

MEDICINE

The Fight Against Arthritis

Treatment can relieve the pain and crippling effects of this widespread disease while the search for a cause and cure goes on, Faye Marley reports.

► TODAY ARTHRITIS STRIKES one out of five families. More than 11,000,000 persons in the U.S. alone have some form of this painful, and often crippling, affliction.

So far there is no cure, and the fight against this disease will go on until both cause and cure are found. The National Institute of Arthritis and Metabolic Diseases, Bethesda, Md., will spend \$9,000,000 on research in rheumatic diseases during the coming year.

The weapons available now, aside from research, consist of early, accurate diagnosis, continually tested new drugs and treatment, most important of which is exercise prescribed by a qualified physician.

Osteoarthritis, the most common type, happens to nearly everyone with advancing years. But it is rheumatoid arthritis that is most crippling.

Rheumatoid arthritis is found most frequently in women 40 or above, but no age is exempt; it even appears in infancy. Men, of course, are often afflicted.

Another disabling type of arthritis, which most often occurs in young men, is rheumatoid or ankylosing spondylitis. Without proper care the spine gradually becomes bent over and stiff, and other joints, particularly the hips and shoulders, also may be affected.

Dr. Joseph J. Bunim, clinical director of the National Institute of Arthritis and Metabolic Diseases, told *SCIENCE SERVICE* that it is important for the family physician to diagnose the type of arthritis as precisely as possible.

Test for Diagnosing Arthritis

A simple and fast test for diagnosing rheumatoid arthritis is called the Bentonite Flocculation Test (BFT). Dr. Bunim said it is not only as accurate as other tests in use, but it has the practical advantage of giving results in 20 minutes instead of the few days needed with other methods. (Only the Latex Fixation Test is as quick, and bentonite is more stable than latex.)

"We mix a small amount of colloidal clay called bentonite, which is widely used for commercial purposes," Dr. Bunim said, "with normal human gamma globulin. To this we add a drop of blood serum from the person we are testing. If the test is positive for rheumatoid arthritis, the bentonite particles will clump together or flocculate within a few minutes and we can see the results under a microscope."

Other signs that show the difference between the rheumatoid type and osteoarthritis are these:

The palm of the osteoarthritis patient will be dry, whereas the rheumatoid patient's hand is usually moist.

The osteoarthritic patient's joints will be hard, bony and knobby, in contrast to the soft swelling of the rheumatoid's.

Nodules under the skin are seen in 20% of rheumatoid arthritis patients but are absent in the osteoarthritis patient, who also shows no signs of elevated sedimentation rate and moderate anemia, common to the rheumatoid patient.

X-ray pictures are likewise important in finding out which of these two types of arthritis may be present.

One of the more important discoveries in the past 10 or 15 years of research has been the "rheumatoid factor," which causes sensitized particles to stick together in the serum of patients with active rheumatoid arthritis. The BFT is based on this factor.

An important theory concerns autoimmunity. Sir Frank Macfarlane Burnet, the Australian virologist who shared the 1960 Nobel Prize in Medicine, discovered that the body loses its ability to distinguish between tissue proteins that originate from its "self." It thus reacts to its own cells as if they were foreign material.

Cortisone was first used for treating rheumatoid arthritis in 1948. One of the

newest additions to the group of anti-inflammatory steroid compounds, including hydrocortisone, triamcinolone and prednisone, is dexamethasone, also called by trade names such as Decadron, Deronil, Gamma-corten and Delenar.

