

Cancer Research On Many Fronts

It took seven separate locations widely scattered through the city of Nagaya to accommodate the Seventeenth General Assembly of the Japan Medical Congress last month. In all, 35,000 Japanese doctors and a handful of foreign specialists showed up for what may have been one of the world's largest and busiest scientific conferences.

When the smoke cleared, among the pictures emerging was one of solid progress, though no hypothetical cures, on a broad spectrum of cancer research, ranging from chemotherapy and surgery to instrumentation, photography and microorganisms, including:

IMMUNOLOGY

Antigen Trigger

An attempt to break the body's immunotolerance to tumor cells was reported by Tokyo University pharmacology professor Dr. Denichi Mizuno.

Dr. Mizuno worked with a polysaccharide isolated from the bacterium *Proteus vulgaris*, and found it effective against several cancers in mice, "with few, only very temporary side effects."

The mechanism of the saccharide's cancer-arresting ability, he reports, is the stimulation of the reticuloendothelial—the system charged with recognition and destruction of foreign bodies.

If the RES can be activated to detect and identify cancer cells as an enemy, which it does not always do naturally (SN:4/1), the body's defensive mechanisms can be triggered.

"We believe," he says, "the injection of antigens will open a new avenue of approach to immunotolerance."

BIOCHEMISTRY

Virus-like Organism

Prof. Fusahiro Ikura of the Cerebral Research Institute, Niigata University Medical Department, is examining a mysterious microorganism resembling a kind of virus. It was discovered when he and an American—Dr. H. H. Zimmerman of Montefiore Hospital, New York—were jointly investigating the cause of human cancer in 1960-66.

"Some kinds of virus are known to cause cancer among experimental animals," he explained. But a big problem is whether human cancer is attributable to the viral action or to some

inorganic cancer-causing material.

Dr. Ikura injected brains, muscles, and skins of thousands of mice with various chemical substances known to cause cancer, and always observed by electron microscope "virus-like slender microorganisms present near where the cancer-causing substances had been injected a month after injection, regardless of the kind of substance or location of the injection.

"When cancer began to develop," he continues, "the microorganisms were invariably found to disappear. The strange stick-like objects each contained RNA (ribonucleic acid)."

His studies, if successful, may tell how to prevent the growth of, or remove such microorganisms to control cancer development, as well as identify a possible cause of the cancer. He is yet to isolate completely the microorganisms by a chemical process or confirm that when planted in animals, they reproduce and give rise to cancer.

BACTERIOLOGY

Erysipelas Theory

Hemolytic streptococci, pathogens of such infectious diseases as erysipelas and blood poisoning, have "high cancer control efficiency," says Prof. Hajime Okamoto, bacteriologist at Kanazawa University Medical School. In animal experiments, he found that hemolytic streptococci injection "has arrested growth of almost all types of cancer and proved incomparably more effective than any other chemical substance in arresting such growth."

Whether the erysipelas can cure cancer, as old wives' tales have suggested for more than a century, is still far from settled. But the Okamoto group apparently has determined that, as the bacteriologist reports, "hemolytic streptococci enter the cancer cells by breaking through cell walls.

"They expel the nucleic acid, the most important part of a cancerous cell, and then destroy the cancerous growth."

CELL MOBILITY

Transmission

Movements of cancer cells in blood vessels have been filmed by Dr. Haruo Sato of the Acid-Fast Bacteriology Research Institute at Tohoku University in Sendai. The scientist reported that cancer cells manage to squeeze themselves into capillary vessels smaller than they are. This new phase of the ecology of cancer cells was brought to light when researchers first anesthetized a rat, opened the abdomen, and took out the lining. Then they at-

tached the camera to a microscope and injected cancer cells into the carotid, a neck artery, of the rat. The cells went down the carotid and, gradually advancing, squeezed into capillary vessels smaller than themselves by conforming to their shapes. Dr. Sato noted that a cancer cell 20 microns in diameter can go into a vessel seven microns in diameter; in this way cancer cells circulate through the blood and lymphatic vessels throughout the body.

