News of Science

Urine of Anthropoid Apes

The comparative biochemistry and physiology of the order Primates represent almost unexplored fields. The few existing studies, however, indicate their value in assessing phylogenetic relationships. Hence any contribution in this area is of considerable interest. Gartler, Firschein, and Dobzhansky [*Am. J. Phys. Anthrop.* **14**, 41 (March 1956)] have recently studied the urinary amino acids of anthropoid apes (37 chimpanzees, six gorillas, three orang-utans, two gibbons) using techniques of paper chromatography.

Several striking differences between man and apes are apparent. Experiments indicate that diet is not an important factor in their production. Man excretes much more creatinine and histidine, whereas the apes excrete much more glutamic and aspartic acids. Urinary beta-alanine seems to be absent in orang and gibbon and is rare in man, but it is quite common in both chimpanzee and gorilla. The authors note that although fundamental differences in intermediary metabolic mechanisms are suggested, definitive evaluation requires thorough investigation of metabolism, particularly of renal clearances, in the apes.

In their high glutamic and aspartic acid concentrations and low creatinine content, anthropoid ape urines resemble those of human infants, rather than those of adult men. On the other hand, the histidine content is not particularly low in infant urine, nor is beta-alanine frequent.

Differences between the several ape genera appear less pronounced than those between apes and man. Histidine excretion rates are probably higher in chimpanzees than in other anthropoids, and gorillas seem to possess uniquely high excretion rates of aspartic and glutamic acids, glycine and alanine. But more observations are needed.

Various excretion rates differ not only between ape genera but also between individuals of a genus, coefficients of variation often being of the order of 100. Chimpanzees vary most, at least as much as men.

Since complete daily urine samples are difficult if not impossible to secure in nonhuman primates, the water content of samples varied greatly. Concentrations of most substances were therefore expressed in terms of milligrams per milligram of creatinine excreted. Creatinine was chosen as a standard because it is excreted in man at daily rates that vary less than those of other substances, being strongly correlated with total muscle mass. The authors note, however, that use of this standard presents a problem when comparing amino-acid excretion rates. For creatinine concentration is much the highest in man, being three times that of the chimpanzee and seven times that of the gorilla. Consequently, an apparent difference in amino-acid rates may merely reflect a difference in creatinine concentration. This must always be kept in mind when comparisons are made.

The meaning of this striking dissimilarity in creatinine concentration between man and anthropoids is not clear. It appears most likely to the authors that a difference in volume of urine passed per unit of body weight in a given time is a major factor. They conclude that if creatinine excretion is a measure of muscle mass, a gorilla must excrete at least as much as, and probably more than, a man. Consequently, considering the average creatinine content, a gorilla must produce about seven times as much urine per diem as a man. But, since adult gorillas may attain a body weight of some 600 pounds, this figure seems far too low; rather, on this basis, one would expect the daily urine output of an adult gorilla to be at least 15 or 20 times that of an adult man. Because this appears more than unlikely, some other factor must be involved. Perhaps the answer lies in unlike renal-clearance mechanisms.

This study is a valuable contribution to primatology. But it is obvious that the real significance of a study of this sort can hope to become apparent only after it has been broadly extended to include other primates as well.—W.L.S., JR.

Trailmarkers for Arctic

An electronic technique for marking trails in the arctic has been developed by the Army's Engineer Research and Development Laboratories, Fort Belvoir, Va. A system consisting of two parallel wires and a vehicular-mounted radio-type receiver has been successfully tested on the Greenland Ice Cap.

An alternating current is fed into the wires, which are buried beneath the snow on either side of the trail to mark the route electrically. The receiver, on a tracked vehicle commonly known as a "weasel," detects the current in the wires. Indicators in the vehicle give the driver his position within the trail. Warning devices alarm the driver when the vehicle gets out of bounds and crosses a trail wire.

Poor visibility during the polar night, snow storms, and dense arctic fog make free movement over the ice cap virtually impossible. Travelers face the possibility of getting lost and falling into hidden crevasses. Bridged over slightly with snow, crevasses are dangerous even in good visibility. An electronic trail is now being extended over 100 miles on the ice cap.

Work is continuing at the Fort Belvoir Laboratories and at General Mills, Inc., Minneapolis, Minn., to improve existing techniques and equipment. A new design is already under test on the ice cap, and a simplified one-wire trail-marking system that may reduce installation and maintenance costs is also under consideration.

Tarnishing of Silver Mirrors

The behavior of front-silvered mirrors is of considerable interest to the laboratory physicist and chemist. The material presented here was contained in an article by H. Koenig and E. Kirste that appeared in the June issue of *Die Naturwissenschaften*.

It is commonly assumed that tarnishing is caused by silver sulfide. Some time ago it was found that the reflectivity of a silver mirror can be considerably increased if its silver surface is exposed to vapors of nitric acid or hydrogen peroxide immediately after evaporation in a high vacuum. X-ray diffraction shows only the rings corresponding to silver. Therefore, silver layers of about 30-angstrom thickness were deposited on collodion; immediately after they were prepared, they were exposed to nitric acid or hydrogen peroxide vapor and investigated by electron diffraction. The resulting diagram showed definitely the formation of silver chloride. This also was proved by chemical tests.

It is therefore necessary to assume that very small traces of chlorine in the chemicals or in the air of the laboratory produce the silver chloride on the surface of the silver mirror. Actually, it is possible in 1 or 2 weeks' exposure to the air to get the strongest silver chloride rings in electron diffraction, and only after more than

3 weeks is the diffraction diagram of silver sulfide found.

