; *Lori Ellen Kaplowitz,* George W. Hewlett H.S., Hewlett; *Michael Philip Lisanti,* Hillcrest H.S., Jamaica; *Martin Bruce Miller,* Jamaica H.S., Jamaica; *William I-Wei Chang,* Bronx H.S. of Science, New York; *Seth Steven Finkelstein,* Bronx H.S. of Science, New York; *Daniel Y. D. Yu,* Bronx H.S. of Science, New York; *Terence David Sanger,* The Dalton School, New York; *Amy Sue Reichel,* Hunter College H.S., New York; *Joel Martin Wein,* Stuyvesant H.S., New York; *Thomas Orren Patterson,* Roy C. Ketcham H.S., Wappingers Falls.

TEXAS: *Jeffrey Roser Smith,* Skyline H.S., Dallas; *Edward George,* Coronado H.S., El Paso; *Garrett Trent Biehle,* Westchester Sr. H.S., Houston.

VIRGINIA: *John Scott Penberthy,* Midlothian H.S., Midlothian; *Michael Frank Reidy,* West Springfield H.S., Springfield.

WASHINGTON: *Bryan Douglas Henderson,* Timberline H.S., Lacey.

WEST VIRGINIA: *Forrest Lincoln Piehl,* Keyser H.S., Keyser.

WISCONSIN: *Jonathan Eric Fliegel,* James Madison Memorial H.S., Madison. □