MEDICINE

Minor Fractures of Foot Treated Without Cast

➤ MINOR FOOT FRACTURES, involving the fifth metatarsal, can be successfully treated without the usual six-week period in a walking cast, a Birmingham, England, surgeon reported in the British Medical Journal, April 14, 1962.

Heavy workers who must stand or walk at their jobs, light workers who sit most of the time, housewives and school children were divided into groups to assess various forms of treatment in a study of 146 fractures.

In addition to plaster-of-Paris casts, the treatment given to 65 patients, crepe bandages were used on 28, without injection of medication. Procaine in two percent solution was infiltrated into the fracture site of 26 patients, and 27 received hydrocortisone in the location of the fracture, after first being injected with a small portion of procaine to relieve pain.

After using X-rays to be sure of the extent of injury and healing, the surgeon concluded that using procaine or hydrocortisone is a better treatment than strapping the foot, and much better than using plaster.

Of the 65 patients in walking casts, 66% were off work for more than a week, the average being three to four weeks; 40% were off work for four weeks or more. Fourteen of them were left with stiffness in the injured foot.

Only two of the 26 patients treated with procaine lost more than two days of work, and none had any resulting disability. Immediate relief of pain was usual. The two who did not respond were a foreman mechanic who had suffered a direct blow resulting in a comminuted (shattered) metatarsal, and a housewife who reported worse pain after the injection. Both were placed in casts.

Hydrocortisone was used to lessen local inflammatory reaction to the injury. Only two of the 27 who were given this treatment were relieved of pain immediately, but all were free of pain within a week and returned to work.

Most of the housewives lost no time from work regardless of the type of treatment, Dr. J. B. Pearson of the Children's Hospital, Birmingham, reported.

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IMMUNOLOGY

Severe Diseases Respond To Hyperimmune Serum

➤ SEVERE STAPHYLOCOCCIC INFECTION and other diseases respond to treatment with hyperimmune serum, or human protein antibody, Dr. Joseph Stokes Jr. of the University of Pennsylvania told the American College of Physicians meeting in Philadelphia.

"With sulfonamide, penicillin and other antibiotics to come, the medical profession and pharmaceutical industry have tended to neglect the only specific 'magic bullet' against each individual disease, which is human protein antibody," Dr. Stokes said. "There are no antibiotics that are completely specific."

As an example, a specific hyperimmune serum, a material called vaccinia immune globulin (VIG), which offsets complications sometimes arising from smallpox vaccination, is now available through the American National Red Cross to physicians in the United States.

Dr. James H. Pert, director of research for the American Red Cross Blood Program, said that his staff was doing preliminary work on three or four hyperimmune sera, but that each serum has its problems and it is too soon to announce certain results. Both Dr. Stokes and Dr. Pert pointed out that the pharmaceutical industry is not particularly interested in hyperimmune serum because there might be no more than 500 persons in the country demanding any one kind.

Most people, for example, have no severe reaction to smallpox vaccination, but children with eczema, or those whose eyes may become infected from rubbing some of the vaccine into them, may be saved from loss of vision through use of VIG.

Hyperimmune serum must be taken from populations that have become immune to a specific disease. VIG was obtained from Armed Forces recruits, whose gamma globulin showed 30 times the amount of antibody that ordinary gamma globulin shows.

All hyperimmune sera are types of gamma globulin, which has often been effective in reducing the severity of measles because nearly everyone has had measles and the gamma globulin contains measles immunity. Dr. Stokes pointed out that if hyperimmune serum is given to a measles patient early enough, no rash will appear.

"Human serum is many times as effective as horse serum," he said.

The James D. Bruce Memorial Award of the American College of Physicians was given to Dr. Stokes at this meeting for his previous work in preventive medicine in passive immunity.

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MEDICINE

New Trachoma Vaccine Used in Pilot Study

➤ TRACHOMA, the infectious eye disease that frequently leads to blindness, may be stamped out if a new trachoma vaccine being used in the first pilot study of its kind in this country is successful. The disease affects 15% of the world's population.

Because trachoma has been prevalent among Indians of the Southwest, the test program is being started among 400 school children in grades 9 through 11 at Indian boarding schools in the Phoenix, Ariz., area. The first dose is being given this month and a second will be given before the end of the school year, the U.S. Public Health Service has announced.