SURGERY

Peeling Technique

Osaka Medical University surgeons Naohike Harada and Takamitsu Kusunoki described surgery using a new "peeling technique" in bladder cancers. They claimed the chance of cancer return is "extremely low" and added that "any new tumor spots, post-operatively, can easily be detected and excised."

Surgery affects mucosal denudation of the bladder, with no side effects, disclosed clinically in over 40 cases. Normal mucosa grows back within a month's time. Only three of these bladder cancer patients suffered recurrences.

The new growths were found and surgically removed through a tube inserted into the bladder, with regrowth of the lining apparently not increasing the risk of "cancerous infiltration into the urinary bladder," as Dr. Harada explains. "It was notable that the site of the recurrence in the rare cases where such did occur was limited in the unstripped mucosa and not in the newly regenerated mucosal lining."

"Up to 60 percent of patients with low grade tumors can be treated by our technique, since their tumors have not extended into muscular tissue. Results are best if only part of the mucosa is removed and if the bladder is left intact," says Dr. Kusunoki.

FROM GHANA

Instant Fu-Fu For West Africa

A technological marriage between the yam and the instant mashed potato may soon solve one of West Africa's most important food storage problems.

The yam, one of West Africa's most widespread staples, is a large, bland relative of the sweet potato. For centuries, African women have cooked and pounded them in heavy wooden mortars until the starch congealed into a stiff dough of rubbery farina known as fu-fu. The sticky mass is molded into little balls with the fingers, dipped into a spicy soup and eaten.

Yams are one of the few food crops indigenous to Africa, and have played an important role in African culture for centuries. In many cultures, a man's wealth and importance in the community are measured largely by the size of his yam crop. The New Yam Festival is celebrated at the beginning of the harvest in almost all yam-growing parts of the West African coast from the Ivory Coast to the Cameroons.

As a staple, however, yams have many disadvantages. The price of yams per calorie is up to five times as high as other sources of carbohydrates, and the land and labor requirements for yam culture are roughly twice those for potatoes in temperate climates. Worst of all, the harvest of the deeply rooted yam tubers does not lend itself to mechanization.

In addition, yams must often be transported hundreds of miles in old trucks over bad roads, about 15 to 20 percent of the whole yam is inedible, and the edible portion is about two-thirds water. Finally, about 40 percent of the crop is customarily lost in storage.

Stored yams, particularly these damaged in transit, are subject to infestation by innumerable bacteria, fungi, insects, and nematode worms. Even in the absence of such infestations, ordinary cell respiration over seven or eight months of storage can reduce a large yam to a shadow of its former self. For all these reasons, yam prices in West African markets skyrocket during the three or four months before the new harvest in September.

For all of these reasons, yams are becoming less important in Trinidad, where they were long a staple. And they may eventually decline even in West Africa, where an increasing number of persons have neither the time nor the servants for the tedious process of making fu-fu.

A number of West African government and university laboratories are working on better means of yam storage. On the village level, the best way seems to be to store the tubers in shaded racks in the open with free circulation of air, a method which is traditional in large parts of the yam-growing zone. Since storage losses diminish rapidly with cooling, one answer may be centralized storage at temperatures slightly above 10 degrees C. the temperature at which irreversible chilling damage begins to take place. Such methods would be especially useful for export of yams to the West African communities in Great Britain and France.

The most satisfactory solution to West Africa's yam problem is instant fu-fu. At one stroke, this would reduce storage losses and transportation costs, and save much of the work of prepara-

tion. Food scientists at the University of Ghana and elsewhere have succeeded in modifying the American process for making instant mashed potatoes to produce palatable—but not yet marketable—fu-fu.

The African consumer of prepared foods is notoriously finicky, however, and food technologists are reluctant to market an instant product that does not yet reproduce exactly the taste and consistency of the original.