The rate of reaction of the transformation of silver into silver chloride in air can be considerably increased by exposure at between 200 and 250°C. In this case, in only half an hour, very thin layers of silver are changed to silver chloride. In this way extremely sensitive detection of the chlorine content of air is possible. Silver layers are of course transformed into silver chloride if they are exposed to hydrogen chloride vapor. However, if the layers are heated in chlorine-free oxygen for several hours at 250°C, no silver chloride is formed, and the diffraction pattern shows only the characteristic silver interferences.

The increase in the reflectivity of the silver mirrors after treatment in nitric acid or hydrogen peroxide vapor is therefore caused by a covering layer of silver chloride, and the high refractive index of the covering layer of suitable thickness produces the increase in reflectivity.—K.L.-H.

New Adenovirus Vaccine

The Public Health Service and the Department of the Navy have jointly announced preliminary results of a field trial of a new virus vaccine developed against certain respiratory diseases prevalent in military recruits. The results showed that the vaccine prevented from 50 to 70 percent of the total reported respiratory illnesses characterized by fever. These illnesses are of the grippe variety and do not include the nonfeverish infections generally designated as the common cold.

Approximately 4000 recruits at the Naval Training Center, Great Lakes, Ill., were given the vaccine, which was developed at the National Institute of Allergy and Infectious Diseases in Bethesda, Md. Results of the vaccine evaluation are reported in the 18 Aug. issue of the *Journal of the American Medical Association.* The authors are Joseph A. Bell, Matthew J. Hantover, Robert J. Huebner, and Clayton G. Loosli. Bell and Huebner are PHS investigators, Hantover is in charge of research at the Great Lakes Naval Training Center, and Loosli is head of the department of preventive medicine at the University of Chicago.

The vaccine was prepared from adenoviruses Types 3, 4, and 7, formerly designated as APC viruses. A substantial proportion of the feverish respiratory illnesses that occurred in both vaccinated and unvaccinated recruits was shown to be due to Type 4 adenovirus. Illnesses caused by Types 3 and 7 were not prevalent during the period of observation.

In summarizing their results, the authors state that "all evidence indicates that the vaccine induced a substantial reduction in the occurrence of acute febrile respiratory illness associated with adenovirus Type 4." Similar results have been obtained in vaccine studies by Army investigators working with the same group of respiratory viruses.

Child Care Council

Seventeen leaders in pediatric medicine have announced the formation of the National Council on Infant and Child Care, Inc., an independent nonprofit organization formed for the purpose of providing medical counsel in the utilization of mass media. Allan M. Butler, professor of pediatrics at the Harvard Medical School, and chief of the Children's Medical Service at Massachusetts General Hospital, Boston, is president of the council.

Plans for the NCICC include the establishment of an information service for reporters who write on medical subjects for newspapers, radio, television, and popular magazines. The NCICC will inaugurate awards for outstanding contributions to public understanding of matters pertaining to the health and welfare of infants and children. The council has also adopted a "Code for Advertising" to "encourage truthful, informative promotion of products that are important to child health." The code will be available to manufacturers of medical and nutritional products to assist them in conducting their promotion along lines that would provide factual information to the public.

The NCICC has established headquarters in the New York Academy of Sciences Building in New York City. Margaret Lyman, former pediatrics research fellow of the Public Health Service at the State University of Iowa, has been appointed educational director and will devote full time to this function. The council is supported by grants from interested business concerns and other organizations.

NSF Appropriation

The appropriation for the National Science Foundation for fiscal 1957 as finally approved is $40 million, compared with $16.12 million in 1956. The funds will be allocated in the following principal ways (comparable figures for 1956 are in parentheses): support of basic research in the sciences, $16.25 million ($9.3 million); development of manpower (fellowships, science education, register of scientists, including $9.5 million for summer institutes for high-school teachers), $14.5 million ($3.6 million); scientific facilities, including $3.5 million for the radioastronomy observatory in West Virginia [*Science* **124**, 310 (17 Aug. 1956)], $5.8 million ($800,000); communication of scientific information, including translations from the Russian and making available U.S. Government publications through support of programs in the Office of Technical Services and the Library of Congress, $900,000 ($550,000); policy studies, including statistical studies of research in the United States, $750,000 ($680,000); management and executive direction of the NSF, $1.8 million (1.19 million).

Mist Control Made Easy

Two USDA plant pathologists, C. May and E. Hacskaylo, have improved a device for controlling and maintaining moisture in greenhouse propagating rooms. Despite its relative simplicity, the new device has proved reliable and long-lasting. It is made up of a small porous clay globe, a few inches of small-diameter glass tubing, and a foot or so of copper or nichrome wire.

The clay globe is known to scientists as a Livingston atmometer. The assembly of the other parts is new. During misting, water collecting inside the globe fills the glass U-tube, which also contains one of the wires leading to the switch of the mist machine. When water reaches high enough in the tube to make contact with the other wire, the circuit is completed and the mist machine stopped. When evaporation from the globe drops the water to a level low enough to break the circuit, misting begins again. The device has helped grow a high percentage of strong, well-rooted cuttings, reducing the unit cost of controllers and speeding research.

Stratosphere Laboratory

Two naval observers have just completed a high-altitude meteorological experiment while on a "skyhook" plastic balloon flight. The research involved short-range photography of vapor trails produced by jet aircraft. One phase of the Office of Naval Research "stratolab" program is to conduct research from a manned "space" laboratory attached to a plastic balloon.

This initial manned flight reached an altitude of 40,000 feet. The program's objective is to provide a laboratory in the stratosphere for observers to conduct research that cannot be carried out by other means. The recent successful flight is the culmination of 10 years of "skyhook" research by ONR. The new laboratory will be used for sustained periods at varying altitudes, and future flights are expected to go significantly higher.