

notify it of promotions or changes of task. Socialist state the honeyed commonwealth may be; but it is no dictatorship.

Science News Letter, February 8, 1941

PHYSIOLOGY

Discover How Vitamin D Acts to Cure Rickets

ALMOST every school child can tell you that vitamin D, the sunshine vitamin, cures and prevents rickets. Neither the doctors who prescribe vitamin D for prevention or cure of rickets, however, nor the scientists who discovered the vitamin and learned how the sun's rays produce it have heretofore been able to tell exactly how the vitamin does its rickets curing and preventing work.

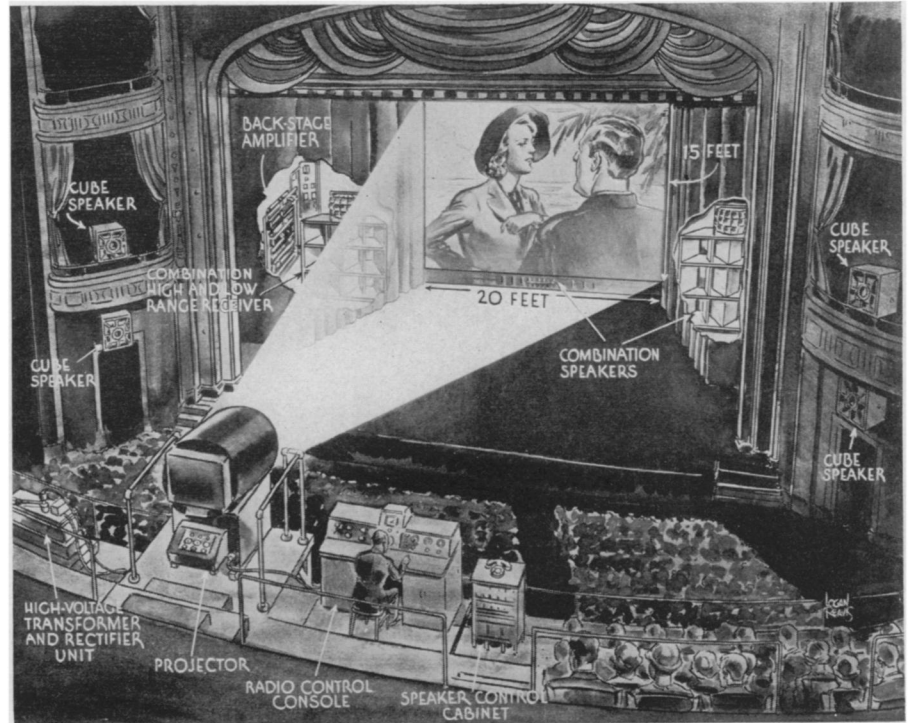
Now it has been discovered that the vitamin cures rickets or prevents it probably through its action on both the kidneys and intestines. Discovery of the vitamin's effect on kidney function has just been reported by Dr. Harold E. Harrison and Dr. Helen C. Harrison, of Cornell University Medical College. (*Journal of Clinical Investigation*, January.) The discovery, like so many others in science, depended on previous research by many other scientists who each added a bit of evidence that gave clues for further discoveries.

The bowlegs and other bony deformities of rickets, as you probably have heard, are due to the fact that the bones do not get enough calcium and phosphorus to make them hard and strong. Even with a plentiful supply of calcium and phosphorus coming into the body in the food, the bones fail to calcify unless there is also a plentiful supply of vitamin D.

The vitamin, scientists found, helps in the process by which the calcium and phosphorus from food are absorbed from the intestines into the blood for transportation to the bones. But this is not the only way in which the vitamin helps to prevent or to cure rickets. Even with plenty of phosphorus in the blood, rickets can develop because the phosphorus, instead of going to the bones, is eliminated through the body via the kidneys.

Vitamin D, the Harrisons found, also acts to prevent this loss of bone-building phosphorus. The kidneys may take the phosphorus out of the blood but when vitamin D is present, instead of eliminating the phosphorus with waste material, they return it to the blood in sufficient amounts for bone building purposes.

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NEXT: TELEVISION NEWS REELS?

When your local theater is equipped to show television with sound, this is the way the instruments may be placed.

ENGINEERING

Television Pictures Thrown On Screen From Balcony

In Order To Use Maximum of Light, Projector Is Schmidt Astronomical Camera in Reverse Position

TELEVISION pictures projected on a theater screen 15 by 20 feet, from a projector in the balcony sixty feet away, were demonstrated in New York by RCA engineers to show the Federal Communications Commission the latest advances in this field.

In order to use the greatest possible amount of light, a projector is used which is really an astronomical camera of the Schmidt type in reverse. The seven-inch face of the high voltage kinescope, on which the picture is formed, faces away from the screen, towards a 30-inch concave mirror. This reflects the image through a glass plate to correct certain faults or aberrations, then to the screen. By the method used for rating camera lenses, the system has a speed of F. 0.7.

The Commission was also shown a

home television receiver in which the pictures were projected to a screen 13½ by 18 inches. This used a conventional type of high speed lens, treated, however, with non-reflecting films, to reduce light losses.

Some of the views witnessed were transmitted from the RCA mobile television unit, stationed at Camp Upton on Long Island, 68 miles away. Automatic relays, at Hauppauge and Bellmore, picked up the short range signals and passed them along. A new horn type antenna was used to receive them, in the relay towers and finally in a window on the 62nd floor of the RCA building.

