

Marmor or Money. Such individuals are "essentially bisexual," Marmor says. And if they are strongly motivated to change, "it's conceivable that some could give up homosexuality and become heterosexual." These homosexuals "always have heterosexual tendencies," Money says. "I know dozens of homosexuals who have managed to get into long-term heterosexual relationships without going to professionals."

Still, Money concedes, "no one can do sex research without sampling problems." He believes the basic difficulties with this and other studies go deeper, to the definition of homosexuality itself. "We've all fallen into the trap of defining a psycho-sexual problem as a sexual one," he says. "But when you get to know the patients, the key to the problem is not sex at all, but love." The totally, intensely homosexual person "is someone incapable of falling in love, except with someone with the same sex organs as himself or herself," he says. "I don't think Masters and Johnson addressed this problem—Are their so-called 'cured' homosexuals able to fall in love? You can't fall in love with a surrogate in two weeks," he says, referring to the use of sexual surrogates in the St. Louis treatment where opposite-sex partners (estranged wives or husbands or others) were not available to participate.

Masters and Johnson have acknowledged to reporters and in their book that their sample is relatively small and somewhat skewed by the motivation of their study subjects. "That's true," says Chris Busby, spokesperson for the Masters and Johnson Institute. "This is a very small and select population. This [the Masters and Johnson therapy] is not the be-all and end-all," says Busby. "They're not claiming to have any magic cure. The hope is that this research will open up more avenues so that homosexuals will be able to get more help in the future."

Such research, and the motivation behind it, is aimed at persons who are unhappy with their homosexuality and *want* to change. Many professionals view the rest of the homosexual population that is basically happy with its lifestyle simply as a minority that does not need to be altered for mental or physical health reasons. The American Psychiatric Association has not considered homosexuality an "illness" since 1973, when it officially removed the term from its Diagnostic and Statistical Manual of Mental Disorders. Today, the only reference to homosexuality found in the manual involves "ego-dystonic" homosexuality, where the individual is "profoundly unhappy" and wants to change.

The relatively normal sexual functioning of homosexuals is confirmed in another portion of the Masters and Johnson study. They found some, but few significant differences in the ability of homosexual and heterosexual couples to respond on a physical level to various sexual stimuli. While some researchers at the St.

Louis institute have suggested this finding disproves a stereotype that homosexuals are less functional than are heterosexuals, other scientists contend that no such stereotype has existed for years.

"That's no great surprise," says a West Coast sex researcher who says he has a policy of not being quoted by name. "Once the sexual machinery gets going, it goes." Adds Money: "No one ever expected it [the functioning of a homosexual's sex organs] to be different." But he says he believes that Masters and Johnson are basically measuring the "functioning of genitalia" and that the differences between homosexuals and others lie not so much in their response as in their "perceptions" of sexual stimuli. "If they're saying the psychological experiences [of homosexuals and others] are the same," says the West Coast psychiatrist, "then that's not true."

Nevertheless, researchers acknowledge that homosexuals are — like their heterosexual counterparts — subject to sexual dysfunction, including failure to reach orgasm, impotence and premature ejaculation. Masters and Johnson report that in still another aspect of their study — in which follow-up data *were* provided — they successfully treated all but 12 percent of 84 male and female homosexuals with sex performance problems. Masters and Johnson techniques, for homosexuals and heterosexuals alike, involve meshing physical manipulation with a psychological reorientation of the approach to sex.

Again, professionals observed that this is encouraging but not unexpected, since Masters and Johnson's sexual and psychotherapeutic techniques have worked for many motivated heterosexuals in the past. "What is laudable," says Marmor, "is the sense of [Masters and Johnson] doing an objective, scientific study in the sociology of homosexual behavior." And Money notes that although much of the new data on homosexuality are not unexpected, "it's rather good to have it documented." □

Summer cyclones on Mars

Among the fascinating aspects of the planet Mars are the patternings of its weather, climate and seasons, whose existence provides a familiar context in which to study an otherwise alien world. After looking at startlingly congruent graphs of the winds measured in 1976 during the Viking 1 lander's first two days on the Martian surface, for example, the mission's chief meteorologist noted that "if one of them were the Dow-Jones average and the other were my predictions, I'd be a wealthy man."

Few aspects of meteorology, of course, turn out so neatly, particularly on other planets, where the data are limited and much must be deduced, inferred or simply guessed at. On a global scale, there are the huge Martian dust storms, whose source regions and times of occurrence can by now be predicted to an extent, but the more regular types of large-scale circulation patterns such as cyclones still pose difficult problems. Viking's predecessor, Mariner 9, provided some evidence of baroclinic waves (pressure systems associated with cyclones) during the planet's late winter over the north polar region — one of the most meteorologically active parts of Mars — but the Viking 1 orbiter has now gone Mariner 9 one better by photographing a pair of summer cloud patterns that strongly resemble almost classically regular cyclones. The Viking orbiters were not designed primarily as weather satellites, and it was only because of their longevity that enough suitable observations were made possible to reveal such patterns. According to Garry E. Hunt of University College, London and Philip B. James of the University of Missouri, the pictures are "the first evidence that baroclinic waves, prevalent during other sea-

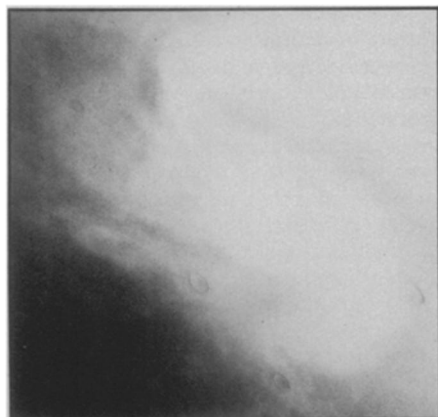


Relatively twice life size

Now Albert Einstein joins the residents of Washington's mall. In bronze he can commune with sculpted presidents and with his own predecessor in classical field theory, Joseph Henry. The memorial, in honor of Einstein's centennial, was dedicated by the National Academy of Sciences this week.