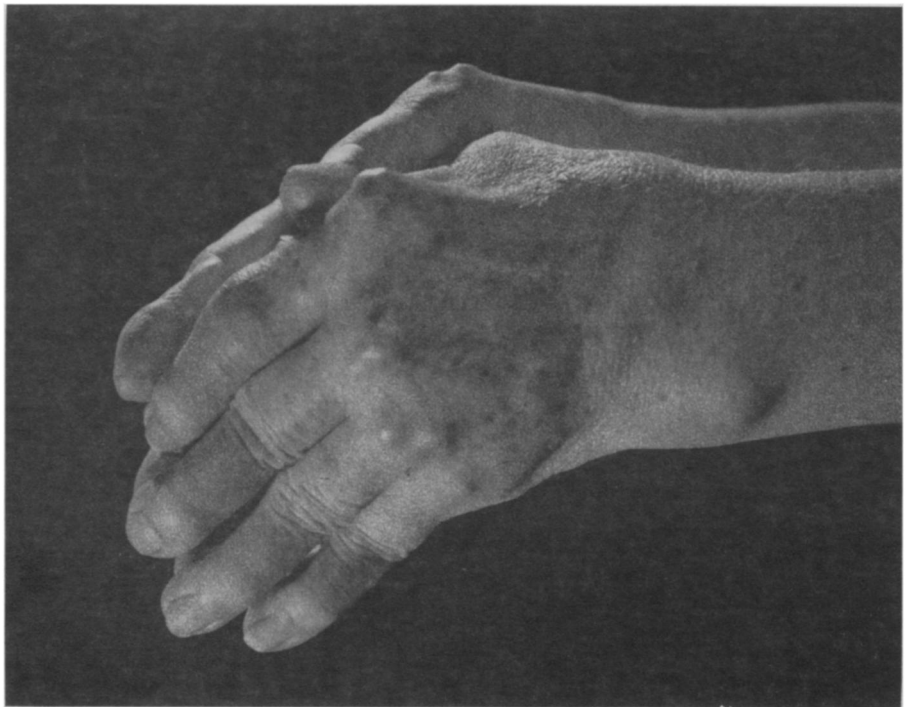
Dexamethasone is about six times more potent than prednisone and about 25 times more potent than hydrocortisone. Smaller amounts may provide the same or more relief than is obtained with larger doses of the older steroids. Some patients who do not respond to other treatment may benefit from dexamethasone. However, Dr. Bunim said potency in itself is of no real advantage.

Other treatments for patients who do not respond to aspirin, heat, rest and exercise—the conservative treatments—may include a choice of gold compounds, phenylbutazone or antimalarial drugs.

Although the cure for rheumatoid arthritis is not yet in sight, Dr. Bunim emphasizes the improvement in patients treated with available agents.

"They frequently enhance the functional capacity of the patient, restoring him to a state of self-sufficiency and employability," Dr. Bunim said.

"The risk involved in prescribing an effective anti-rheumatic agent that is potentially toxic must constantly be balanced by the real risk of permitting the disease to progress relentlessly to destruction, deformity, disability and demoralization."



ARTHRITIS DID THIS—The gnarled hands of this rheumatoid arthritis victim belong to one of millions crippled by this disease.

The National Institute of Arthritis and Metabolic Diseases, along with the Arthritis and Rheumatism Foundation and other agencies dedicated to rheumatic diseases and their cure, deplors quack remedies.

Among the "remedies" that cost arthritis sufferers a quarter of a billion dollars a year are treatments ranging from "immune milk" to uranium. Vibrators and other devices, liniments, food supplements and "treatment centers" attract victims who are willing to pay any amount to get relief.

If a patient is overweight, physicians treating arthritis may prescribe a reducing diet, or if hormones are being used, may restrict salt use, but NIH has issued a statement that says there is no scientific evidence that specific items in the diet of the average arthritis patient will cure or benefit his condition.

"The Arthritis Hoax," Public Affairs Pamphlet No. 297, prepared in cooperation with the Arthritis and Rheumatism Foundation, describes frauds and fallacies costing arthritis sufferers \$250,000,000 annually.

Government agents have had to take action against operators of abandoned uranium mines, for example, which under the name of "uranitoriums" have been luring arthritics who hope to benefit from the radiation. On examination, the amount of radiation in the ore of such mines was found to be about equal to that received from an illuminated watch dial.

Bonafide treatment recommended in the U.S. Public Health Service pamphlet, Strike Back at Arthritis, includes:

1. Watching posture. When in bed the patient should lie flat on the back, with a board under the mattress. At least twice a day for about 15 minutes he should lie on his stomach, keeping hips and knees straight.

When walking, the arthritic should let the arms swing easily at the side, step or "push off" from the ball of the foot, not walk flat-footed, walk stiff-legged or with hips and knees bent.

When sitting, a chair should be used with a firm seat and straight back. The patient should avoid sitting in low chairs or in soft, stuffed chairs. He should keep his feet flat on the floor, his hips and shoulders up against the back of the chair.

2. Use of heat. This includes tub baths, with temperature between 100 and 102 degrees Fahrenheit, for about 15 to 20 minutes once a day.

