

"For progress in any direction, it is necessary to establish a system free from war or the threat of war, and free from tyranny and oppression anywhere. For civilization to advance to its highest peak, that progress must not be hampered by national boundaries which cut the bonds of cooperation, intellectual as well as material. At the end of this war we will have the greatest opportunity in history to organize the world along sound scientific lines which will make possible a just and permanent peace. Our generation thus has before it the most difficult task and the most thrilling challenge ever to face mankind. If we fail, humanity will be doomed; but if we succeed, as we will, we shall usher in an era of prosperity beyond our wildest dreams. For man will conquer nature by conquering himself."—From the essay of Ray Schiff.

star, suddenly appeared in a southern constellation. Its explosive rise to first magnitude glory was followed by a rapid decline. Many kinds of observations were immediately needed. Nova Puppis, as it is called, needed to be watched carefully, and continuously measured as it wavered in light, because analysis of the explosion could much increase our scanty knowledge of exploding stars and their consequence in the general problem of the setup and operation of the stellar universe.

The nova was first reported to us by radiogram from the Argentine. A little later, in a roundabout way, a telegraphic report came in from southern Germany. The new exploding star was independently found also by a cook on a mountain in California, by a keen-eyed observer in southern Canada, although the new star was just barely visible before dawn from his far northern location. It was also discovered by a worker in a New York factory, while he waited for the train to take him to his early morning work.

From the Harvard Observatory we announced telegraphically to as much of the world as we could reach the appearance of the exploding star and within two weeks we had accurate observations from half a dozen countries. The analyzing spectroscopes of the great American observatories closely followed the fading star as it changed from equality with our brightest naked eye stars to invisibility. A month after the discovery was announced there came to us in Cambridge, Massachusetts, numerous photo-

graphs and spectrograms of Nova Puppis made by a Greek astronomer in the Orange Free State in South Africa.

How clear it is that the stars are international.

The Northern Lights are studied in the United States, Canada, Russia, Sweden, and especially in Norway. The shooting stars, commonly called meteors, are the friction flashes of dust particles and small rock fragments flowing into our atmosphere from interplanetary space. They certainly are not *national* in any sense. They come, night and day, in all latitudes and longitudes; millions of millions strike the earth every day, although only a fragment are near enough or bright enough or swift enough to be seen, and then mostly at night.

Thus it appears that whether we are charting stars, chasing the solar eclipses, collecting meteors, or recording the variations of stars, sunspots, and Northern Lights, the astronomers are also friendly little brothers of the Sun. We are so readily in cooperation whenever any tough problem comes along that we wonder why all of the children of the ether waves, whatever their national affiliations, cannot overlook the trivialities and rise to the dignity of a world wide manhood.

*Science News Letter, March 13, 1943*

MEDICINE

### Physicians Need to Know How the Viruses Grow

By DR. ELEANOR BLISS

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*Excerpt from address given before Science Talent Institute.*

➤ THE SULFONAMIDES are not effective against animal parasites; nor are they of any use against the viruses—except for two. This is too bad. We can get along with what we have in the way of antiprotozoal drugs but something is needed badly for virus diseases. The drugs are deficient too in respect to bacteria. There are two or three species which are insusceptible. This is trying to the doctor who wants to cure an infection caused by one of the recalcitrants but it adds zest to the study of the drugs. It would be dull if they were perfect. Look at how much more fun physicians are having pointing out the bad effects of the sulfonamides than in describing the cures! Aside from adding spice, however, the fact that there

are sulfonamide resistant bacteria is scientifically interesting.

The current concept of the mode of action of the sulfonamides is that they interfere with the action of certain bacterial enzymes—the digestive juices so to speak. So, if a bacterium is resistant, it must mean that it has a different enzyme setup from the other, susceptible, bacteria. I believe that the same hypothesis serves to explain why these drugs are ineffective against animal parasites and viruses—these germs grow by means of mechanisms which are quite different from those by which bacteria grow. If we could find out what that difference is—and we already have a good deal of information about bacterial metabolism—if we could find out how viruses grow, we could perhaps devise a chemical which would be to them what sulfanilamide is to bacteria.

That is a problem which will probably still be waiting for you when you have your PhDs and MDs. If I've made it sound simple don't believe me. It's a honey.

*Science News Letter, March 13, 1943*

MEDICINE

### Cancer Cells Marked By Uncontrolled Growth

By WARREN H. LEWIS

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*Excerpt from address made before Science Talent Institute.*

➤ THE MOST important characteristic of cancer cells is their uncontrolled growth in the body. All normal cells are subject to rigid control throughout life. The unknown mechanism which keeps normal cells of different types from multiplying beyond their proper limits seems to have no effect on cancer cells. They behave like new species of cells for which there is no control mechanism.

Here at the very beginning we encounter a great fundamental phenomenon, still unsolved, yet this control mechanism extends throughout the entire realm of biology and is of the utmost importance for the understanding of the behavior of cancer cells.

It may be secretions something like the hormones, which have so much control over the reproductive system, are given off by the metabolic activities of many other types of cells and have something to do with the maintenance of the proper size of the various organs and tissues of the body.

*Science News Letter, March 13, 1943*