Radio facsimile, by which a newspaper complete with illustrations can automatically be printed in a home re-

ceiver, reproducing the original in the broadcasting station, can be combined with simultaneous broadcasts, on the same wavelength, the engineers showed the Commission.

The facsimile was broadcast with ordinary "amplitude modulation," in which the waves are the same distance apart,

but vary in their height. The same carrier was given frequency modulation, by which the distance between the waves is changed in step with the sound vibrations. At the receiving end, the two were sorted out, and each used to operate the proper receiver.

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RESOURCES

U.S. Has Plenty of Vitamins, Vaccines, and Anesthetics

Only Drugs of Which Supplies in United States May Run Short if War is Prolonged Are From Certain Plants

THE ONLY drugs of which supplies in this country may run short if war in Europe is prolonged are those drugs obtained from certain plants, S. De Witt Clough, president of the Abbott Laboratories, reports in the forthcoming issue of *War Medicine*.

War Medicine is the new medical journal published by the American Medical Association.

Of vitamins, including cod liver oil, vaccines and other biologics, hormone remedies such as insulin for diabetes, sulfanilamide and the other sulfa remedies, anesthetics of all types, antiseptics, disinfectants, bandages and surgical dressings, the United States has plentiful supplies, Mr. Clough's survey shows.

"The drug industry today is in a much better position to supply the medical profession, hospitals, the Red Cross, the War Department and governmental agencies with pharmaceuticals and medicinal chemicals than it was during the World War," he declares.

The botanical drugs of which there is some danger of a war shortage include such items as belladonna and scopolamine, the latter familiar to the layman through its use for inducing "twilight sleep."

"There is already a growing scarcity of such items as belladonna root and hyoscyamus, a source of scopolamine," Mr. Clough reports. "While these botanicals have been coming from foreign countries, it is reasonable to believe that sufficient supplies of belladonna can be cultivated in this country to take care of civilian and military requirements.

"This was the case in the World War, when not only belladonna but digitalis and other medicinal plants were grown in Washington, Oregon, California, Min-

nesota, Michigan, Indiana, New Jersey, Pennsylvania, Virginia and Florida. Digitalis of excellent quality is still grown in the United States but not in sufficient quantity, as yet, to supply domestic, export and military needs. It is hoped that domestic cultivation will be increased.

"Atropine sulfate can be obtained from jimson weed, which can be grown on almost any farm land. It may also come about that the alkaloid, atropine sulfate, can be synthesized. When the World War was over, the cultivation of belladonna and some other medicinal plants was practically abandoned in the United States, owing to the lower cost of labor in other countries."

Mr. Clough urges that agricultural departments of state universities and colleges grow such medicinal plants in this country as are adapted to the soil and climate of the various states and experiment with others not yet cultivated in this country.

On the bright side, Mr. Clough reports that we are in excellent condition to produce large quantities of biologic items such as vaccines and antitoxins; that we could take care of a large part of the world requirements for bandages and dressings; that we are in "an advantageous position" to produce enough vitamin oils to take care of the entire western hemisphere; and that we lead the world in the production of anesthetics.

There is no fear of shortage of minerals used in medicine such as mercury, arsenic or bismuth, since these are either available here or may be obtained from South America. We can make sulfanilamide, sulfapyridine and sulfathiazole from materials produced in this country.

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PHYSIOLOGY

New Ideas on Hot-Water And Drugs For Pain

FAMILIAR stand-bys for the relief of pain—hot-water bottles, ice bags, aspirin and other drugs including codeine and alcohol—have recently been put through some rigorous scientific tests by two groups of scientists with results that your doctor may be applying before long.

Instead of ordering a hot-water bottle, to relieve pain, for example, he may prescribe the use of a device that intermittently applies heat or a cooling breeze or both alternately. Results of using such a device are reported by Dr. George D. Gammon and Dr. Isaac Starr, of the University of Pennsylvania. (*Journal of Clinical Investigation*, January.)

The hot-water bottle and the ice bag relieve pain by counterirritation. When you rub the sore spot after bumping against a sharp table edge, you are also using counterirritation to relieve the pain. The Philadelphia doctors tested various counterirritants on themselves and concluded that periodic rather than continuous counterirritation, produced the maximum relief of pain. Tests of some 20 patients with the special device for producing periodic counterirritation suggested that proper use of such a method would give much more relief than "haphazard application of hot-water bottles and ice bags."

The effects of pain-relieving drugs were tested by Dr. H. G. Wolff, Dr. J. D. Hardy and Dr. H. Goodell, of the Russell Sage Institute of Pathology, New York City. Acetylsalicylic acid, familiarly known as aspirin, relieves pain but has very little psychological effect, their studies, also reported in the *Journal of Clinical Investigation*, show. Acetanilid and acetophenetidin are popular as headache remedies, it appears from the studies, because besides relieving pain these substances lessen anxiety and restlessness.

Alcohol, like morphine, has a double action in that it both relieves pain and makes the person feel detached about the pain even while perceiving it.

Giving two pain-relieving drugs together, for example codeine and acetylsalicylic acid, does not increase the pain-relieving action beyond that of the most active ingredient of the combination, but does increase the sedative effects, which may be what your doctor wants to achieve when he prescribes such a combination.

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