MEDICINE

Headache Remedy Believed Cause of New Fatal Disease

Pyramidon and Related Medicines Poison Bone Marrow, Causing Drop in Number of White Blood Cells

THE CAUSE of a new, fatal disease has probably been found in amidopyrine, better known as pyramidon, widely used remedy for headaches and for relieving pain in such other conditions as sciatica and arthritis.

Pyramidon and a group of chemically related medicines also used to relieve pain seem to poison the bone marrow where some of the blood cells are formed, causing agranulopenia.

This disease has a number of aliases by which it is known to medical scientists: agranulocytic angina, agranulocytosis, malignant leukopenia, granulocytopenia, and malignant neuropenia. It starts suddenly with fever and sore throat. Some of the patients thought they were getting a cold. Ulcers appear on tonsils, tongue, gums and elsewhere, spreading rapidly. Most striking, however, is the drop in the number of white blood cells from a normal of 6,000 or 7,000 per cubic millimeter of blood to 2,000 or less. The number of red blood cells and the amount of hemoglobin, meanwhile, remain normal. Most of the patients die in spite of treatment.

Discovered By Germans

The disease was first observed by a group of German scientists in 1922. But the connection between the medicine and the disease has only just been observed.

No cause for agranulopenia had been found up to last year. Then Drs. F. W. Madison and T. L. Squier of Milwaukee, mulling over the situation, realized that the increase in number of cases of agranulopenia paralleled the increase in use of pyramidon with other drugs containing a barbiturate, such as luminal. They studied the records of thirteen consecutive cases and found that all the patients had been taking one or more of these drugs over varying periods of time before the onset of the disease.

They tried giving doses of the medicine to rabbits, and one animal developed the characteristic drop in white blood cells, while three others showed characteristic changes in bone marrow.

Previously, in 1931, Dr. R. R. Kracke of Emory University, had pointed out a possible connection between the use of coal tar derivatives and attacks of agranulocytosis. He reported in the next year that 8 out of 9 patients having this disease had been taking drugs containing the chemical group known as the benzene ring.

Both pyramidon and the barbiturates contain this chemical group. Benzene itself has been responsible for poisoning cases in industry. Some persons seem more susceptible to it than others, and investigators of agranulopenia, suggest that in this disease also individual susceptibility or idiosyncrasy may play a part.

Over 50 cases of agranulopenia, developing in patients who had previously taken pyramidon with or without one of the barbiturates, modern sleeping and pain-relieving powders of the veronal and luminal group, have been reported by Drs. C. H. Watkins and P. S. Hench of Rochester, Minn., Samuel B. Grant of St. Louis, Johnson McGuire of Cincinnati, Clyde L. Randall of Kansas City, Mo., and Arthur M. Hoffman, E. M. Butt and N. G. Hickey of Los Angeles.

The use of pyramidon either alone or in combination with other drugs, should be restricted to patients having white blood cell counts made several times a week, warn the Los Angeles investigators, Drs. Hoffman, Butt and Hickey, in their report to the *Journal of the American Medical Association.*

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PHYSIOLOGY

Muscle Tone Drives Blood In Veins Back To Heart

THE TONE of your muscles is what drives the blood in your veins back to your heart. The poor circulation that may follow an attack of influenza or a surgical operation is due to the fact that the disease or the shock of the operation has lessened the muscle tone.

This new explanation for what has long remained a scientific mystery was offered by Drs. Yandell Henderson, A. W. Oughterson, L. A. Greenberg and C. P. Searle of Yale University at the meeting of the National Academy of Sciences.

The circulation of blood through the body is under the control of the heart and the vasomotor system which presides over the contraction and expansion of the walls of the blood vessels. Dr. Henderson has long believed that in addition to these two mechanisms there must be a third factor responsible for sending the blood back into the heart. Today he announced that he and his associates believe they have found this factor to be muscle tone. Their theory reverses the idea that poor muscle tone was due to poor circulation.

Muscle tone itself is controlled from the central nervous system and considerably influenced by the breathing center, Prof. Henderson said.

The left side of the heart provides the force that drives the blood into the blood vessels in the muscles, he explained. If the muscles have tone a part of this force is taken up by their elasticity and presses the blood on into the veins and on through them into the veins leading to the right side of the heart. But in the absence of muscle tone, the entire force of pressure in the arteries carrying blood from the heart is lost in the flaccid tissues and the blood stagnates there instead of flowing on back to the right side of the heart.

Heart is Body's Sun

"These mechanical relations are best understood by comparing them to the circulation of water in the atmosphere," he continued.

"The sun by its heat lifts water from the sea into the clouds. It supplies the energy, as the heart does in pumping blood from the low pressure in the veins up to the high pressure in the arteries. Meteorological conditions deter-

mine where rain shall fall, much as the vasomotor system controls the distribution of the arterial blood to the various organs. If the rain falls on mountains or a high plateau the water runs back to the sea with a force that can be used to turn mill wheels or produce hydroelectric power. Such streams from high levels are analogous to the venous blood streams from muscles in good tone.

