

PUBLIC HEALTH

TB Can Be Eliminated Through Chemotherapy

➤ TUBERCULOSIS can be eliminated in the United States through drug treatment.

Dr. Edward T. Blomquist, chief of the tuberculosis branch, division of special health services, U. S. Public Health Service, called for coordination between public health agencies and communities to stamp out TB.

Eradication of tuberculosis means killing the tubercle bacilli in persons now suffering from the active disease and in those who previously had TB and were inadequately treated. The proper dosage of appropriate drugs, such as isoniazid, over a period of time will make it impossible to communicate the disease to others and will lessen the possibility of recurrence in the patient.

Because the death rate for tuberculosis has declined enough so that many TB hospitals have been closed, Dr. Blomquist said that the public has interpreted this situation as evidence that tuberculosis services in general can be cut back.

Public health departments are in difficulty on this account, but Dr. Blomquist said that intercounty cooperation enabling the State Health Department to work out a state plan for TB treatment might be a solution.

"The amount of direct service or financial assistance the state gives is not an issue," he said. "Any State Health Department should be able to serve in a coordinating capacity."

Dr. Blomquist's report appears in *Public Health Reports*, 75:1069, 1960.

• *Science News Letter*, 78:360 December 3, 1960

MEDICINE

Single Solution Replaces Fluids Lost After Burns

➤ A SINGLE SOLUTION can now be given intravenously to severely burned patients to replace water, salt and protein as they are lost. It is used during the first 48 hours following burns.

Drs. J. Frederick Eagle Jr. of St. Luke's Hospital, New York, and Worthington G. Schenck Jr., and Walton Shim of the Edward J. Meyer Memorial Hospital, Buffalo, report that this treatment has been used for all burn patients admitted to their hospitals during the past four to six years.

Replacement of red blood cells is also necessary, but seldom during the first 48 hours.

The solution contains 0.66% sodium chloride, two percent protein and five percent glucose.

Of 28 patients with burns of 15% or more of the body surface treated with the single solution, the physicians report that only one died during the early dangerous period following burn. This was their oldest patient, an 80-year-old woman with a 35% body burn who developed heart failure and pulmonary embolism the second day.

The doctors said the treatment did not

reduce the death rate as a number of patients died later, but reduced deaths during the first 48 hours.

The greatest asset of the treatment is that it simplifies care of burned patients. The single solution should be particularly valuable for use in disasters.

Four different solutions are usually given intravenously to severely burned patients. The single solution has the advantage of replacing blood substances at the same rate at which they are being lost.

The report appears in the *Journal of the American Medical Association*, 174:1589, 1960.

• *Science News Letter*, 78:360 December 3, 1960

IMMUNOLOGY

Live Parasite Vaccine Used in Cattle Disease

➤ A VACCINE made of weakened live parasites is being used in Great Britain to combat increasing parasitic infections in cattle. Irradiation of larvae by X-rays during the molting period weakens but does not kill the parasites.

Dr. Ernest J. L. Soulsby, University of Cambridge, England, said that a heavy dose of 60,000 roentgen units was used to weaken the larvae so that a live parasite vaccine could be made.

The tiny larvae are like minute worms, a third of a millimeter in length and one-fiftieth of a millimeter across. They are collected from the excreta of infected cattle, then irradiated before being put into vaccine that is injected into healthy cattle to prevent infestation.

The vaccine is expensive, Dr. Soulsby said, but a single shot, double strength, is effective. It costs the equivalent of about \$3.50 in U. S. money.

Parasitic bronchitis is especially prevalent among English cattle. This sets up an irritation leading to pneumonia and secondary infections that may be fatal.

Although it is possible to work only with animals at present on parasitic immunology, Dr. Soulsby said that not too far in the future it would have application for human beings.

In an interview preceding his lecture in Washington, D. C., which was under the auspices of the American Institute of Biological Sciences, Dr. Soulsby said there are common parasitic cross-overs between cats, dogs and humans.

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TECHNOLOGY

Electron Tube Speeds News Picture Printing

➤ A NEW ELECTRON TUBE can print three quality photographs a second from electronic signals sent over telephone or telegraph lines. The machines now used by news services take seven minutes for a single photograph. The new tube looks like a flattened TV picture tube. Paper passing against the tube picks up charges from microscopic wires to reproduce a picture. The tube is a development of the Raytheon Company.

