of various mammals, including humans. But no one has ever measured its abundance in the brain.

Now melanin has been not only measured but even manipulated in the brain by Abba J. Kastin and his colleagues at the Veterans Administration Hospital and Tulane University School of Medicine in New Orleans. Kastin also speculates on what melanin might be doing there.

Kastin and his co-workers became interested in brain melanin because they had extensively studied the brain hormone that may control its synthesis—MSH (melanocyte-stimulating hormone). They decided to try to probe its presence in the brain using a relatively new technique called spectrophotofluormetric assay.

As they report in BRAIN RESEARCH BULLETIN (1:567), they have detected melanin in numerous areas of the rat brain, but particularly in the midbrain and pons medulla. Melanin was present in the brains of albino rats as well, and in comparable concentrations. No major change in the melanin concentration of the brains of any of these rats was observed after the rats were exposed to constant illumination or darkness. Nor did removal of various brain and body glands that make hormones—the pituitary, pineal, adrenals, thyroid, testes and ovaries—alter the level of melanin in the rodents' brains.

The researchers also tried giving rats daily injections of MSH for five weeks to see whether it might change their brain levels of melanin. The results of their first experiment were negative. They have since altered the experiment, however, and this time it looks as if MSH may have some effects.

None of these results proves that melanin has a role in the brain, of course, but Kastin believes that it is probably there for some purpose. Living organisms don't usually make chemicals they don't use, and melanin is present in the brains of albino as well as regular rats. Furthermore, Kastin and his colleagues have found that melanin injected into rats' bodies seems to get into their brains far more rapidly than one might expect.

What might melanin do for the brain? Kastin is still far from sure. However, other scientists' results, he says, suggest that brain melanin may be a source of highly reactive chemicals known as free radicals or that it may serve as a semiconductor for converting and storing energy as heat and deactivating potentially disruptive electronically excited molecules. Or the purpose, he hazards, may be some behavioral influence. Because he and his co-workers have found that injections of MSH can influence attention and learning (SN: 9/25/76, p. 207), they will now inject melanin into rats' brains to see whether it might have some behavioral effects as well.

"Eventually we should have more hypotheses that we can readily test," he concludes. □

Light monitors tissue temperature

Transmission of light through a tiny prism is the basis of a new temperature probe. The value of this unusual thermometer is that it can accurately measure tissue temperature, even when the tissue is being bombarded with electromagnetic radiation. Normal thermisters and thermocouples use metal wires and sensors that can act as antennas, allowing radiation to cause errors as large as a factor of 10 in temperature measurements. Far better accuracy is needed, especially in investigations of microwaves as a cancer treatment and as a surgical procedure and also in some industrial drying processes.

Douglas A. Christensen of the University of Utah described the new probe to the International Microwave Symposium in San Diego last week. The temperature sensor is a block of the semiconductor gallium arsenite, which Christensen polishes under a microscope to a prism shape 0.240 millimeters in diameter. The prism sits at the top of a bundle of optical fibers. When light of a specific wavelength shines through two of the fibers, it is reflected by the prism and transmitted along two other fibers. The amount of reflected light, detected by a photodiode outside the probe, indicates the temperature of the prism with accuracy of 0.2°C.

The amount of light absorbed by most semiconductors depends on the wavelength of the light and on the temperature of the material. Over a specific range of wavelengths, the light absorption by gallium arsenite drops steeply from 100 percent to about 10 percent. The wavelengths producing that sharp curve shift with temperature. By using light of a wavelength in the region of the shift, Christensen has monitored temperatures from 33° to 47°C.

Christensen with semiconductor sensor.

The only nonmetal temperature probe now commercially available uses a liquid crystal at the end of an optical fiber bundle. The newly developed sensor will be less expensive, much more stable and so small that it can be implanted through the tip of a hypodermic needle, Christensen explains. He expects to have a prototype sensor ready for manufacturing in about six months. □

Earliest diapsid reptile identified

The oldest ancestor of most modern and fossil reptiles has been identified as a slender, delicately limbed lizard about the size of an average iguana. *Petrolacosaurus kansensis* ("rock lizard"), which lived during the Late Pennsylvanian period (about 290 million years ago), is an evolutionary link, relating the ancestral stem reptiles and the dawn of diapsids. Diapsids include the overwhelming majority of living (three of the four orders) and extinct reptiles.

It is currently believed that all reptiles evolved ("stemmed") from a single group, the stem reptiles during the Pennsylvanian period. *Petrolacosaurus* seems to occupy a key evolutionary position, more advanced than the stem reptiles, but at the fountainhead of all diapsids.

As an evolutionary bridge, the 3-foot lizard was not only morphologically similar to the earliest-known diapsids, says Robert R. Reisz of the University of Toronto, it bore a sophisticated resemblance to the romeriids. These are members of the family Romeriidae and prominent representatives of the stem reptiles.

Consideration of the four- to five-pound lizard's anatomical structure leads Reisz to suggest that it belongs in the order Eosuchia, together with all the other early diapsids. The idea was originally proposed in 1952 by the late Frank E. Peabody, whose superb fossil specimens formed the basis of Reisz's research. The initial hypothesis, however, was not generally advocated for lack of favorable evidence, says Reisz in SCIENCE (196:1091).

Petrolacosaurus's skull is perforated—like the skulls of other early eosuchians but unlike those of romeriids—by several well-developed fenestrae. Some of the animal's other "post-romeriid" features, including elongated vertebrae, massive pelvic girdle, hollow ribs, long bones and metapodials, are also evident in Late Permian (225 million years ago) and even Triassic (180 to 225 million years ago) eosuchians.

Having decided this state of affairs, says Reisz, there still remains a problematic gap between *Petrolacosaurus* and the first emergence of a variety of eosuchians during the Late Permian. He believes this evolutionary hiatus is partially a consequence of an early diapsid environment unsuited for preserving fossil records. □

More news on page 15.