Viking 1 orbiter photographed these two apparent cyclones on Mars, first evidence for baroclinic waves in the north polar region's summer. Smaller, more northerly storm is at top.



sons, also occur in summer."

The first and most striking of the features was seen at 81°N (160° longitude), almost to the edge of the north polar cap. Infrared measurements showed a steep surface temperature gradient across the area, ranging from 237°K just to the south, to about 230°K directly beneath the presumed cyclone, to about 215°K to the north. "These are precisely the effects which are expected for such a system," the researchers report in *NATURE* (278:531), "since the waves which give rise to these disturbances occur in the polar front which separates the frigid arctic air from the warmer mid-latitude atmosphere." The characteristic spiral cloud formation, probably composed of water ice, seems to be about 4 km above the ground, with wind speeds of 31.5 meters per second at the cloud and an estimated 12.6 near the surface. Data are more limited for the second circulation pattern, which was located closer to the equator at 66°N (227° longitude). It too resembles water ice, with an altitude (calculated from ground shadows) of 6 to 7 km and wind speeds of 23.1 meters per second in the cloud and an estimated 9.2 near the ground.

There has also been evidence of baroclinic systems passing over the two Viking landers, whose meteorological instruments have both been operating for more than a 688-day Martian year, although the lander cameras have the wrong viewpoint to see such storms' actual shape. □

Something weird in the Milky Way

Many of the new objects discovered by astronomers in recent years cause astrophysicists a major worry: Where does their energy come from? Arguments over the best energy mechanism for quasars or Seyfert galaxies or various kinds of X-ray sources are a persistent feature of astronomical conferences. In the case of the newly prominent object SS433, questioning has tended to become at least for the moment a throwing up of hands.

SS433 is by its own testimony one of the oddest objects in the sky. It has "one of the strangest sets of astrophysical spectra ever observed," says Bruce Margon of the University of California at Los Angeles. Margon was speaking this week at a meeting of the American Physical Society in Washington, D.C.

SS433, as Margon recited its known history, was discovered and catalogued under that number more than a decade ago, but nothing out of the way was noticed then. Early last year, observers at the Anglo-Australian Observatory found an object with a remarkable spectrum that was then determined to be SS433. Coincidentally it was found to be a strong radio source (an unusual thing for the ordinary classes of star), and now the HEAO-1 satellite has found it as an X-ray source, though as Elihu Boldt of the Goddard Space Flight Center told the APS meeting, there seems to be nothing particularly unexpected so far about the X-ray spectrum.

The optical spectrum contains a number of strong emission lines, "enormous emission lines at unidentifiable wavelengths," as Margon puts it. The first approach of astrophysicists in such a case is to make the wavelengths identifiable by trying on the proposition that these are emissions of familiar atoms that have been Doppler-shifted to the red by motion in the source. Such an assumption is complicated by motions of the lines in SS433's spectrum: They change wavelength. Some

lines in the blues went through a change that would indicate an alteration of velocity by 3,500 kilometers per second in three nights of observing. Another line moves up and down the spectrum in three nights. If these are Doppler shifts, they would require a significant amount of mass to be accelerated at 1 gravity for 40 days and to move in opposite directions. This is astrophysically implausible.

So Margon and his collaborators, Holland Ford, Jonathan Katz, Roger Ulrich and Karen Kwitter of UCLA and R. P. S. Stone and Arnold Klemola of the Lick Observatory, thought up a number of "strange and bizarre" explanations that they presented at the Texas [sic] Symposium on Relativistic Astrophysics in Munich in December. Since then, SS433 has come out from behind the sun, and renewed observations have shown that the changes in the wavelengths of the emission lines come in cycles that last 160 days. Margon now essentially says to disregard Munich communication; the shifts are Doppler.

What it seems to be is a system of familiar emissions of hydrogen and helium in triplicate: Each line appears at essentially its rest wavelength, once blueshifted and once redshifted. The redshifts and blueshifts move back and forth in a correlated way. Such behavior is characteristic of the spectra of rotating objects, and so the first trial model was the most ordinary of these, a binary star system. Dynamically it doesn't work. It requires an object with 2 billion times the mass of the sun (one percent of the galaxy's mass). If a compact body with that mass were hanging around the edge of the galaxy, it would have been known before it was ever seen.

What Margon now favors is a single central rotating body spewing well-collimated streams of ionized gas in opposite directions, like, as he puts it, a double-ended rotating garden hose. The velocity of the stuff coming out of the hose is 80,000 kilometers per second, a quarter the velocity of light. For the central object some have suggested a black hole, but because of the dynamics and the temperature of the outflowing gas, Margon tends to favor a neutron star. But the luminosity of the object has to come to about 2,000 times the sun's, quite bright for an object of this sort. "Where does the energy come from?" he asks.

Continuing observations are obviously necessary. Margon reported some done at the Lick Observatory 12 hours before he spoke. They show that the Doppler shift movements have just turned another cycle. The more cycles that are recorded, the more readily will astronomers believe that there is a regular cycle and not some more complicated variation. At the same time, the International Astronomical Union, through the circulars that it sends every few days to observatories all over the world, appealed to astronomers who could give it some time to concentrate effort on SS433. □