field and ultraviolet radiation during its flight from earth.

Veneras 4, 5 and 6 were apparently disabled before they reached the surface. Venera 7 lasted 23 minutes on Dec. 15, 1970, during which time it transmitted data that Soviet scientists interpret as indicating a surface temperature of 475 degrees C. and an atmospheric pressure 90 times that of the earth. Venera 8 contributed about 50 more minutes of surface time on July 22, 1972, generally confirmed its predecessor's temperature and pressure readings and added the finding of surface rock containing slightly higher amounts of uranium, thorium and potassium than earthly crustal basalt.

The United States has never tried a Venus landing. Mariners 2, 5 and 10 flew by the planet, with Mariner 10 providing striking ultraviolet imagery of Venusian cloud structure. But not even the exotic Pioneer Venus mission being readied for 1978 is planned to produce a soft landing. Pioneer Venus will include one spacecraft that orbits the planet, while a "carrier" probe will send three smaller craft (plus itself) in through the atmosphere to take measurements all the way down to what the National Aeronautics and Space Administration calls a "nonsurvivable landing." □

Honoring Harlow for dedicated research

Harry Harlow's work is important, fruitful, imaginative, ingenious, valid, original, creative and outstanding. This praise and much more was heaped on Harlow last week, along with the International Kittay Award of $25,000. The award is presented annually to an "outstanding researcher in the field of mental health whose work represents a major contribution with practical clinical application."

Harlow, recently retired director of the primate research center at the University of Wisconsin, was honored for his 40 years of research on the learning and emotional responses of primates. He is probably best known for his studies of mother-child interactions. By raising infant monkeys with wire and terrycloth surrogate mothers, Harlow established mother love as a behavior based on the tactile or physical comfort of the offspring, rather than on feeding. Harlow's isolation studies demonstrated the necessity of maternal sensory stimulation of infants and the importance of play as part of the normal process of psychosocial growth. Isolation and lack of stimulation can lead to depression. Without play, infants do not learn sex roles and do not learn to control aggression.

Harlow's work, says Theodore Lidz of Yale University Medical School, is "of extreme significance for understanding those aspects of human behavior related to depression, aggression or sexual dysfunction, which originated in the formative years of mother-infant interaction." George Serban, medical director of the Kittay Foundation, says Harlow's work "freed clinical psychiatrists from existent speculative concepts and unverified assumptions concerning the mother-infant bond and the development of depression."

"We are, in effect," said Sol Kittay, "honoring Harlow for a lifetime of brilliant work and dedicated research." □

NRC backs most emission standards

The National Research Council, responding to a request for a quick summary of present scientific knowledge bearing on automobile emission standards, has issued a report supporting all but the standard for nitrogen oxides. The study is expected to weigh in upcoming Congressional discussions of revising the Clean Air Act.

The report concludes that emission standards for hydrocarbons and carbon monoxide for 1978 are "feasible and worthwhile" and should be "maintained at the current statutory levels" of 0.41 grams per mile and 3.4 grams per mile, respectively. The NRC also found "no evidence to justify relaxing the existing ambient air quality standards" for regulated pollutants, and recommended that some new standards, involving short-term concentrations of NO_x and ambient levels of sulfuric acid and acidic aerosols, could be added.

The report does state, however, that the current statutory NO_x emission standard (0.4 grams per mile by 1978) might discourage the development of alternative technologies, such as stratified charge engines. Members of the panel could not agree on what course should be taken, but agreed that if NO_x emission standards were relaxed, a two-tier system should be used to replace it, in which congested urban areas would have stricter standards. They also recommended establishment of a sulfuric acid emission standard. □

Coronal model for Cygnus X-1

More and more astrophysicists are beginning to agree that the X-ray source in the binary star system designated Cygnus X-1 is a disk of hot material surrounding a black hole. If it is that, it is the first astrophysical black hole to come under observation, and it is probably a paradigm for a whole class of objects.

The disk is supposed to be composed of hot matter drawn from the normal star that is the black hole's companion. It is pulled by the black hole's gravitation and is in the process of falling down the black hole. On the way it gives off a complex fluctuating spectrum of X-rays. Moreover, this spectrum has experienced two sharp major changes in appearance, and these sharp discontinuities are the sticking points for models of its structure.

An early model, the so-called Lightman-Eardley model, proposes that the disk is divided into two sections, an inner optically thin region near the black hole that is highly radiant and an outer optically thick region that is less radiant. It explains the first sudden discontinuity in the spectrum by proposing that the inner region suddenly expanded at the expense of the outer.

But now Cygnus X-1 has switched back to more or less what it was before. The Lightman-Eardley model cannot explain the switchback so well, says Edison P. Liang of the University of Utah, and he and colleague Richard Price have reached into solar physics to propose a coronal model that they think works better. Liang described it at the recent Symposium on Theoretical Principles in Astrophysics and Relativity held at the University of Chicago.

Liang and Price divide the disk like an Oreo cookie. The middle (which can be called the photodisk by analogy with the sun's photosphere) is dense and fairly cool (about one million to ten million degrees K.). The top and bottom layers are the corona, hot (a billion degrees K.) and tenuous and each ten times as deep as the photodisk. Energy to heat the corona is carried by acoustic waves. Liang and Price can figure it out plausibly, with only one open question: how turbulence in the disk relates to the acoustic waves.

The coronal model, Liang argues, can explain better the two most salient aspects of the spectrum: that X-rays seem to come from two regions of quite different temperature and the sudden sharp changes in over-all shape. The sharp changes depend on appearance and disappearance of the corona, and so the model takes care of reversals quite naturally. A corona can be a transient phenomenon, Liang insists. The sun was without a corona from 1645 to 1715 "so it is not just a fairy tale that it can be on or off." □