Hot compresses may be placed directly on the joint or part to be treated for no more than 20 to 30 minutes at a time.

A 250-watt reflector heat bulb (not a sun lamp) is effective in heating a single part of the body, such as the shoulder, for 20 to 30 minutes at a time. This should be at least 18 inches away from the skin or farther away for comfort.

A paraffin bath is useful for treating the hands and wrists. A three-quart pot placed in hot water should be used to heat three pounds of ordinary paraffin, mixed with six ounces of mineral oil, to 125 degrees Fahr-

(Continued on p. 374)

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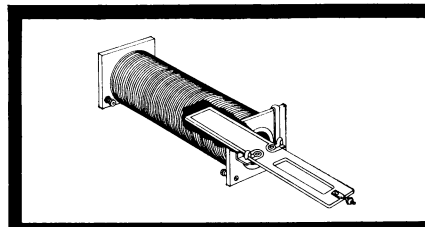
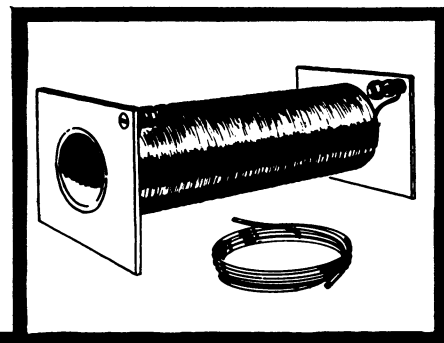
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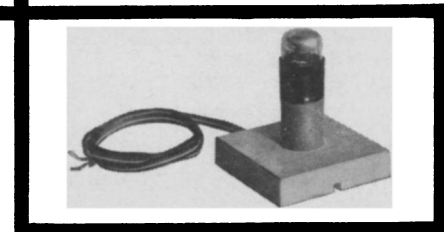
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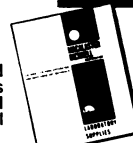


Current Balance Kit — used with the Solenoid to measure a magnetic field in fundamental units of mass length and current. The force of gravity at one end of a mechanical arm balance counteracts the magnetic force of interaction between an unknown field and a current-carrying segment of wire at the other end. Each \$1.80.

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Fight Against Arthritis

(Continued from p. 371)

enheit. With fingers curled, the hand and wrist should be dipped in and out of the mixture, waiting a few seconds to let the paraffin harden slightly.

The dipping should be repeated eight or ten times until a thick glove of solidified paraffin is formed. To prevent the paraffin glove from cracking, the fingers should not be moved.

The "gloved" hand should be wrapped in wax paper and then in a bath towel, held in place by rubber bands for 20 minutes. The paraffin, when peeled off, can be returned to the double boiler for repeated use.

Massage helps in some cases, but may cause harm if not done properly. It should

not be done directly over acutely inflamed arthritic joints. The family doctor should decide whether or not massage would be beneficial. But mechanical vibrators or massage machines are not recommended.

Exercise, the most important treatment to prevent crippling, must be prescribed by the doctor. A number of non-tiring exercises with illustrations are described in the PHS pamphlet.

Splinting or using a cast may be prescribed by the physician.

Good fitting shoes are essential. They should be prescribed.

Canes or crutches may help.

Self-help devices can be ordered from the Arthritis Self-Help Office, Institute of Physical Medicine and Rehabilitation, 400 East 34th St., New York, N. Y.

• Science News Letter, 80:370 December 2, 1961

INVENTION

Patents of the Week

► A GUARD to protect hose during shoe shines has been patented.

Nicola Francone of Chicago, Ill., developed the device especially for shoe-shine establishments so that workers could avoid getting polish on any customer's hose.

The hose guard, which received patent No. 3,008,146, is made of sheet material such as paperboard, kraft paper or even plastic, that could be easily disposed of after a single use or a limited number of uses.

An attachment that converts an electric razor into a hair trimming device won patent No. 3,008,233 for Jacob E. Waggoner of Charles City, Iowa. It causes the hair to enter the relatively narrow interior slots of the electric razor's regular shaving head, where it is cut.

For next spring's legion of lawn cutters, George I. Wood Jr. of Des Moines, Iowa, has found a method for preventing grass deposits from accumulating on the underside of a rotary mower hood. He was awarded patent No. 3,008,283 and assigned the rights to Western Tool and Stamping Co., also of Des Moines.

