

different academically has some very long-term consequences. ... And it's not just enough to succeed educationally, you need a personality that fits into the particular bureaucracy or company." Eventually companies and universities should change their entrance requirements, she says, but in the meantime more international schools, like Sophia, are needed to help the 3,000 Japanese students returning each year from abroad.

To gain a perspective on these diverse trends in Japanese psychology, SCIENCE NEWS interviewed Masaaki Kato, director of Japan's National Institute of Mental Health and a delegate to the World Health Organization. The East and West still have much to learn from each other, he says: Whereas the Westerners are relatively strictly trained even as small children, then given increasing freedom as they grow older, Japanese children begin in almost total freedom and find themselves most confined after they reach adulthood. An optimum pattern of training, he says, probably lies somewhere between these two extremes, with training reaching a peak after a relatively carefree childhood and before an adulthood of individual freedom.

The *amae* concept is an important contribution, he says, but he prefers the term "colaterality," coined by the late American anthropologist William Caudill. Kato says Takeo Doi developed his *amae* theories out of his experiences with Caudill in the United States, but that he emphasized the passive aspect of dependency. Colaterality, on the other hand, is the *mutual* dependency that close examination reveals in the relationship of mother and child. In Japan this mutual dependency can sometimes become too strong; in the West, it is more likely to be suppressed. Either extreme can cause emotional problems.

Kato expressed some chagrin over the state of the health care profession in Japan. Some 85 percent of the 1,500 psychiatric hospitals in Japan are private and run very commercially, he says. Only about one-third are what he would call "good." Although a government license is required to become a "mental health inspector" (recommendation by two such inspectors is required for involuntary hospital admission), there is no equivalent of board certification needed for any doctor to practice psychiatry.

Still, he says, Western psychologists can learn from the Japanese experience. He laughingly tells of describing the symptoms of *shinkeishitsu* to some Western colleagues, most of whom did not recognize it as a culture-bound neurosis, but tended to diagnose the disorder as schizophrenia or paranoid psychosis. He says Western therapists can also profit from studying Naikan and Morita therapies, with their emphasis on the patient's conscious level.

Thus, from the dialogue between East and West may emerge a fundamental new understanding of psychology. □

LETTERS

The ghost rides again

I would like to clear up some misconceptions evident in the letters of Ronald B. Gitchell (SN: 1/14/78, p. 19), Timothy P. Mann and Stanley R. Drake (SN: 2/11/78, p. 83) concerning the possibility of observing so-called "superluminal" velocities. Mr. Mann's remarks about the addition of relativistic velocities is correct up to a point. It is true that relative velocities cannot exceed c , the velocity of light, when two observers are involved; however, there could be a situation in which a "relative" velocity will be observed which is greater than c . Consider the following situation: Assume there are three observers, A, O and B situated such that relative to O, A is moving with speed $.8c$ to O's left and B is moving in the opposite direction (to O's right) with speed $.7c$. In this case the following obtains:

As observed by A, B's speed is $\sim .96c$, and likewise as observed by B, A's speed is also $\sim .96c$. This was stated correctly by both Mann and Drake. However, it is certainly true that as observed by O, A's speed of recession "relative" to B (and vice versa) is indeed $1.5c$; i.e. as observed by O, after t sec. A has traveled a distance $.8ct$ to the left and B has traveled a distance $.7ct$ to the right. In other words, O observes that a distance of $1.5ct$ has been traveled during a time of t sec. To reiterate, according to O, A and B are separating with a relative speed of $1.5c$. This is all measured in the rest frame of O and does not contradict relativity. On the other hand, A and B maintain correctly that each moves with a speed $\sim .96c$ relative to the other.

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The letters by Timothy Mann and Stanley Drake regarding the observed superluminal velocities of some quasars reflect on a widespread misinterpretation of the time speed paradox in the relativity theory, to wit:

If it is granted that one person (functioning as an observer) viewing a second person traveling at near light speed relative to him will see a slowing of time in the second person's universe, then it must also be granted that the same observation will of necessity be made by the second person observing the first (moving apparently at near light speed in the opposite direction) with an apparent slowing of time in the first person's universe, since all motion is relative and no observational point can be considered as primary or fixed.

Since the paradox appears identical to both observers, it follows that if they ever do connect at any single intersection point in space time, real time passage must be equal for them both, and the apparent relative time slowing effect in each observed universe will not occur. One cannot come back and meet one's great grandchildren. (This refers to situations involving pure velocity, allowing the acceleration effects of directional change and stopping required for the meeting of the two persons to be equal.)

The paradox becomes resolved as one considers that Einstein was referring to the observable universe only—that is, the optical image, rather than the unable-to-be-directly-observed material object itself. If this is allowed, then the theory expressed by Stanley Drake—that is, that while "relativity predicts that material ob-

jects themselves cannot go faster than the speed of light ... [but] ... the optical image can indeed go faster than the speed of light" is missing the point that relativity theory is actually predicting the characteristics of the optical image or the observable universe, leaving the "true" behavior of the material object itself unspecified. (Indeed, since the light waves of the optical image cannot travel faster than light waves can travel, the statement is self-contradictory.)

What will happen with the optical image, however, is that the apparent time speed in the observed universe will appear to slow down as the object moves away and to speed up as the object approaches as a result of the spreading out or bunching up of light waves from the object in the same manner as—and as a time equivalent of—the Doppler frequency shift. Considered in this manner, light speed appears as the terminal velocity in the observable universe precisely because light is the fastest known observational method possible, making this limit evident *a priori* when one defines how one actually observes.

Since this observational limitation does not apply to the viewing of two objects moving relative to one another in a plane perpendicular to the direction of observation of an observer distinct from the both, this would both explain the observed superluminal relative velocities observed in the quasars under discussion and would allow the terminal light speed concept to be removed from the sanctity of a quasi-religious doctrine to the more productive consideration of being a factor inherent in the observational limitations imposed by the relativistic spatial relationships of the system.

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I feel a word of support for Mr. Gitchell is needed. Admittedly, he can't speak of the velocity of an object "relative to the natural universe" if he wishes to retain relativity, but that doesn't mean he is ridiculous to look at it from a different viewpoint. Gitchell's observed velocity of separation is an absolute in his coordinate system which is anchored at the center of his natural universe.

The critics, Mann and Drake, seem to regard relativity as some sort of natural law which explains the way things are, whereas, in reality, it is merely an artifact of the way we observe ("see") and, instead of explaining the way things are, it merely explains the way we are constrained to perceive things to be.

If we could not perceive electromagnetic waves our universe would still obey Newtonian physics, but relativity would not exist.

Finally, Mr. Drake implies that we are studying quasars by reflecting light rays from them. This will be news to astronomers.

Robert E. McDaniel
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Stanley R. Drake has the right idea in his reply to Ronald B. Gitchell, but apparently has gotten lost in the conversion of km/sec. to km/hr, which results in the incorrect relative velocity of two cars going 100 km/hr in opposite directions. The speed of light is 299,792.2 km/sec. = 1079251920 km/hr the relative velocity is then:

$$\frac{100 + 100}{1 + \frac{(100)(100)}{1079251920^2}} = 199.99999999998283 \text{ km/hr}$$

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