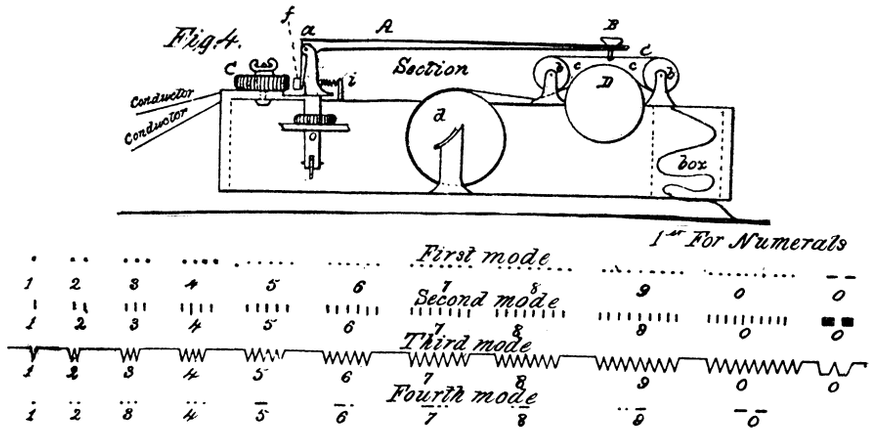


100 YEARS AGO—This is a reproduction of the drawings of the Morse telegraph and code, accompanying the patent specifications for the invention, showing tape for recording messages.

into the veins, however, is not lost in this way.

A surgeon's civilian experience with patients recovering from operations apparently cannot always serve as a guide to handling convalescence of war wounded or other patients suffering accidental injury. Patients chronically ill before an operation, the Montreal scientists found, are usually in negative nitrogen balance after operation but, unlike previously healthy men acutely injured, they can more readily be brought into positive balance by increasing the protein food in their diet.

Science News Letter, May 20, 1944

PHYSICS

Centennial of Telegraph

➤ TODAY the telegraph wires are eternally busy with orders for equipment and material. News of the birth of a son or word of a soldier's unexpected leave are sped on their way by telegraph. Hundreds of messages are sent simultaneously over one pair of wires.

But the first telegram ever sent between two cities was flashed in code between Washington and Baltimore just a hundred years ago. On May 24, 1844, Samuel F. B. Morse successfully sent the Biblical quotation, "What hath God wrought!" over the telegraph line strung from the chamber of the United States Supreme Court, then in the Capitol at Washington, to the Baltimore & Ohio Railroad station in Baltimore.

The idea of the electro-magnetic telegraph is believed to have been conceived while Morse was returning from Europe in 1832. In the dining salon of the packetship *Sully,* one evening, Dr. Charles T. Jackson of Boston was discussing new discoveries in electro-magnetism.

"If the presence of electricity can be made visible in any part of the circuit, I can see no reason why intelligence may not be transmitted instantaneously by electricity," Morse is reported to have remarked at that time.

During the twelve years that followed, artist-inventor Morse struggled to perfect his invention and to secure for it a proper presentation to the public. By September, 1837, work had progressed far enough for him to feel he could conduct an experiment for his friends.

Around his room at New York University, 1,700 feet of copper wire were stretched, the sending instrument being attached to one end and the receiving mechanism to the other. The signals, made by making and breaking the circuit, flashed instantly from one instrument to the other.

The first test of the electro-magnetic telegraph awoke the interest of Alfred Vail of Morristown, N. J., himself an excellent amateur mechanic, who thereafter became associated with Morse in his undertaking. Vail convinced his father, owner of the Speedwell Iron Works, of the value of Morse's idea. Judge Vail advanced money for the project and made shop facilities available.

The chief problem to the inventor seems not to have been to get a code of dots and dashes over the electric circuit, but to send it as exactly as possible and to get it into written form at the other end. For this purpose it was actually set up in a special kind of type at the sending instrument, and the jagged edges of the type run under the key so that the make-and-break of the current occurred with machine precision.

Most of the patent, dated June 20, 1840, is taken up with minute specifications for these outmoded accessories and for a now familiar recording device for the receiving instrument. The earliest telegraph instruments were provided with these devices, and the operators were themselves surprised to find that they soon learned the rhythmical dot-dash language so thoroughly that they translated as they listened, and the recording pen merely slowed up telegraphic communication.

Just before the end of the 1843 session, Congress acted favorably on a long-pending request for an appropriation of $30,000 to build an experimental telegraph line from Washington to Baltimore. Work was begun immediately.

The telegraph industry dates its beginning from May 24, 1844, when the wires had been extended to Baltimore, and a message was flashed for the first time from one city to another.

Science News Letter, May 20, 1944

MEDICINE

Streptococci Germs May Make Diphtheria Worse

➤ THE CURRENT increase in cases of malignant diphtheria which has been disturbing medical and health authorities may be due to the fact that streptococci germs are entering the picture to make matters worse.

Evidence that certain streptococci act as reinforcing allies of diphtheria germs, in what scientists term synergism, to cause greater havoc than the diphtheria germs can cause by themselves, was presented by Miss Elaine Updyke and Dr. Martin Frobisher, Jr., of the Johns Hopkins School of Hygiene and Public Health at the New York meeting of the Society of American Bacteriologists.

Working with strains of streptococci and diphtheria bacilli from the same fatal case of malignant diphtheria, these scientists found that all the mice they tested survived half a cubic centimeter of diphtheria germs with one-tenth a cubic centimeter of streptococci.

