News of Science

Retia Mirabilia of Cetaceans

The typical vascular pattern of the mammalian body comprises a single artery accompanied by one or two veins. In the extremities of lorisine lemurs, some edentates (sloths, certain anteaters, and pangolin), and Sirenia, this simple pattern is replaced by a "blood-vascular bundle." This bundle is a specialized and complex sort of *rete mirabile* consisting of numerous small arteries and veins surrounded by a connective-tissue sheath. The function of such a bundle has long been a mystery. Among terrestrial mammals, it attains its highest development in slow-moving forms and, hence, has been interpreted as a specialization correlated with sluggishness. This explanation, however, does not explain its presence in aquatic mammals.

Similar, although not identical, multichanneled arteriovenous bundles are found in the fins and flukes of whales. These have been studied by Scholander and Schevill [*J. Applied Physiol.* **8**, 279 (Nov. 1955)]. Each major artery is surrounded by a multiple thin-walled, trabeculate venous channel, resulting in two concentric conduits, the warm one being inside. In addition, there are separate superficial veins with thicker walls. On the basis of the anatomical findings and perfusion experiments, the authors conclude that these blood-vascular bundles are concerned with heat preservation. In such a countercurrent system, the warm arterial blood is cooled by the venous blood already chilled in the fin. Thus the heat of the arterial blood does not reach the fin but is short-circuited back into the body via the venous system. Body heat is therefore conserved at the expense of keeping the appendage cold. The efficiency of heat exchange in a system of this sort is related to speed of blood flow. The slower the flow, the more efficient the heat conservation. On the other hand, cooling of the fin during exercise in relatively warm water could theoretically be accomplished by rapid flow of blood into the appendage. Temperature measurements taken on porpoises support the concept that there is heat regulation in the fins.

The authors interpret the analogous blood-vascular bundles in the limbs of sloths as serving a similar function, since these extremely sluggish animals can barely keep warm even in their warm environment. One wonders whether the same reasoning can be applied to the bundles of the slow lemurs—which apparently are more active than the sloths —and of the pangolin—which is not an exceptionally sluggish animal.—W. L. S., JR.

Peace Pills

Within the last 4 years, tranquilizing drugs have come into wide use for relief from daily tensions and from the special demands of business or professional life. Unlike sedatives, the tranquilizers are supposed to reduce anxiety without loss of alertness. The American Psychiatric Association, although recognizing the legitimate use of such drugs in the psychiatric treatment of certain classes of patients, has taken a stand against their casual use in a statement mailed to its 9353 members.

Something like 35 million prescriptions for the drugs will be written in 1956, according to the APA. The association also cites a recent estimate that among the first ten compounds most frequently prescribed in 1955, three were tranquilizers. The statement issued by the APA said that it was important to obtain scientific data about drugs and warned that the treatment of emotional illness with the tranquilizing drugs involves the obligation of close supervision by a physician familiar with this specialty.

Psychiatrists are not the only scientists investigating the effects of the new drugs on emotional behavior. In a recent effort to use laboratory methods to gain more of the needed data, Joseph V. Brady [*Science* **123**, 1033 (8 June 1956)] demonstrated that rats and monkeys under the influence of reserpine will continue to gain rewards by pressing bars during short periods of "emotional stress." Even with this advantage, however, the total number of lever responses for a longer period—one that includes shorter periods of stress—is less than the number achieved by saline control animals, whose responses are momentarily depressed during the shorter periods.

Genetics of the Leopard Frog

When one considers the widespread use of the common leopard frog, *Rana pipiens,* in elementary laboratory study in biology, it is indeed surprising that so little is known about its genetics. Now Peter Volpe [*J. Heredity* (Mar.-Apr. 1956)] has presented the results of some analyses of great interest. The nonspotted variety of leopard frog found in certain populations has been known since 1942 to be a simple Mendelian dominant to the common spotted pattern. A mottled variety found in southwestern Minnesota has been shown by Volpe to be also a simple Mendelian dominant. When the two mutant varieties were crossed in either direction, Volpe obtained 2 mottled : 1 nonspotted : 1 spotted. A complete analysis can be made only if the hybrids can be reared to sexual maturity and backcrossed to the common spotted form; but it seems likely that the three varieties depend on a series of multiple alleles, C^K (mottled) being dominant over C^B (nonspotted), and both of the foregoing alleles being dominant over c (spotted).

The difficulty is that of rearing the frogs in the laboratory from the stage of metamorphosis to that of sexual maturity. It would be interesting to see whether tagged or marked hybrids could be released into one or more ponds containing only the *pipiens* form and could then be recaptured for genetic testing after 2 or 3 years. The experiment might also throw interesting light on some important problems of population genetics; for example, what happens in a population of a given size when one or the other of the mutants is introduced at a specific frequency? Will the fate of the seeded mutant be the same at different levels of seeding and in different sizes of populations? Will the fate be the same in ponds within the natural distribution of the mutant form as in ponds outside of the natural distribution? Will a pond seeded with both the mottled and the nonspotted forms show a superior advantage of either one in competition with the normal spotted variety? Many problems of evolutionary, as well as genetical, interest may be attacked by turning the laboratory out of doors, so to speak.—B. G.

Polio Vaccine Available

The release of a total of 17,172,396 cubic centimeters of poliomyelitis vaccine during June—almost twice as much as was ever before released in a single month—was announced recently by the U.S. Public Health Service. Altogether, 79,058,460 cubic centimeters have been released to date. Commenting on the record production in June, Marion B.