

★ ★ ★ ★ ★
ACCUStar ★ ★ ★



**ASTRONOMY'S
NEW TOOL**

★
**A
QUALITY
PRODUCT
FOR YEARS
OF USE**

AT LAST SIDEREAL TIME ANYWHERE
Adjustable to date, time, longitude, latitude and every cycle of change. Hour by hour, day by day, year by year.

MANY IMPORTANT AND INTERESTING THINGS CAN NOW BE DONE WITH GREATER ACCURACY THAN EVER BEFORE.

BOOK "FIND THE STARS"
(90 pages - 8½"x11") with constellation maps and data on hundreds of celestial objects. Explains and illustrates time, motion and many uses for ACCUSTAR. Gives the long sought answer to the main problem of an amateur with a telescope.

INDISPENSABLE FOR TEACHERS, STUDENTS OR PROFESSIONALS.

SCHOOLS: for information under Title III, Aid to Education, write: Schoolmasters Science, 745 State Circle, Ann Arbor, Mich. 48104.

Complete Unit:
Book
and
Instrument

\$9⁹⁵

ACCUStar INC. ★ ★ ★

P. O. BOX 4712 • DETROIT, MICH. 48219

FROM JAPAN

Brain Drain Touches Lightly

Like Western Europe, Japan suffers a brain drain, largely to the United States. But with research and industry plagued by a serious labor shortage, and with Japan in unprecedented prosperity, this "drain" is at least now partially contained.

Japanese industry, reaping vast profits, is spending more on its scientists and technicians. With biannual bonuses, increased take-home pay, and other fringe benefits inherent in Japan's still-paternalistic company system, it offers solid reasons for Japanese to stay home.

Too, laboratory facilities have been vastly improved, and more firms are allotting more funds to research and development projects that attract scientists' attention. The average major company is spending three to five percent of gross sales on R&D.

Overall, Japanese riding both affluence and a new, strong nationalism, are anxious to keep their nation technologically in the forefront in shipbuilding, steelmaking, electronics, cameras, optical goods, plastics, medical electronics and high-grade textiles. They want to close the gap where industry still lags, but has a chance of climbing toward world position, as with automobiles, machinery, petrochemicals and machine tools.

This nationalism is an emotional brake on a brain drain, even in the face of attractive foreign beguilements.

Nonetheless the lure from abroad has steadily drawn off, primarily to the U.S., a large number of eminent Japanese scientists.

This is not a serious exodus. Most Japanese who go on fellowships, scholarships, foundation and exchange grants to the States return. It is unofficially estimated that between 12 and 15 percent remain abroad though, after their stays officially end.

The chief exodus has been in the medical field, where Japan admittedly lags, and the bulk of these specialists have been in such fields as cancer research, brain and heart surgery, pediatrics, psychiatry, biochemistry, cellular chemistry and serology.

Some prominent scientists have gone abroad and indicate no intent to return to Japan, such as Dr. Leona Ezaki, inventor of the tunnel diode, now of Massachusetts Institute of Technology, Tokyo University's Dr. Kenkichi Iwazawa, now teaching mathematics at MIT; Dr. Shizuo Kakutani, who worked at the Institute for Advanced Study, Princeton, N.J., and who now teaches at Yale.

Others, however, like Drs. Hideki Yukawa and Shinichiro Tomonaga, both Nobel Prize winners in physics, have studied abroad, and returned.

Increasing numbers of engineers and scientists are engaged in industrial research in dozens of industries. Over 30,000 are listed as research employes of big firms, another 7,500 as working in government and university laboratories in industrial research. Major concerns are now employing high school-trained technicians in skilled categories, so short is the labor supply.

One large company personnel manager succinctly phrased it: "We will hire, and have hired, any warm body with the power of speech and the ability to sign a contract."

In recent years, Japanese industry has spent well over \$250 million a year in research with 65 percent of it directed toward such "growth" industries as electronics, chemicals, petrochemicals, synthetic fibers, aviation and nucleonics. This is 25 percent more than the 1960 investment, and 100 percent more than in 1955.

Since World War II, Japan, isolated, decimated and realizing its underdevelopment, has tried desperately to catch up with the scientific-industrial progress of the West. Well over 1,875 patent licensing and cross-licensing agreements have been sanctioned by the Government, once very conscious of foreign exchange reserves, and still fearful of direct foreign capital encroachments.

The total industrial research effort in Japan is still very small when compared with the \$18 billion to \$20 billion which U.S. industry will similarly disburse in 1967. While big firms spend more on R&D—3 to 5 percent, when 10 years ago it was 0.5 to 1 percent, the many small and mediumsized enterprises have neither the capital to back extensive research, nor the imagination or the desire.

Wage levels of Japanese scientists, while rising, especially when fringe benefits are added on, are still roughly one-fifth to one-eighth of those of their counterparts in the U.S. and Western Europe.

The higher salaries, the still-superior laboratory facilities, the prospect of working with world-rank brains, still generate an excitement in qualified Japanese to go abroad, and to remain.

Increasing numbers of Japanese concerns walk a two-way street. They buy foreign techniques and sell patent rights on their own techniques to firms abroad. Some fortunate ones have revealed that the added expenditure for research is being "more than paid for" by royalties from the U.S. and Western Europe.

Fortunately Japan has yet to find



\$194⁹⁵

Share the Thrills of Exploring Outer Space!

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-4
331 Church St., Hartford, Conn. 06101

Please send your free Telescope Guide.

Name _____
Address _____
City _____ State _____

any true local linkup between the brain drain, the technology gap and nuclear technology. To be sure, the Tokyo Government, more for political than for scientific reasons, has major reservations, toward the envisioned atomic non-proliferation treaty, which might, potentially, deprive this workshop nation of capability in nonmilitary nuclear-technology areas.