Sluggish Streams

"If on the contrary the rain falls on a swamp at sea level or other low ground the stream back to the sea is sluggish. Similarly when the tone of all the muscles in the body is low the venous stream to the heart is sluggish. And because of the diminished venous supply to the heart the volume pumped by the heart into the arteries is diminished and the entire circulation is depressed.

"It is not merely by positive pressure that muscle tone promotes the flow of blood to the right heart. The negative pressure in the chest, which draws the venous stream toward the heart, likewise varies with the tone of the thoracic muscles. After surgical operations and anesthesia involving even a slight degree of depression of vitality, or shock, the tone of the diaphragm is decreased, and because of the relaxation of this muscle the so-called vital capacity of the lungs is diminished. In cases of considerable depression a partial atelectasis, or even a massive collapse of the lung, may develop. This relaxation of the diaphragm, established by X-ray observations, first suggested to us the relation of muscle tone to the circulation."

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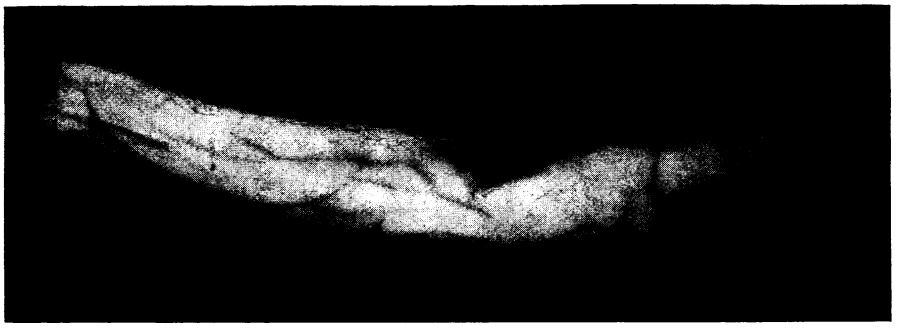
PHOTOGRAPHY—MEDICINE

Infrared Photographs Aid in Diagnosis

PHOTOGRAPHS taken through the skin by means of the invisible infrared rays of the spectrum are now helping physicians to detect varicose veins and obstructed veins. They are expected to prove even more valuable in determining the success of treatment in these conditions.

Examples of this type of photography were displayed by the Eastman Kodak Company at the meeting of the Western New York Society of Radiographers.

Pictures taken with photographic plates not sensitive to infrared rays show the skin approximately as the eye sees it. But when infrared-sensitive plates are used, a very distinct pattern of the veins under the skin appears in the finished picture. On this type of photograph physicians can see varicose veins or obstructed veins, when they are present, and can watch directly the effect of treatment by taking more of these infared photographs during the course of treatment.



LOOKING BELOW THE SKIN

Infrared light photography, which has formerly served the navigator by piercing fog, now aids the physician in diagnosing ailments of the veins and other blood vessels below the surface of the human skin. The skin is somewhat transparent to infrared rays, but the flesh beneath reflects them in greater intensity where there are no blood vessels than where these are present. No diseased condition is present in the arm shown.

The results with infrared-sensitive photographic plates are due to the fact that the skin is somewhat transparent to these rays. As they penetrate the skin and the tissues just beneath it, they become scattered and are reflected back to be picked up by the lens of the camera. Where there are blood vessels just below the skin, near the surface, the intensity of the rays reflected back is less than in the parts where there are no blood vessels. The superficial veins, therefore, show up in contrast to the rest of the flesh, looking on the finished picture as if they had been traced with a heavy pencil.

The infrared-sensitive photographic plates now being used in medical diagnosis have previously been used to take pictures in darkness, at great distances (331 miles), for important astronomical observations, and is used in the "fog navigation camera" aboard the Steamship Manhattan.

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PALEONTOLOGY

Fossils of Shark Found In Pennsylvania Rocks

SHARKS SWAM in fresh water near the site of Philadelphia, back in the days of the dinosaurs. That these usually salt-water fish should have lived in a habitat commonly thought of as alien to them is not really paradoxical, however, Dr. William L. Bryant, director of the Park Museum in Providence, R. I., told the American Philosophical Society. Sharks and their relatives ascend rivers far from the sea; and there is a fresh-water shark species still in existence in Lake Nicaragua.

These ancient Pennsylvania fresh-water sharks have been found in rocks that contain also the remains of an undoubted fresh-water fish of a higher order, and also fossils of land plants and dinosaur footprints. The formation belongs to the Triassic geologic period, of an antiquity estimated at approximately 180 million years.

At the same session, Prof. Glenn L. Jepsen of Princeton University told of a strange little fossil animal from the rocks of South Dakota, that lived in Oligocene times perhaps 50 million years ago, when the leading citizens of that region were the enormous rhinoceros-like Titanotheres. This small beast belongs to a mixed group of extinct mammals that have been classified sometimes with the lowest of the monkey-like animals, sometimes with the moles and shrews. As a result of its discovery it has been necessary to re-examine all the related fossils and rearrange their classification. This work involved extensive use of X-ray photography.

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