

miral Rickover is sure he can build if he can find the money. The Joint Committee may ask the Atomic Energy Commission to pick up the tab.

The U.S. now has 74 nuclear submarines in operation, compared with about 55 for the Soviet Union. Of the U.S. subs, 41 are Polaris launchers, and 33 are attack subs. In addition, the U.S. has 72 diesel powered submarines, more than 60 built during World War II.

"We have no superiority in numbers," says Admiral Rickover. "We should be concerned over the situation that will obtain just a few years from now."

Surface vessels are farther from the sensitive area of nuclear deterrent. Although the greater range and flexibility



Navy

*Attack sub has deterrent role.*

of nuclear powered ships is beyond question, it has been possible for Defense Department analysts to argue that lower-cost conventional ships in greater numbers can fill the role of limited warfare that today's navy plays.

Only by bringing in the threat of Russian submarines to oil supply lines can the nuclear surface ships be justified.

The Defense Department clearly doesn't want to consider that a likely prospect, since it implies full-scale war with the Soviet Union, which would mean the failure of the deterrent.

But Admiral Rickover insists that building ships without regard to defending them is a foolish plan. He claims the navy's experience off Vietnam is a kind of "War College exercise" in which the U.S. is operating on the basis of immunity from losses.

"It might ultimately be a wholesome lesson," he told the Joint Committee, if a U.S. ship were sunk by an enemy submarine off Vietnam.

## HEART TRANSPLANT

### Not therapy but experiment

Heart transplantation in man cannot be regarded as therapy, not even in extreme cases when all other courses of action appear blocked. This is the conclusion of the Board on Medicine of the National Academy of Sciences, which last week released a policy statement on human heart transplants. The board is only one of many private and public groups seeking to come to grips with the ethical questions raised by transplants.

"The procedure must be viewed clearly for what it is, a scientific exploration of the unknown," it says.

The statement declares that because surgery is only part of the experiment, which should be followed with rigorous scientific study, there must exist many more surgical teams capable of the surgery than there are capable of both surgery and study. Because of this the board suggests that before cardiac transplantation is attempted, the following criteria be met:

- The surgical team should have "extensive laboratory experience" with animal heart transplants. It should demonstrate not only surgical competence but complete understanding of the process of immunologic rejection of the organ and control of this process. In addition specialists should be available as collaborators.

- "As in any other scientific investigation," there should be an advance plan of study recorded. Arrangements should be made for systematic observations of the patient throughout his lifetime. There should be an organized communication network so the latest results of the investigation would be generally available.

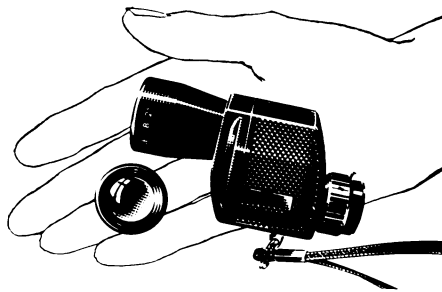
- Because the procedure is experimental, the primary justification for a heart transplant attempt should be that it will yield new beneficial knowledge.

- Selection of donors and recipients should be subject to rigid ethical and medical safeguards. Independent panels of "expert, mature physicians" not involved with the transplant group should select donor and recipient by unanimous, recorded decision.

The board's criteria are based on the conviction that for progress in heart transplantation "only a relatively small number of careful investigations" are presently required.

The statement did not suggest that any of the six transplant operations so far performed have failed to meet its criteria. However, as recently as last February the Surgeon General of the Public Health Service had to order that all institutions receiving its grants must set up review panels.

## Hold The World In Your Palm..with



### M. V. MINISCOPE SYSTEM \$16.95

So startlingly different are the design and performance of the M.V. MINISCOPE SYSTEM that you won't really believe it until you see it and use it yourself. ■ With its standard objective the M.V. is an 8x, wide-angle (8.2°), 24mm monocular telescope—more powerful than most field glasses and binoculars. For an even larger field, just quick-change objectives and you have a 5x, super-wide-angle (11°), 18mm telescope. ■ The prismatic, fully coated optics are of the same uncompromising quality that you expect from the finest Japanese cameras—crispness, brilliance and complete planarity. ■ As an added bonus, the objectives may be used as 3x and 5x wide-field magnifier/loupes, of unexcelled definition and clarity. ■ Weight 3¼ ozs., length only 3½". Comes with handstrap and soft, flat, zippered case that fits snugly in gentleman's pocket or lady's purse.

Send the MIYAUCHI M.V. MINISCOPE SYSTEM w/case & exchange objectives. Satisfaction, or refund guaranteed. Check for \$16.95 plus \$1 for post. & ins. encl. (Calif. resid. add 5% tax.)

Name \_\_\_\_\_

Address \_\_\_\_\_

Zip \_\_\_\_\_

584 Washington St.,  
San Francisco, 94111

SN 0309

(415) 981-5688

**haverhill's**

## Share the Thrills of Exploring Outer Space!



\$194.95

All DYNASCOPES, including this superb RV-6, 6-inch available on easy terms!

Now it's easy to join the thousands of serious amateurs who have discovered the excitement of exploring our mysterious universe. Your enjoyment begins right from the start, yet the challenges and rewards go on for years! And it's a hobby that can be shared at modest cost.

Choose from a Full Range of DYNASCOPES® 4" Starting at \$49.95

Picking a telescope to fit your needs and your pocketbook is simple when you select a DYNASCOPE—the same instruments used by more than 150 schools, colleges and observatories. Prices begin as low as \$49.95, and your satisfaction is guaranteed by a full-refund warranty.

FASCINATING GUIDE YOURS FREE!

Read these valuable facts before buying any telescope. Mail coupon or postcard for your complimentary copy of this helpful guide.



Criterion Manufacturing Co.  
331 Church St., Hartford, Conn. 06101  
© TM Registered U.S. Pat. Office

CRITERION MANUFACTURING CO., Dept. NL-18  
331 Church St., Hartford, Conn. 06101

Please send your free Telescope Guide.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

9 march 1968/vol. 93/science news/233