When, however, the dose of streptococci was doubled without increasing the number of diphtheria germs, four of six mice died in from one to four days.

Decreasing the dose of diphtheria germs from one-half to three-tenths of a cubic centimeter but using one-tenth of a cubic centimeter of streptococci, so that the proportion of streptococci was relatively higher than in the first experiment, killed five out of six mice in 18 hours.

Other experiments gave similar results showing that the two kinds of germs acted together to make the diphtheria infection much more malignant.

Science News Letter, May 20, 1944

MEDICINE

May Be Cause of Cancer

Evidence has been found in patients' excretions that gland disorder, particularly of the adrenals, may be responsible for cancer and leukemia also.

➤ PRODUCTION line trouble in the body's endocrine glands, particularly the adrenals, may cause both cancer and leukemia, cancer-like disease affecting the blood.

Fresh evidence for this comes from studies by Dr. Konrad Dobriner of Memorial Hospital and Col. C. P. Rhoads, director of the hospital who is now serving in the Army, and Dr. S. Lieberman, Dr. B. R. Hill and Dr. L. F. Fieser, of Harvard University. The studies were reported at the Atlantic City, N. J., meeting of the American Society for Clinical Investigation.

In the kidney excretions of patients with cancer these scientists have found chemical substances which are not found in the excretions from normal persons. They have also found marked differences in the amounts of certain hormone chemicals excreted by normal persons and by patients with cancer and leukemia. Instead of producing the chemicals they should be manufacturing, the glands in the cancer and leukemia patients are producing other, cancer-causing chemicals, the scientists think.

The glands involved may be the sex glands or the adrenal glands or both. Faulty function of the cortex of the adrenal glands is particularly suggested. This matches evidence against the same glands recently reported by Dr. James B. Murphy, of the Rockefeller Institute, who found he could prevent development of transplanted leukemia in rats by injections of adrenal cortical hormone.

Science News Letter, May 20, 1944

For Overactive Thyroids

➤ SUCCESSFUL results, which may turn out to be permanent cures, are being obtained with a new medical treatment for patients with goiters from overactive thyroid glands. The results in 33 cases were reported by Dr. E. B. Astwood, of Harvard Medical School, at the meeting.

Thiouracil is the medicine that is getting these patients back to health, even causing the protruding eyes that are a common symptom in this ailment to return to normal, without operation to remove the overactive gland in the neck. First reports of use of this medicine suggested that the patients would have to take daily doses all their lives to keep their overactive thyroids under control. Now it appears that this may not be necessary.

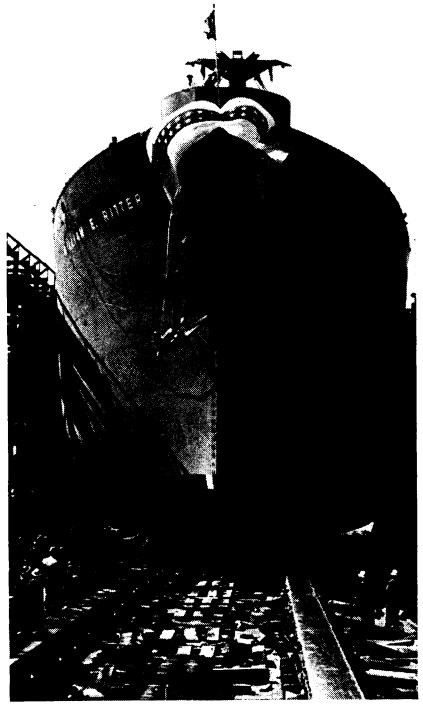
In nine cases the daily doses of the medicine were discontinued after six to eight months. So far, two to eight months later, there has been no sign of a return of the disease.

Thiouracil treatment developed, paradoxically, from studies of substances that caused goiters. A great many such substances have been found in the past 40 years, but it was only three years ago that goiter-causing substances were discovered which did not have their action checked by extra doses of iodine. Iodine is a strategic material in the gland's manufacture of its hormone, thyroxin, which is rich in iodine.

The substances which could cause the gland to enlarge in spite of extra amounts of iodine, it was subsequently found, were not stimulating but checking its function of hormone production. The enlargement was compensatory in nature. Patients with the kind of goiter in which popping eyes, extreme nervousness and thinness are symptoms have glands which produce too much hormone.

Sulfaguanidine, rape seed, allylthiourea (which may be a component of rape seed) and phenylthiourea were the first of these anti-thyroid substances discovered. A search for more active ones, in which 100 chemicals were tested, led to thiouracil. No better substance has yet been found, though the search has continued.

Science News Letter, May 20, 1944



DOWN THE WAYS—The Liberty ship SS William E. Ritter starts on its way to help smash the axis.

Stop Salt Loss

➤ SOLDIERS working and fighting in the tropics may not need to take salt tablets after one or two weeks when they have become acclimated, if they are eating an average diet, it appears from studies reported by Dr. Jerome W. Conn, of the University of Michigan Medical School. Dr. Conn's studies were done under contract with the Office of Scientific Research and Development.

Until they have become acclimatized, Dr. Conn emphasized, men doing hard work in the tropics do need extra salt. After acclimatization, they are adequately protected against salt depletion when they eat an average diet containing about one-half ounce (15 grams) of salt daily. They are even able to compensate for the sudden withdrawal of a large part of their average salt intake when such a situation is forced upon them, as might be the case if supplies were delayed.