Dr. John C. Snyder, dean of the Harvard School of Public Health, which helped develop the vaccine, is directing the test program.

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IN SCIEN

PUBLIC HEALTH

New Research Division At U.S. Health Center

➤ A NEW DIVISION of Research Facilities and Resources at the National Institutes of Health has been announced by Surgeon General Luther L. Terry of the U.S. Public Health Service. It is expected to get under way July 15, 1962.

Dr. Frederick L. Stone, who has had wide experience at NIH and in other agencies, will head the new division, which will centralize administration of NIH programs that provide broad support to the country's biomedical research institutions.

Dr. Stone is now acting chief of the Division of General Medical Sciences.

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PHYSICS

Pure Molybdenum Found To Act as Superconductor

➤ A NEW SUPERCONDUCTING element, in which an electrical current seemingly flows forever without resistance, has been found in very pure molybdenum.

The discovery suggests that many other metallic elements may also be superconductors if they are just made pure enough. The finding of the new superconducting element by scientists at Bell Telephone Laboratories, Murray Hill, N. J., is reported in Physical Review Letters, 8:813, 1962, published by the American Physical Society.

Drs. Theodore H. Geballe and Bernd T. Matthias, with Ernest Corenzwit and George W. Hull Jr., discovered the new superconductor, the 24th known and the first since 1953. Previous investigators had failed to find molybdenum's superconducting properties because of traces of impurities. The Bell Telephone scientists used samples much more pure than those previously studied.

They found that molybdenum becomes a superconductor at one degree Kelvin, which is close to 456 degrees below zero Fahrenheit.

The pure molybdenum samples were prepared by heating molten pellets of the metal for a long time in an arc furnace until the impurities were "boiled off," and by growing a single crystal, then purifying it by electron-beam melting and floating-zone refining.

The discovery of the importance of purity on superconductivity will have an influence on theories about the nature and occurrence of superconductivity. It suggests that metals previously believed not to be superconductors should be examined again in a very pure state.

Dr. Matthias is now at the University of California, La Jolla, Calif.

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CE FIELDS

SPACE

Space Agency Launches Science Training Program

➤ A NEW PROGRAM to train scientists and engineers to meet the needs of the national space effort is being launched by the National Aeronautics and Space Administration.

James E. Webb, NASA administrator, announced the program will begin next fall in a speech at the Institute of Environmental Sciences meeting in Chicago. Each of ten universities will train ten predoctoral graduate students during the first year of the experimental program.

The U.S. space effort is aimed at making practical use of space technology and exploring the solar system with men and scientific instruments. To accomplish these goals, Mr. Webb said, greatly increased numbers of graduates in science and engineering are needed. The commodity in most critically short supply, he noted, is "brainpower."

Students chosen for the NASA training program will receive $2,400 a year for 12 months' study and expense allowances up to $1,000 a year according to the practice of individual universities. The universities will be reimbursed for tuition, fees and other expenses of the program. Cost of the program for the first group of trainees is expected to be about $2,000,000.

The institutions selected are Rensselaer Polytechnic Institute, Troy, N. Y.; University of Maryland; Georgia Institute of Technology; University of Michigan; University of Chicago; University of Minnesota; State University of Iowa; Texas A. and M. College; Rice University, Houston, Texas, and the University of California at Los Angeles.

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PUBLIC HEALTH

Alaska Caribou Has High Level of Strontium-90

➤ RADIOACTIVE STRONTIUM-90, a bone-seeking fallout product of nuclear explosions, is more highly concentrated in Alaskan caribou than in any other food animal.

The caribou, a native North American reindeer, is a staple in the diet of Eskimos. Caribou from the northern tundra have been found to carry 10 to 20 times the level of strontium-90 in domestic cattle.

The Eskimos have four times the strontium-90 content of the average for the world population of the north temperate zones.

These findings were reported by Dr. Arthur R. Schulert in Science, 136:146, 1962, published by the American Association for the Advancement of Science. Dr. Schulert is a biochemistry professor at Vanderbilt University, Nashville, Tenn., now attached to the U.S. Navy Medical Research Unit No. 3, Cairo, Egypt.