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IN SCIEN

HORTICULTURE

Strawberry Hormone Stimulates Pea Growth

➤ STRAWBERRY PLANTS can transmit a growth-promoting hormone to pea plants by way of temporary grafts, Dr. P. A. Thompson of the Scottish Horticultural Research Institute, Dundee, Scotland, has found.

To achieve the chemical transfusion, he grafted the top part of the embryo pea seedlings to the leafstalks of mature strawberry plants.

In strawberry plants growing under long-day conditions, a substance believed to be a hormone steps up vegetative growth and inhibits flowering. Gibberellic acid will produce the same effect, when sprayed on pea plants growing under short-day conditions, and will boost the strawberry's growth even further when sprayed on that plant.

To determine whether the strawberry hormone as well as gibberellic acid could stimulate growth in pea plants, Dr. Thompson grafted the young peas to the strawberries. The two different tissues did not grow together, but there was a transfer of growth hormone from strawberry to pea.

The amount of increased growth in the grafted peas was equivalent to that produced by applying one-fiftieth of a microgram of gibberellic acid to untreated pea plants.

Spraying the strawberry hosts with gibberellic acid caused even greater growth in grafted peas.

Dr. Thompson also reports in *Nature*, 188:682, 1960, that if the strawberry plants were chilled before grafting, the peas grew better than when grafted to unchilled hosts. This is probably because winter chilling of strawberries acts as a "dormancy breaker" that results in a growth spurt when the plant is placed in favorable growing conditions.

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NAVIGATION

Infrared System Cuts Haze, Fails in Fog

➤ SHIPS' PILOTS can cut through smoke and haze with an infrared light system described to an international conference on navigational aids in Washington, D. C., by Japanese researchers.

They said the infrared rays in a system called Noctovision can penetrate about 2,000 yards. A man with equipment to convert the invisible rays into a visible image could easily detect buoys and obstructions ahead.

The conference was sponsored by the U. S. Coast Guard.

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CE FIELDS

PHYSIOLOGY

Nerve Reflex Damages Irradiated Bone Marrow

➤ RUSSIAN STUDIES indicate that the nervous system plays a part in damaging bone marrow soon after whole-body irradiation.

Drs. S. Ya. Rapoport and S. M. Gasanova of the USSR Academy of Sciences in Moscow reported in *Biofizika* that rats X-irradiated by 800 to 1,000 roentgens showed detectable early bone marrow damage only after direct irradiation of the bone marrow. Irradiation of nerves only did not produce the same effect.

Damage to bone marrow was much more severe after whole body irradiation than after irradiation of only one arm or leg. Giving drugs such as Novocain and/or atropine, which essentially paralyze part of the nervous system, cut down on damage from whole body irradiation, but not on the damage from one-extremity irradiation.

If the nerve connections to the bone marrow or the receptors of the abdominal cavity were blocked, both methods of irradiating were less damaging.

The Russian researchers conclude in a report issued by the Department of Commerce's Office of Technical Information, that "the early damages to the bone marrow following whole-body irradiation of an animal are the result of both the direct action of X-rays on the bone marrow and on the nerve reflex reactions, the initial link of which is stimulation of the receptors of the abdominal cavity."

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ASTRONAUTICS

Man-in-Space Program Wastes Money and Effort

➤ THE DRIVE to put a man into space is having a bad effect on science in both the United States and Russia, a British space expert, Dr. R. L. F. Boyd of the University of London, charged.

He said that attempting to put a man into space is a prostitution of science since the main fruits of success will be political.

Scientifically, "we are trying to run before we can walk," Dr. Boyd charged at Oxford University. The effort is costing both the United States and Russia much because the highest grade scientific manpower and resources are being diverted to the space effort from other programs of far greater immediate importance.

At present, Dr. Boyd said, experiments involving satellites and rockets require high precision in orientation and stabilization. The presence of any living creature on board makes this infinitely more difficult, if not impossible, thus severely limiting the scope of the experiment. The space and

weight taken up by the occupant could, he believes, be used far more profitably by instruments.

