

BIOLOGY

Ozone splits red tide poison

Although New England shellfish have not been invaded by the dreaded red tide this year, scientists are exploring new defenses against the next wave of that sporadic plague on the seafood industry (SN: 8/2/75, p. 74). Direct confrontations with the poison-producing marine protozoa known as the red tide seem hopeless, according to John Hurst, director of Maine's Marine Resources Department biological laboratory. "It's like trying to bail out the ocean with a tablespoon," he says. But Hurst and Edward Gilfallen of Bowdoin College and Walter Blogoslawski of the National Marine Fisheries Service have demonstrated that the red tide poison can be removed from the shellfish after harvest.

Because all U.S. clams were safe to eat this year, the researchers collected their experimental specimens from a quarantined area on the coast of New Brunswick, Canada. They bubbled ozone through sea water to break up the poison in the clams. When toxin was extracted from the clams and injected into mice, the scientists found that the amount of poison had fallen more than 50 percent, so that the clams then met safety standards. Hurst emphasizes that it is not yet clear whether the ozone technique will have practical applications.

Dr. Smoglove or how I stopped worrying

Adaptation to smog may occur in as little as two days. In laboratory tests, volunteers were exposed daily for a few hours to ozone at a level less than the maximum concentrations around Los Angeles during summer smog episodes. Adverse reactions such as coughing, throat and chest soreness and small changes in lung function occurred only on the first two days of the four-day experiment. Other research by Jack D. Hackney and co-workers at the University of Southern California School of Medicine demonstrates that preexisting respiratory diseases correlate with greater sensitivity to ozone. Results from different laboratories suggest that asthmatic residents adapted to the Los Angeles smog may be only as sensitive as healthier non-Los Angeles subjects. "We don't know if this adaptation is beneficial or harmful," Hackney said at the meeting of the American Chemical Society in Chicago.

Hedgehog froth adds sting to the jab

Why use a naked arrow when an arrow head dipped in poison will do more harm? South American Indians realized the value of combined weapon technologies, and now biologists have discovered that hedgehogs do it too. The animals coat their spines with toad skin secretions and other substances to increase the pain inflicted.

For many years zoologists puzzled over a strange hedgehog occupation. The animals froth at the mouth and then lick their spines after contact with a variety of substances including tobacco, soap and toad skin. Edmund D. Brodie Jr. of Adelphi University has recently examined this behavior more thoroughly. He finds that intact toads, fresh or dried toad skins and the toad glands that contain high concentrations of skin toxins never fail to produce this self-annointing behavior. On the other hand, mice, bullfrogs and skinned toads are always eaten without any such ado. This behavior is innate and fully developed before a young hedgehog leaves the nest, Brodie reports in the Aug. 18 NATURE.

Brodie borrowed the arms of graduate students to round out his investigation. He wanted to know whether the annointed spines really have more sting. A jab with a spine coated simply with hedgehog saliva seldom produced reddening and never caused burning or pain beyond that of the mechanical puncture. Spines that the hedgehog had freshly annointed with toad skin secretions, however, invariably produced intense local burning and red splotches.

BEHAVIOR

Dreams and schizophrenia

Are schizophrenics merely overactive dreamers? In his search for the biological keys to schizophrenia, Boston psychiatrist Ernest Hartmann has described what he says are "clear psychological similarities between dreaming and acute schizophrenic episodes."

In a paper delivered at the recent World Congress of Psychiatry in Honolulu, Hartmann cites psychological behavior common to the two states, such as "surges of primitive emotion and lack of subtle emotion modulated by accompanying cognitive processing." Other similarities, he says, include the inability to stop an episode, lack of planning, lack of a continuing sense of self and the absence of the feeling of free will.

Hartmann suggests that there may be "physiological and chemical similarities perhaps underlying these psychological similarities" between dream sleep and schizophrenia. "D (dream) sleep and schizophrenia are both characterized by rough or poorly modulated feedback processes, demonstrated by poor habituation and poor homeostatic control of biological (and psychological) variables," says the psychiatrist. He hypothesizes that in both states the brain may not be producing enough norepinephrine, a hormone secreted by the adrenal medulla. In schizophrenia, production of the hormone may be blocked and replaced by an excess of dopamine, he says. In dream sleep, the mechanisms of storage or release of norepinephrine may be temporarily non-functional or under repair, Hartmann suggests—also leading to an increase in dopamine secretion.

Blueprint of a killer's personality

Anyone, it has been argued, is capable of committing murder, given the proper circumstances of passion and the availability of a lethal weapon. Others contend that a set of common characteristics separate murders and potential killers from the rest of society.

Now, a study of 50 murderers in San Diego has yielded what researchers say constitute "possible commonalities" among such personalities. The report, presented at the World Congress of Psychiatry, identifies several characteristics that the subjects appear to share: early traumatic experiences with parents or parent substitutes and later authority figures; low self esteem; problematic sexuality; unsatisfactory personal relationships; and frequent childhood illness.

The research was conducted by psychiatrists Carl E. Lengyel, chief of forensic services for the San Diego Courthouse and Wait R. Griswold and psychologist Abigail G. Dickson.

TV violence

The link has been suggested before, but TV's relationship to real-life violence took on more significance recently when a Miami defense lawyer cited his young client's lengthy exposure to television as a major factor in the youngster's alleged involvement in a murder case. Among the latest study results in this area, Florida psychologist Margaret Hanratty Thomas reports that violent TV shows have a definite carryover effect to real life on the third and fifth grade students she tested.

The children viewed either violent shows, or an interesting but nonviolent control film and were asked to choose the response they believed typical of other children's behavior as well as the response they thought was most morally correct in a given situation. The results indicate that "exposure to televised violence results in increased acceptance of aggression on the part of the viewers as being both normative and morally correct," she reported at the American Psychological Association meeting in San Francisco.