

## MEDICINE

# New Use for Cancer Drug

An antimetabolite already known for its anti-cancer action is being combined with a compound that protects the patient against toxic effects and permits long-term treatment.

AN "ANTI-VITAMIN" and a vitamin factor have been used successfully in treating patients with inoperable cancers of the head and neck.

While the technique of using Methotrexate, an antimetabolite, and citrovorum, a vitamin factor, caused temporary partial regression of the tumor in ten out of the 18 patients treated, the researchers warn that it is "still experimental."

However, it promises a new and potentially valuable approach to cancer chemotherapy, a report by the New York Veterans Administration Hospital, Sloan-Kettering Institute for Cancer Research and Memorial Center for Cancer and Allied Diseases suggests. Drs. Robert Sullivan, Edward Miller and Marguerite P. Sykes report on the method in *Cancer*.

A plastic tube is introduced into the carotid artery, the principal blood vessel supplying blood to the head and neck. When the tube is correctly in place, it is attached to a pump which feeds a saline solution containing Methotrexate into the artery at a rate of 2,000 cubic centimeters each 24 hours. This treatment is continued for six to eight days. All during this time, citrovorum is injected at regular intervals, protecting the patient against the harmful effects of the extremely high doses

of Methotrexate he is receiving.

Methotrexate has been known for more than ten years to be effective against some cancers—acute leukemia in children and choriocarcinoma, a rare cancer which forms in the uterus—but two problems are involved with its use.

First, the researchers point out, a slow infusion technique is needed so that this drug and related antimetabolites, which are slower in their action than other anti-cancer drugs, can be administered over a long period of time.

Second, an antidote is needed to combat the general toxicity that results with long-term local administration of Methotrexate which "leaks" into the general circulation. Citrovorum, which is closely related to the vitamin folic acid, is known to prevent the toxic effects of Methotrexate. (Methotrexate is believed to act by interfering with the supply of folic acid needed by rapidly growing cancer cells.)

This new method, which provides both the slow infusion and the antidote, can be tried with different combinations of anti-cancer drugs for treatment of other cancers, the scientists say. It will be tried on cancers which spread locally and can be treated in this way.

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## DENTISTRY

# Music Used in Dentistry

MUSIC HATH charms to soothe the savage breast and also kill the pain of the dentist's drill.

A team of researchers has found that toned-down stereophonic sound is an effective pain killer for many dental patients, particularly children.

This is how Dr. Wallace J. Gardner, dentist, and Dr. J. C. R. Licklider, psychologist, Cambridge, Mass., put this discovery to work:

They constructed what they call the Audio Analgesiac. The device includes earphones that can bring music or a roaring sound like Niagara Falls to both the patient and the dentist. The patient can select whichever he prefers and also control the volume.

They tried the machine on 387 patients who had always required a local anesthetic or gas. Each patient had some amount of grinding, cavity filling or scaling work done.

The Audio Analgesiac, used alone, proved completely effective in 63% of these patients, the team reports in the *Journal of the American Dental Association* (59, 1144, Dec. 1959).

Although the analgesic effects were less than complete for 25%, no other anesthetic was needed. The treatment was not considered helpful to 12%.

Since then, the team has extracted 136 teeth with the aid of the Audio Analgesiac only. In every instance, the patient was aware of the pressure and pull. Moderate pain was reported in several instances, they admit. However, no patient regretted the use of this method and none suffered severe pain. In fact, one patient had four teeth extracted during one sitting, they say.

Children were treated very successfully by this method. Music, selected especially for them, tended to occupy their full attention. Other advantages pointed up by the team include: elimination of the waiting period for conventional anesthetics or analgesia to work; decrease in patient's tendency to get his tongue in the dentist's way; ability of the machine to drown the sound of the drill for both the patient and the dentist.

Explaining the method by which the music becomes effective, they said, "both the music and the noise produce a diversion of attention from the dental operation. It

is well known that fixing the attention on something else can to some extent reduce the pain caused by an injury." Furthermore, the patient ordinarily feels he has no control over what happens to him in the chair. That the patient is given control over the selection of music or masking sound and volume appears to be important.

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## CHEMISTRY

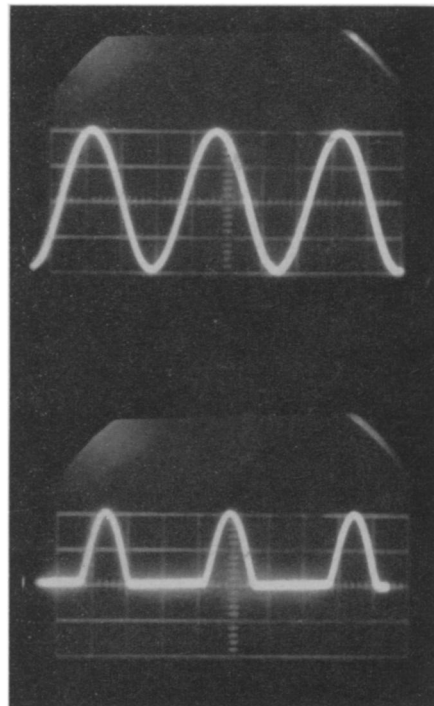
# Low-Melting Elements Make High Heat Material

TWO CHEMICAL elements, both of which will melt in the sun on a hot day, have been combined to produce a material capable of withstanding temperatures up to 1,500 degrees Fahrenheit.

Gallium phosphide, a yellow compound resembling ground glass, has been prepared from gallium, a rare silvery metal, costing about \$1,500 a pound, and phosphorus, used in matches, by the U.S. Army Signal Corps Research and Development Division, Fort Monmouth, N. J.

The material may be used in building solar-cell power plants for space stations, and tiny rugged electronic parts for missiles, satellites and space probes of the future. So far the Army Signal Corps has built an electronic diode of gallium phosphide which has withstood temperatures seven times higher than those withstood by the now-used silicon and germanium.

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**TUBE WORKING**—The heat-resistant ability of gallium phosphide may make it useful as an electronic diode under intense heat. On top is shown normal alternating current cycles while bottom view shows how tube flattens the lower half to change it to direct current pulses.