

The Geritol universe: Tired light

It's beginning to seem as if astronomical redshifts aren't as reliable as they were thought to be. According to the expanding-universe hypothesis all the galaxies or all the clusters of galaxies are receding from all others. This recession means that the light from other galaxies we see should be shifted to the red end of the spectrum compared to what its appearance would be if the other galaxy were at rest with respect to us. The farther a galaxy is away, the greater should be the difference between its speed and ours, so the redder its light should be. If we can determine an unambiguous relation between distance and relative speed (and therefore redshift), we can learn much about the geometry of the universe.

But lately, things are beginning to seem not so simple. For several classes of objects, it seems that in different regions of sky different apparent redshift-distance relations exist. (If the class of objects is defined narrowly enough, they will all have about the same intrinsic brightness, and so distance can be estimated from the apparent brightness of each, independent of redshift.) At first this seemed to indicate a possible lopsided expansion, but now three astronomers at the Institut Henri Poincaré in Paris, Hiroshi Karoji, Laurent Nottale and Jean Pierre Vigier, say the

matter goes beyond that. Their latest results point toward a belief in the so-called "tired-light" hypothesis.

Their latest paper, which has been submitted to *ASTROPHYSICAL JOURNAL LETTERS*, deals with the apparent motion of faint radio galaxies (magnitudes 13.0 to 15.5). The observations show "an even more curious distribution" of redshifts than observations of other classes of objects. In summary they say, "Everything goes as if light emitted from distant sources is redshifted when it travels through clusters of galaxies.

"[This] evidently favors the existence of a 'tired-light' mechanism first discussed by Hubble and Tolman" in 1935 and recently taken up by some other observers. (It is called tired light because light loses energy when it is shifted toward the red.)

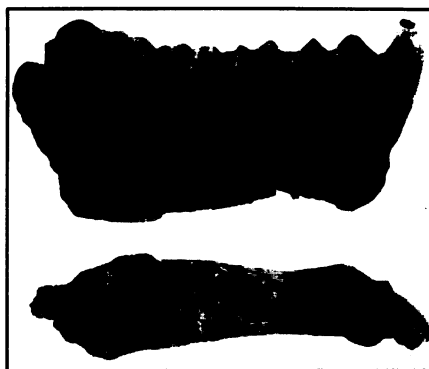
Tired light would be a totally new phenomenon in the behavior of light not foreseen in current theories of how a stream of photons behaves in a gravitational (or perhaps other kind of force) field. "If this is true," Vigier writes in a letter to *SCIENCE NEWS*, "the idea of universal expansion itself is in deep trouble, and one would have to come back . . . to the static cylindrical model proposed initially by Einstein himself." □

Human evolution: A Hungarian connection

Ramapithecus begat *Australopithecus*.
Australopithecus begat *Homo erectus*.
Homo erectus begat *Homo sapiens*. The 15-million-year story of human evolution once seemed so simple and straight-forward; but it's not. More and more fossils are being unearthed. Older finds are being reevaluated. And a growing body of evidence continues to suggest that we are a long way from discovering a single line that leads to the evolutionary development of *Homo sapiens*.

A good deal of theorizing on hominid evolution has been based on Indian and African finds, but, complains Miklós Kretzoi of Budapest, research has almost entirely neglected corresponding European materials. In the Oct. 16 *NATURE*, he attempts to fill in this gap by providing preliminary data on recently found materials from Hungary. Since 1967, researchers have been working at a very rich fossil site in the Rudabánya Mountains in northeastern Hungary. The finds include anthropoid material from 20 individuals, representing three different forms. One is a *Pliopithecus* species of great size. The other two are pongo or apelike-hominids: *Rudapithecus hungaricus* Kretzoi (1967) and *Bodvapiithecus altipalatus* Kretzoi (1974).

"The facial structure of *Rudapithecus*," says Kretzoi, "evinces a trend of



Jaw of *Rudapithecus hungaricus* Kretzoi.

hominization which indicates a straight line of evolution . . . towards *Homo*. This seems to make it probable that australopithecines represent a close side branch with their independent development (decrease in size of front teeth, enlargement of molars, and so on), in many respects surpassing *Homo sapiens*, but not fully achieving the *Homo* level of development.

On the basis of preliminary examination of the pongo-hominids of Rudabánya, Kretzoi draws several more conclusions. Hominization, he says, did not originate in certain isolated tropical gene pools, "but was an evolutionary trend covering the whole Afro-Eurasian faunal radiation

with its pongo-hominids." On the other hand, he continues, today's anthropoid apes achieved their present nonhuman phase and trend of evolution as a result of a more or less extreme forest-dwelling specialization developed in certain isolated, tropical forest areas in Central Africa and southeast Asia. Anthropoid evolution tending toward hominization, he concludes, "obviously developed on different levels, in numerous parallel, more or less 'human' branches which evolved so many parallel patterns during the process that it is not easy at present to find among them the single line which leads to the evolutionary development of *Homo sapiens*." □

Why is this woman crying?

"Woman kills self, son, husband," read a recent front-page newspaper headline. And if mental health statistics are correct, this phenomenon—suicide or attempted suicide by relatively young mothers—may become an increasingly common occurrence. Last week, at a conference sponsored by the National Association of Mental Health, data were presented confirming the fact that depression is the most widespread of human mental problems. As many as 8 million and perhaps 13 million people in the United States suffer from serious depression. And the victims of this depression are mainly women, by a ratio that may be higher than two to one.

But it isn't just the women who are victims. Myrna M. Weissman of Yale University's Depression Research Unit reported on the effects a woman's depression can have on her family. Weissman and her colleagues compared the families of acutely depressed and nondepressed women and found that depression impairs a woman's functioning as a mother.

Depressed women did not communicate as well with their children as did the others, and they showed less affection for their children. Some even developed feelings of hostility. The children, in turn, developed symptoms. They showed signs of hyperactivity, had trouble in school, got into more fights and were more accident-prone than were children of nondepressed women. These symptoms did not disappear when the mothers' depression subsided. The problems did improve with time but were still evident, in some cases, two years after the depressive episode.

The reasons for higher rates of depression among women are not completely clear. Physical, psychological and social (SN: 9/13/75, p. 173) factors may all be involved. What does seem clear, according to Weissman's results, is that "the depressed person lacks energy, is apathetic and needs care—hardly a state for caring for children." □