

is already being used in experimental treatment of patients with softening of the bones such as in osteoporosis.

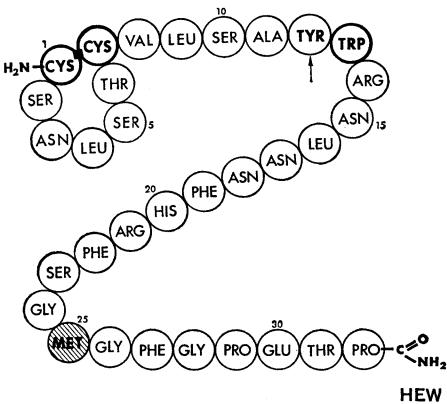
Small amounts of the highly purified hormone thyrocalcitonin have maintained normal blood calcium levels for five months in a patient with widespread parathyroid gland cancer. His damaged bones have healed under treatment at the Clinical Center of the National Institutes of Health at Bethesda, Md.

To produce one pound of natural calcitonin would require the thyroid glands of 60 million pigs, and would cost \$20 million. Chemical synthesis will be much cheaper.

The hormone was synthesized by two Swiss pharmaceutical companies—Sandoz and Ciba—and by Lederle in Pearl River, N.Y.

Studies at the National Heart Institute that led to isolation of the pure hormone also characterized the protein nature of the substance, reports Dr. John T. Potts Jr. of the institute's laboratory of molecular diseases.

He told the International Symposium on Protein and Polypeptide Hormones in Liege, Belgium, that he and



Amino acid sequence of calcitonin.

his team found the hormone was a peptide consisting of 32 amino acids, arranged in a single polypeptide chain with a large loop at the end.

Now that laboratory synthesis of the hormone has been accomplished, ultimate proof of the correct structure is provided. The scientists not only provided the first chemical definition of the hormone's structure, but developed a method of measuring the minute amounts of hormone circulating in the blood—less than one ten-millionth of an ounce per pint.

TRANSPLANT

Rejection antigen found

Hope for overcoming the rejection problem in transplanted organs has been raised by two scientists from the National Institutes of Health, who have

isolated a human transplantation antigen during research in Turin, Italy.

Working with Prof. Ruggero Cappelini, who directs an Italian institute of medical genetics, Drs. Barry Kahan and Ralph Reisfeld of the National Institute of Allergy and Infectious Diseases in Bethesda, Md., have tested what they believe is one of the important transplantation antigens in man. The antigen is a protein that arouses an immune response.

They had previously worked with inbred strains of guinea pigs from which they isolated their antigen. They expect to do a great deal more research with animal models before applying the isolated chemical in any widespread fashion to humans.

In their six-week stay in Turin, they tested its activity on six volunteers from whom spleens had been removed for medical reasons. They made a dilute solution of spleen lymphocytes, a type of white blood cells, then treated it with ultrasound to dislodge the antigen from the cell surface.

Next they concentrated the fluid and separated it into various proteins. By sensitivity testing on the volunteers, they identified one protein fraction as the important one.

Dr. Reisfeld believes that further experimentation will prove that with use of the antigen transplants can be retained, and at the same time the recipient will not lay himself open to infection.

Dr. Reisfeld explains that they are trying to "achieve a low dosage range of tolerance for getting a person's system accustomed to the antigen" so that if he receives a transplant from another person he will not slough off. The experimenters have been giving their antigen in small amounts repeatedly to the Italian volunteers, but they are not planning further human tests at present.

Tissue compatibility is under genetic control, and the NIH researchers are interested in putting transplantation on a definite chemical and genetic basis.

Dr. James V. Neel, chairman of the department of human genetics, University of Michigan, says that the quest for understanding of transplantation antigens is widespread, and that the NIH work "may be a great step to practical use in cardiac transplants."

Meanwhile the number of heart transplants had risen to 17 as of May 26. On Saturday night, May 25, Dr. Richard R. Lower (SN: 1/20, p. 59) with Dr. David M. Hume of the Medical College of Virginia, Richmond, performed the 16th heart transplant. The next day in São Paulo, Brazil, a team headed by Dr. Euryclides de Jesus Serbini of the Hospital das Clinicas, performed the 17th, the first in Latin America.

FAULTY RECORDER

Optical pulsar questioned

Pulsars have been a puzzle since their discovery; each bit of data that has accumulated on them has deepened their mystery—especially the apparent ability of at least one to send out pulses of visible light as well as radio waves (SN: 6/1, p. 519).

But now astronomers have to wonder if the light pulses exist after all. The variations in light output were observed at two institutions—and now one of them admits that its data result, not from the pulsar's activity in the heavens, but from a faulty tape recorder on earth.

Astronomers using the 120-inch telescope at Lick Observatory at first had thought they had confirmation of the optical variations found at Kitt Peak National Observatory. But last week they traced them to spurious electronic signals introduced by Lick's equipment.

Dr. David Cudaback of the University of California at Berkeley, who leads the Lick team, says he will be spending his time until mid-June trying to improve the tape recording system to eliminate the error and prepare for another try.

After the Memorial Day weekend, mid-June will be the earliest opportunity for making new observations of Pulsar One, since moonlight will mask the faint signals—if there are any—until then.