Dr. Boyd believes the space effort is premature rather than useless. When exploration of other planets is imminent, sending a man will be more desirable than relying on such gadgets as remote controlled robots. However ingenious, robots will always be at a disadvantage due to the time taken by control signals in traveling to and from the earth.

Dr. Boyd is also on the staff of University College, London, where much of the British space exploration work, including some of the field experiments on the Woomera Rocket Range in Australia, is centered.

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TECHNOLOGY

AEC Studies Reactors For Nuclear Tanker

➤ NUCLEAR POWER is approaching the cost of conventional power for large fast ships operating on long trade routes. Capital costs for three different types of nuclear-powered ships range from 29% to 70% more than the cost of conventional powered ships, an Atomic Energy Commission study has shown. The study covered systems using a pressurized-water reactor, a boiling-water reactor with an indirect-cycle non-radioactive secondary steam characteristic, and a boiling-water reactor with a direct-cycle steam characteristic.

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MEDICINE

Anti-Coagulant Drugs Tend to Prolong Life

➤ ANTI-COAGULANT drugs prolong life and prevent further heart attacks for at least two years, a ten-year study at the University of Chicago has shown.

Dr. Richard J. Jones of the department of medicine reported the study, which involved 736 patients, to the University's Council on Medical and Biological Research in Chicago.

Also reporting progress in the field of heart research and treatment were Drs. Peter V. Moulder, associate professor of surgery, and Robert G. Page of the department of medicine. Dr. Page is also assistant dean of the division of biological sciences.

Dr. Moulder described laboratory research suggesting modification of open heart technique. He and his associates found that high oxygen concentration in heart by-pass procedures often results in increased resistance and high blood pressure in the lungs. This research emphasizes the importance of control of oxygenation of the blood and the size of the shunts produced in open heart surgery.

Dr. Page told of recent progress in studies of salt and water retention in congestive heart failure. He has been studying the effect of antagonists to the adrenal cortical hormones, particularly aldosterone. Some of these antagonists have therapeutic use, he said.

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TECHNOLOGY

Reversible Jet System To Propel New Boats

➤ A JET PROPULSION system for small speedboats that can be effectively steered in reverse has been introduced.

There is no rudder and no propeller. The system shoots a jet of water out the rear of the boat. Vanes that look like Venetian blinds can be moved to direct the jet in different directions and thus change the direction of the boat.

The manufacturer, Vanguard Industries of Cincinnati, Ohio, said the rear outlet vanes can be closed to force water down and forward and thus reverse the direction of the boat. The firm claimed the system requires less fuel than conventional engines and can be installed on any inboard powered craft.

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RADIO

Smog Layer Interrupts Radio Transmission

➤ WHEN TEMPERATURE inversion clamps an atmospheric lid over a city, high-frequency radio transmission from the ground to high-flying planes or missiles can be cut temporarily.

The inversion layer, already notorious as a major smog factor, can also interrupt contact between two land points in direct line of sight.

The findings were reported after three years of experiments by Prof. W. D. Hersberger, assistant professor Richard C. Mackey and Dr. Warren L. Flock, University of California at Los Angeles radio engineers.

In 1956, the three engineers set up a transmitter on the 24th floor of the Los Angeles City Hall and a receiver on top of the UCLA physics building, establishing a microwave path 11.4 miles long.

Transmitting at 36,000 megacycles, they found that signals came in strong and clear on smogless days. But on days with temperature inversion, signals faded, at times completely, especially when the inversion layer was below 1,000 feet and while the sun was rising.

The importance of the study lies in setting an upper frequency limit of 36,000 megacycles for radio transmission during smoggy days. Only on frequencies below 36,000 megacycles will communication be completely reliable.

Radio engineers have a very practical interest in determining this upper limit. Although they can easily penetrate the inversion layer by transmitting on lower frequencies, higher frequency transmission has an advantage. It requires a smaller receiving dish and less bulky equipment.

The experiments also showed that microwaves are a faster although more expensive means of fixing the height of an inversion layer, especially between 500 and 1,000 feet, than the present method of sending up balloons.

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