FROM SWITZERLAND

World Health Service Proposed by Ciba Head

The World Health Organization has been limping along on a \$50 million annual budget. It annually fights doggedly for increases from among its 127 nation-members. Soon, WHO may face competition from a hybrid, public-private organization designed to supplement the WHO assault on the perilous world health balance, but which would in fact take some of the wind out of WHO's sails.

Several developing nations, including Algeria, Iran and Yugoslavia have already expressed keen interest in a proposal made to health officials worldwide by Dr. G. E. W. Wolstenholme, director of the Ciba Foundation. In addition, Switzerland and Britain are described as "naturally" interested, and U.S. officials have expressed interest at least in seeing the subject pursued and discussed.

Dr. Wolstenholme contends that the health gap between the developing and the advanced nations has opened wider than the economic and technical gaps.

His answer is a World Health Service, which he describes as an expansion, rather than a duplication, of the health activities of WHO.

In fact, the WHS executive board as he foresees it would include WHO top doctors and officials of the two international Red Cross agencies in Geneva, plus other UN agencies and a host of private international associations and societies.

First task, Dr. Wolstenholme points out, is to assess the resources needed to carry out the work, in terms of men, money and materiel.

The Ciba doctor estimates that a minimal but telling contribution could be made by WHS on a budget of \$100 million a year—double the sum WHO has been able to extract from strictly public sources.

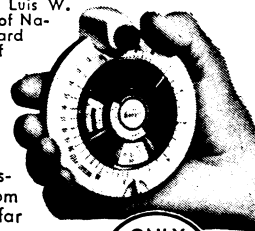
The first WHS professional teams would conduct pilot missions in catastrophic areas not only to save lives fast but to gain experience and to adapt to field conditions.

(More foreign news: p. 435)

Golfer, Yachtsman, Hunter, and Sportsman. . .

ORDCO RANGE FINDER

Conceived by Dr. Luis W. Alvarez, recipient of National Science Award and Inventor of G.C.A. Ground Control Approach.



Optical instrument ideal for golfers and yachtsmen. Measures distances from 6' to almost as far as the eye can see. Golfers use it to select right club — yachtsmen to plot precise chart position. Extremely useful to measure rough terrain. May even be used to measure variation in moon's distance in orbit around the earth. Simple to use. Direct reading in yards or miles.

ONLY \$18⁹⁰

-----INSTANT ORDER BLANK-----

Mail to: HAVERHILL'S SN 0506
526 Washington St.
San Francisco, Calif. 94111

Please send me the OrdcO Range Finder. Satisfaction or refund guaranteed.

I enclose \$18.90 plus \$1.00 for postage and insurance. (California residents add 4% sales tax.)

Bill AmExpr.

Acct. # _____

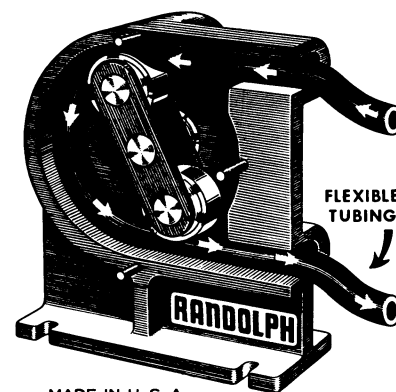
Name _____

Address _____

Zip _____

Haverhill's
Searching the World to bring you the Finest

The Pump That Never Gets Wet



MADE IN U. S. A.

RANDOLPH PUMP

FLUIDS FLOW THROUGH A FLEXIBLE TUBE WITHOUT CONTACTING THE PUMP CAPACITIES UP TO 200 GALLONS PER HOUR

Send For FREE Catalog

THE RANDOLPH COMPANY
1018 ROSINE ST. HOUSTON, TEX. 77019
Phone (Area Code 713) JACKSON 6-2091