Dr. Jerome Christian of Mt. Wilson and Palomar Observatories says there is a good possibility that the data taken with the 200-inch Hale telescope, which so far has not shown any fluctuations, will be reanalyzed using the same computer on which the Lick data were reduced. This will not happen, however, until after Dr. Cudaback and his co-workers have corrected the recording problem.

Some of the scientists whose theories concerning the remarkable regularity of the pulsar's radio emissions cannot be altered to take in optical variations are now even more hopeful that the identification of the object is wrong or that the reported light pulses are not real.

Even though the astronomers at Kitt Peak have confirmed their own observations of the optical pulses with the 84-inch telescope, few scientists will be convinced of the reality of the light variations until there is confirmation from another observatory.

Among those who adopted a wait and see attitude even before the Lick confirmation was retracted is Dr. Geoffrey Burbidge, now a visiting astrophysicist at Harvard College Observatory. However, he notes that if the light

variations do turn out to be real, none of the theories proposed for the radio pulses account for them. All would have to be discarded.

Dr. Burbidge foresees that "ideas a year from now concerning pulsars will be totally different than they are this month."

Dr. Jesse L. Greenstein of California Institute of Technology suggests that the regions that perhaps radiate light from pulsars are not the same as those sending out radio waves, with high density regions emitting light and low density ones, radio. He also believes the optical identification of CP 1919 must have further confirmation, a statement made before the Lick data were found erroneous.

Any successful theory will have to explain not only an energy source radiating over the wide range from radio waves to light—if the light pulses are real—but also the repetition rate, so highly precise that it can be used to keep time (SN: 3/16, p. 255).

Scientists at the Naval Research Laboratory are planning this month to use the pulses from CP 1919 to check Einstein's theory of general relativity. With their 85-foot radio telescope, they will

search for a Doppler effect involving the orbital motion of the earth and the gravitational field of the sun.

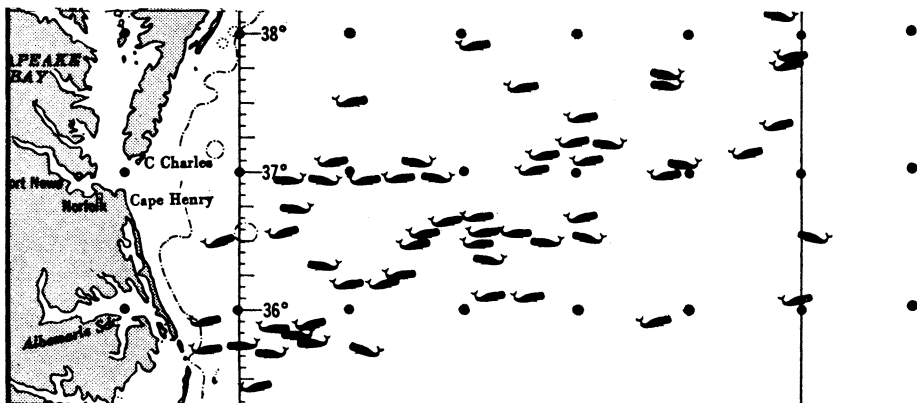
According to relativity theory, when the earth penetrates most deeply into the solar gravitational field, in January, terrestrial clocks slow down, compared to their rate in June when farthest from the sun. The June measurements, expected to be taken over a 10-day period, will be repeated next January, the difference to be recorded amounting to about one part in a billion.

Since the pulsar variations can be measured with an accuracy of one part in a 100 million during a 10-day interval, the pulsar clock beyond the solar system could be used to check whether or not terrestrial atomic clocks show a frequency shift. A slow-down at perihelion of about two parts in a billion is predicted by Dr. Banesh Hoffmann of City University of New York's Queen's College in the May 18 NATURE.

In all the observations of pulsar's now going forward one thing is certain: The researchers, having seen the results of precipitous reporting of data from the Lick experiments, will certainly hold up their results until they can be checked and double-checked.

THAR SHE BLOWS

Learning what the whalers knew



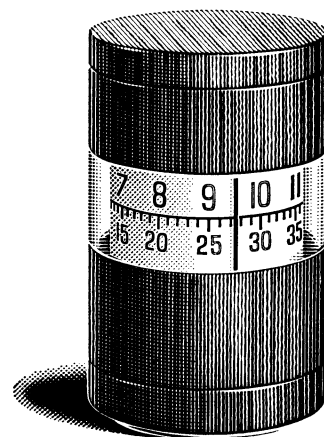
Aerial surveys find whales congregating in the Southern Ground.

Seventeenth and eighteenth century whaling captains used to frequent a section of the North Atlantic known as the Southern Ground, where, they believed, whales were more numerous than in other parts of the ocean. The region extended roughly from Philadelphia to Cape Hatteras and from the United States coast east to about 60 degrees west longitude. It was especially popular because of its proximity to New England ports.

It's no ancient mariner's tale, says the U.S. Naval Oceanographic Office. Aerial surveys show that there are in-

deed more whales in this area, especially the western portion of it, than elsewhere. Over 200 hours of aerial surveys have been flown since 1966. Of the 132 whales observed, over 90 percent were in the western part of the Gulf Stream, which flows through the old Southern Ground.

Oceanographers are now trying to find out why the whales congregate in the Gulf Stream. As they gather more data, they are trying to correlate the number of whales with data on environmental factors that might plausibly affect their behavior.



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