An extra plate is installed inside the hood near the top, and is rotated at high speed, thus forcibly ejecting the grass. Mr. Wood said he had found woven glass filaments or plastic to be the best material for the extra plate.

An Australian has come to the rescue of children suffering from infantile eczema by inventing a method, patent No. 3,008,466, for partially restricting their arms. Grace Johnstone Adam of the Royal Alexander Hospital for Children near Sydney said the usual method of treating acute eczema is to bandage and tie the child down, with arms and legs extended, on a bed, to prevent him from scratching himself.

Her device consists of perforated flexible material laced together so that partial movement of the arms is possible.

A carrier, with a detachable cabinet section, for automobile tops won patent No. 3,008,784 for Almon Allard of Wilmington,

Mass. It includes a platform with a number of storage elements arranged about its margins and enclosing a central storage well. One or more of the marginal storage elements may be detached from the platform to provide access to the well and to make the contents of the removable section more readily available.

A thermoelectric water cooler for bubble-type fountains won patent No. 3,008,299 for Addison C. Sheckler of Cato, N.Y., who assigned rights to Carrier Corporation, Syracuse, N.Y.

Conventional water coolers, Mr. Sheckler claims, require frequent maintenance of the refrigeration system, are cumbersome in size and a source of noise. By using thermoelectric elements, which have no moving parts, the problems of noise and maintenance are substantially eliminated. Mr. Sheckler improved the efficiency of thermoelectric cooling by directing the inlet water and cooling water in opposite paths to achieve the least possible temperature change across the thermocouples.

A method and apparatus for reproducing and displaying seismic records won patent No. 3,008,792 for William H. Cox of Beaumont, Texas, who assigned rights to Sun Oil Co., Philadelphia.

The conventional reproduction of seismic records, side-by-side traces in an oscillograph, is hard to interpret, particularly in determining the precise time of the occurrence of reflections, Mr. Cox said. Using his invention, the signals are converted to yield photographically or otherwise variable density traces that take the form of variable density dots.

• Science News Letter, 80:374 December 2, 1961

IMMUNOLOGY

Nasal Spray Vaccination Reported by Japanese

► MEASLES VACCINATION by nasal spray was reported by a Japanese scientist at the First International Conference on

Measles Immunization in Washington, D.C.

Dr. Yoshiomi Okuno of Osaka University, Osaka, Japan, reported cultivation of the Toyoshima strain of measles virus in the birth sac cavity of developing chick embryos.

When given by nasal spray to children, the virus produced mild, measles-like symptoms eight to nine days after vaccination with striking antibody responses, Dr. Okuno said.

• Science News Letter, 80:374 December 2, 1961

PUBLIC HEALTH

Names and Addresses of Syphilis Cases Required

► THE NAMES and addresses of all persons with syphilis are now required by the Pennsylvania Department of Health.

The 89th annual meeting of the American Public Health Association in Detroit was told that some 24,792 persons have been followed up because of this change in reporting. Numbers were formerly used.

Dr. Charles L. Wilbar Jr., secretary of health, Commonwealth of Pennsylvania, said this has proved to be an effective method of case finding, and names of individuals are kept in strictest confidence. Only 15 out of 8,000 physicians have refused to give any information.

• Science News Letter, 80:374 December 2, 1961

TECHNOLOGY

Model Used to Teach How Shock Waves Form

See Front Cover

► A CONE MODEL in a supersonic tunnel is now being used to teach students how shock waves are formed.

The tunnel and a schlieren apparatus (an optical system making shock waves visible) demonstrate the density variation of the air around the twenty degree cone cylinder. The bow shock waves formed around the cylinder at Mach 3 (three times the speed of sound) can be seen on this week's cover.

The device, designed by the Aerolab Supply Co., Hyattsville, Md., is being used at Yale University, Northwestern University and the Illinois Institute of Technology. A similar model is being used at the University of Maryland.

• Science News Letter, 80:374 December 2, 1961

Questions

ANTHROPOLOGY—How many years ago did Shanidar man live in a warm climate? p. 363.

MEDICINE—Which age group of women most frequently have arthritis? p. 370.

SPACE—How much will the Nimbus satellite weigh? p. 366.

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