Although Japan is in embryonic stage in this industry of the future, it is laying solid careful plans, and has reactors in operation, others building, and ample plans to ensure adequate nuclear fuel.

Japanese are not yet in active demand for nuclear industry overseas, and thus are free, for the time being, to concentrate on progress in this country. But the time will come when advances in this field parallel Japanese progress in less difficult fields of industry. Then the foreign university, the overseas agency, the alien institute, and the foundation abroad will seek, and be willing to pay, for Japanese talent.

At that time, too, Japan might be in a position, far more than it is today, to want to hold its own nuclear savants here at home. For by that time, with nuclear weapon proliferation, Japan which even now has the technology, the funds, and the personnel to build a bomb, might feel it had to do so to ensure the nation's sovereignty. Then, any brain drain would be damaging. But not yet.

What can Japan do to halt such brain drain as there is? "In Japan," says famed Dr. Kentaro Yano of the Tokyo Institute of Technology, "a young assistant can never hope for promotion to a professorship no matter how talented he is, how brilliant his achievements. In contrast, such a person would be invited to be a full-fledged professor at an American university, and treated as such regardless of his age, family and connections."

In Japan, too, the young scientist faces this handicap—his hard work, his accomplishments are preempted by the department head, an older man with full seniority, and then presented in public not as the work of the young man, but of the old.

Stuart Griffin

FROM SWITZERLAND

World Health: Bad

Dr. Marcolino Gomes Candau, director general of the United Nations World Health Organization in Geneva, says "massive assistance is urgently needed" if the yawning gap between the rich and poor countries is not to cause catastrophe.

He prepared his annual report for the 20th World Health Assembly now

running near the rooms occupied by the non-proliferation treaty delegates (SN:5/13) and the Kennedy Round trade tariff negotiators.

The 56-year-old Brazilian, trained in Rio and at Johns Hopkins University, took the job in 1953. He coordinates the efforts of 1,500 people in the new headquarters building and hundreds of other doctors and workers in 127 nations and territories.

Dr. Candau blames the health gap for the failure thus far of many outstanding international health and medical campaigns.

"The same two factors that impair general national development cast their shadows on public health," he declares. "These are the inability or unwillingness of the more fortunate countries to adjust their aid to the real need of developing countries, on the one hand. On the other, political instability, administrative inefficiency and lack of planning and personnel, emasculate much of the aid that is given."

Contributors to WHO	Budget
United States	31.20%
Soviet Union	13.30%
Canada	7.83%
West Germany	6.61%
United Kingdom	6.43%
France	5.43%
Taiwan	3.79%
Japan	2.47%
Italy	2.26%

(His first reference, informed observers point out, is not so much to the U.S., which pays 31 percent of all WHO dues and must avoid the embarrassment of more open contributions by informal gifts, nor to the Soviets, who pay 13 percent. Some Western European countries, professionals feel, could do more than they are doing.)

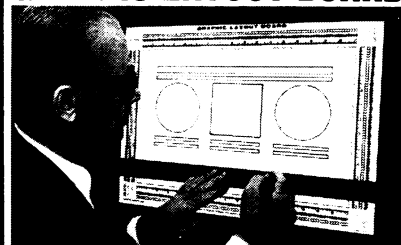
The UN agency made "disappointingly little headway" last year in such major programs as the long-standing malaria eradication effort. Many African states are still hardly started and some Asian countries that had done well are slipping back.

"So long as many countries do not have their own qualified professional personnel, international assistance will not achieve its objective and even the most carefully planned and carried out projects will not justify the sacrifice of men and material," Dr. Candau warns.

WHO supported 1,276 projects in 52 nations last year. Large amounts of external aid are especially needed by Africa, where there were 174 projects in 35 countries below the Sahara. The emphasis is on communicable or infectious diseases: malaria and small-

(See page 483)

GRAPHIC LAYOUT BOARD



You Make Layouts Faster

You cut most layout work in half with these New time saving forms. Scales printed on edges of your layout save you measuring time. For office forms, charts, drawings, catalogs, ads, brochures and other uses. You do not need T-square to lineup your work. Come in several sizes and weights to meet your requirements.

FREE Illustrated BROCHURE L2
Mailed Without Obligation

GRAPHIC SYSTEMS, Box 398, Yanceyville, N.C.

CHEMISTRY INSTRUCTORS

The Recht Chem-Formulator is not a crutch but a valuable learning aid for students. For science clubs, libraries or student councils it may also be a means of making money.

This Chemistry Wheel shows:

Properties of Elements
Inorganic Compounds
Writing of Inorganic Formulas
Balancing Metathesis & Replacement Equations

Priced from 75¢ a single copy
down to 36¢ each for 25 or more.

RECHT CHEM-FORMULATOR CO.

P.O. Box 225 • Boulder, Colorado 80302

BOOK ORDER SERVICE

For the convenient purchase of any U.S. book in print you may avail yourself of Science News Book Order Service, 1719 N St., N.W., Washington, D.C. 20036. We pay postage. 25¢ handling charge if price is less than \$2.00. Regular retail prices on all books.



Fool your friends! Mystify your classmates!

This Density Rod floats in hot water—sinks in cold, or identical one that sinks in hot water and floats in cold water.

Metal cylinder 13 mm diam., 85 mm long. Used to demonstrate the differences in density of water at high and low temperatures.

\$2.25 each or
2 for \$4.00 Postpaid

Experiments in Electrostatics—a book of experiments you can do . . . send 50¢. Low priced physics equipment for schools and science projects.

Free catalogs—send 15¢ for postage.

MORRIS and LEE

Dept. SN-5B67, 1685 Elmwood Ave., Buffalo, N.Y. 14207