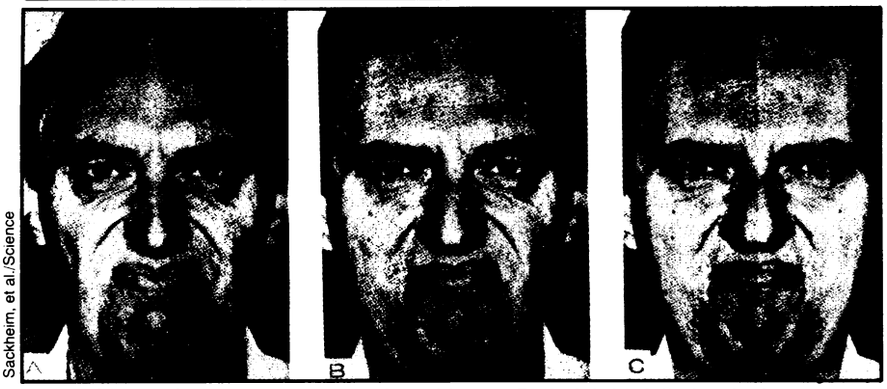
'Left face': The emotional side



Sackheim, et al./Science

Has this man's company just transferred him to Philadelphia? Or has he been named Bert Lance's public relations man? Whatever, there is a look of obvious disgust on his face — but which of the three faces is most disgusted?

According to the results of a University of Pennsylvania study, the left frame — a composite mirror image of the left side of his face — expresses the most disgust. In fact, the psychologists found that the left side of the face tends to convey more emotion in general than does the right side (right composite is at right and original face is in center).

Researchers Ruben C. Gur and Marcel C. Saucy of the University of Pennsylvania's psychology department and Harold A. Sackeim, now at Columbia University's psychology department, made up 70 such slides of 14 posers. They presented the frames to 86 subjects and asked them to rate each frame on a seven-point scale of intensity of expression. In addition to disgust, the emotions included happiness, surprise, fear, sadness and anger.

Left-side composites were judged more intense than right-side composites for 11 of the 14 posers. And of the 70 different faces, 45 were judged as expressing emotion more intensely on the left side, the researchers report in the Oct. 27 SCIENCE (they presented the report at the American Psychological Association annual meeting in August).

These results support evidence from previous studies suggesting right brain hemisphere specialization for the processing of emotional information, control over the left side of the face and superiority of facial recognition. "In light of these findings, our results point to greater right hemispheric involvement of the production of emotional expression," say the researchers.

However, one "puzzling implication" of the results occurs when people are face to face: "This creates a situation in which the side of the face which is more intense in emotional expression [the left side] is more likely to be projected to the hemisphere [left] which is relatively inferior in facial recognition and in the processing of emotional information." This may be either an advantage or disadvantage, they note, depending on the type of communication taking place. The researchers also suggest that greater emotional expressiveness may have evolved in the left side of the face "in order to compensate for the relative inferiority of the left hemisphere in facial recognition and the processing of emotional information." □

Taste buds in the making

Although the sense of taste is of extreme importance to Julia Child, Craig Claiborne and other gourmets and gourmands, it's not something a fetus would be concerned about, particularly since it gets its food through the umbilical cord, not its mouth. Right? Wrong. The fetus is busy acquiring an increasingly wide range of taste responses as it zips through development in the womb, according to Charlotte M. Mistretta and Robert M. Bradley of the University of Michigan at Ann Arbor.

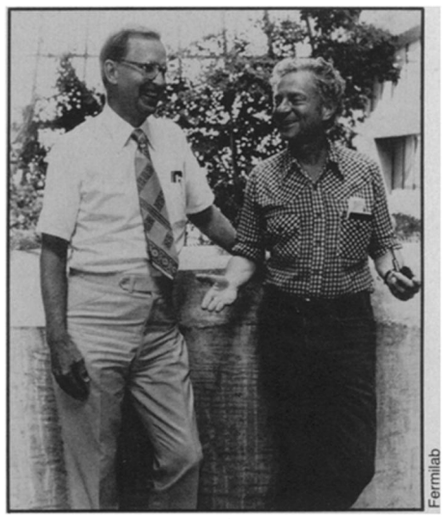
Several years ago, Mistretta and Bradley ascertained that taste buds appear on the mammalian tongue early in development, at about one-fifth of gestation in the human fetus and one-third of gestation in fetal sheep, and that fetal taste buds respond to chemical stimuli. Now Mistretta and Bradley have conducted an experiment to see whether taste buds in sheep fetuses alter their responses to chemicals during gestational development.

To record taste responses in fetal sheep of different gestational age, pregnant ewes were anesthetized, and the fetuses removed from their wombs. The fetuses, however, remained attached to their mothers' umbilical cords and were kept alive outside the womb for a few hours. During this time, the researchers flexed each fetus's head and secured it into a specially designed head bar. Microelectrodes that responded to chemical stimulation of taste buds were inserted into the neurons of its brain. Different salts and acids were then applied to the front of its tongue, and electrical responses of the taste neurons to these stimuli were recorded. For comparative purposes, taste neurons of lambs and adult sheep were also tested for their responses to the same chemical stimuli.

As the investigators report in the Nov. 3 SCIENCE, taste neurons in the fetus gradually increase their reactions to chemical stimuli during development, until they approach those of lambs and adult sheep. For instance, taste neurons in young fetuses usually respond to lingual stimulation with NH_4Cl, KCl and citric acid only; more neurons respond to HCl as development progresses, and sensitivity to NaCl and LiCl first appears in older fetuses. "Therefore," Mistretta and Bradley conclude, "taste responses seem to develop in a particular sequence, not randomly. These changes in the range of responsiveness may relate to maturation of taste receptor sites." Indeed, Mistretta and Bradley have found in the past that taste buds change in structure as gestation progresses.

These experiments, of course, do not prove that the fetus can taste in the womb under natural conditions. However, Mistretta and Bradley suspect that it might well be able to do so, since during the last third of gestation the fetus swallows large amounts of its liquid environment — the amniotic fluid. □

Lederman for Fermilab


Fermilab

Leon L. Lederman of Columbia University has been chosen as the next director of the Fermi National Accelerator Laboratory, according to a joint announcement by Norman F. Ramsey, president of Universities Research Association, and John M. Deutsch of the Department of Energy. Lederman is shown at right in the photo above. At left is Philip V. Livdahl, who has served as acting director of the laboratory since the resignation of the laboratory's first director, Robert R. Wilson. Wilson, who is now Peter B. Ritzma Professor at the University of Chicago, will continue to be active in the laboratory's affairs. □