Dr. Schulert's findings may have some bearing on fallout dangers to humans, animals and plants from proposed nuclear explosions under the Atomic Energy Commission's Project Chariot at Cape Thompson, on the northwest coast of Alaska. The Project Chariot explosion to excavate a harbor is part of the Plowshare program for developing peaceful uses of nuclear blasts.

The Atomic Energy Commission is now conducting studies of the environment and the interrelationship of humans, plants and animals as a preliminary to deciding whether or not to set off the nuclear explosion, but no actual blast has been authorized. Final decision must come from the President.

The Committee for Nuclear Information in St. Louis charged last year that fallout dangers from Chariot were a potential threat to the entire northern Alaskan food chain of plants, animals and men.

Most of the fallout found in Alaska comes from Russian tests.

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PUBLIC HEALTH

Safety From Fallout Seen For Breast-Fed Babies

➤ MOTHERS who can breast-feed their babies may protect them from strontium-90 fallout dangers, a newly formed committee on environmental hazards of the American Academy of Pediatrics reported.

The pediatricians also called attention to the hazards of strontium-89 and iodine-131. Strontium-89 occurs in the same general fallout pattern as strontium-90. However, it has a relatively short half-life of 51 days, decaying almost entirely before it leaves the atmosphere.

The short half-life of iodine-131, 8 days, limits the problem of radioactive contamination of food by this element to about two months following any excessive contamination of the atmosphere. In large quantities iodine-131 carries a danger of possible cancer-causing action on the thyroid gland because of the thyroid's unusual capability to concentrate this element.

Radioactive strontium-90 collects in the bone. The present strontium-90 content of milk is less than that which is believed capable of inducing harmful effects in infants, children or adults during average lifetimes.

The pediatricians pointed out that laboratory methods for the removal of strontium-90 from milk are now being tested. However, about 80% of strontium-90 is eliminated from the human body immediately so that body burden of the radioactive element increases more slowly than that of the environment.

The cow thus eliminates 80% of environmental strontium from its milk, the committee explained.

"The additional safety factor that mothers can provide through breast feeding is one to be carefully pondered by pediatricians," the committee reported.

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ASTRONOMY

Birth Rate of Small Stars Now Lower Than Long Ago

➤ ONE BIRTH RATE, as least, is lower today than long ago—that of small stars in the Milky Way galaxy, the gigantic pinwheel of billions of stars in which the earth and other planets of the sun's system are found.

Large stars in the neighborhood of the solar system are also being formed at a slower rate than earlier in the life of the Milky Way.

The galaxy as a whole therefore must have been a much brighter object in the past than it is now.

These are the conclusions of Dr. Maarten Schmidt, astronomer of Mt. Wilson and Palomar Observatories, operated jointly by the California Institute of Technology, Pasadena, Calif., and the Carnegie Institution of Washington.

His conclusions are based on a study of the amounts of metals in the atmospheres of 56 small stars within a few hundred light years of the solar system. A light year is the distance covered by light, traveling at 186,000 miles a second, in a year, or six million million miles.

The amount of metal in a small star's atmosphere is believed to indicate its age. The higher the metal content, the younger the star because the interstellar material from which stars are formed is becoming increasingly contaminated with metals.

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MEDICINE

Overall Cure Rate Now One in Three for Cancer

➤ THERE IS GOOD news from the American Cancer Society—the overall cure rate from cancer is now one in three, due to drugs, surgery and radiation.

This compares with one in seven cured 25 years ago.

Also the death rate from cancer of the uterus has hit a new low of 13.3 per 100,000 women, half of what it was 25 years ago.

Increasing research in foiling cancer by chemical agents, viruses and immunology offers hope of new cures and possible immunization.

These facts and other progress are presented in the American Cancer Society's annual report.

The United States is two decades ahead of the rest of the world in virus studies. U. S. scientists may be the first to confirm the growing belief that viruses cause human cancers.

The Society called for research to investigate "why stomach cancer has declined 40% in the last 25 years." The consistent decrease poses a mystery to which no one has yet found an answer.

Nevertheless, the Society warned, unless new progress is made, total deaths from cancer during the 1960's will probably be about 3,000,000 in the U. S.

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