News of Science

Gorilla Born in Captivity

On the morning of 22 Dec. 1956, a gorilla was born in the Columbus (Ohio) Zoo. This is a particularly noteworthy event, for the little female ape is the first gorilla known to have been born in captivity. Births of chimpanzees in captivity have become relatively common occurrences, and similar births of orang-utans are less common but not extremely rare. Hence, all of the three great apes have now been born while under confinement by man.

A full, official account of this epochal event is not yet available; but certain pertinent details have been published in the newspapers and popular magazines. Weight of the newborn gorilla is given as both 4.5 pounds (according to both Associated Press and United Press dispatches published 23 Dec. 1956) and 3.25 pounds (*Life,* 14 Jan. 1957). The gestation period is reported to have been 258 days (*Life*) or 259 days (AP and the *New York Times,* 23 Dec. 1956). The mother weighs either 260 pounds (UP and *Life*) or 280 pounds (AP), and she is said to be 9 years old (all three sources). The father weighs either 380 pounds (*Life*) or 400 pounds (AP), and his stated age is 11 years (all three sources).

According to one report (UP), the birth was "apparently premature." The basis for this diagnosis is not clear. Presumably, it rests on the birth weight of the infant. If so, however, such a conclusion may not be justified. Reichenow [*Real Soc. Espan. Hist.,* T. Extraord. (1921), pp. 337–348] captured a baby gorilla that was probably only a few days old and weighed only 2 kilograms (4.4 pounds), a weight which agrees with that first reported for the Columbus infant. A young gorilla captured by Famelart [*Bull. Soc. Zoöl. France* **8**, 149 (1883)] was estimated to be 7 months old, yet it also weighed only 2 kilograms. (It seems likely that Famelart's estimation of age was too high; however, according to Schultz [*Mem. Carnegie Mus.* **11**, 1 (1927)], this animal must have been at least 2 months old, on the basis of the teeth that had erupted.)

From these observations, plus additional data published by Brandes (1930), Schultz concluded that the newborn gorilla does not exceed 2 kilograms [*The Anatomy of the Gorilla* (New York, 1950), pt. 5, pp. 227–248]. Indeed, of all the simian primates studied, the gorilla weighs relatively the least at birth. The average weight of the newborn in percentage of the weight of fully adult females is 2.4 for the gorilla, 5.5 for man, 4.0 for the chimpanzee, 4.1 for the orang-utan, 6.0 for the siamang, 7.5 for the gibbon, 4.6–7.0 for various Old World monkeys, 7.0–8.5 for several New World monkeys, and 4.6 for the true lemur [Schultz, *Primatologia* **1**, 887 (Basel, 1956)]. This is not surprising, since among species that are closely related the larger ones usually have relatively the smallest babies (Schultz, 1956).

No competent student of primates would seriously doubt the close relationship of gorillas and chimpanzees, which, indeed, at times have been regarded as no more than different species of one and the same genus. Taking the weight of the newborn Columbus gorilla as 4.5 pounds and that of its mother as 260 pounds, one obtains a relative birth weight of 1.7; or, if the mother's weight was actually 280 pounds, 1.6. Although these values are somewhat less than the value given by Schultz (2.4), prematureness is not necessarily indicated; one has only to consider the variability of the birth weight of the normal full-term human newborn. If, however, the weights of the gorilla newborn and mother were actually 3.25 pounds and 260 pounds, respectively (as was stated in *Life*), the resultant ratio (1.25) might well indicate a somewhat premature birth.

The claimed length of the gestation period, 258 (*Life*) or 259 days (AP and *New York Times*), is of considerable interest, since it is the only estimate available for the gorilla. This at best can be accepted as the possible maximum for the Columbus birth, and it is not improbable that the actual length of gestation was somewhat less. For this gestation period has presumably been estimated from the very day on which the parents were first put together in the same cage (*Life*)! It is this sort of reckoning that has produced at least some of the impossibly high estimates of gestation duration for various primates and other mammals that can be found scattered in the literature. Regarding the reported Columbus estimate, one must await official publication to learn whether records of the mother's menstrual periods and other related, pertinent data have been recorded before deciding about its probable validity. A gestation period of 258 or 259 days for the gorilla, or even a bit less, would be consonant with the existing data for the other giant primates—man, chimpanzee, orang-utan—even if one regards the Columbus birth as slightly premature. The gestation period (from conception to birth) averages approximately 266 days for man, 231 (range 202–261) days for the chimpanzee [Yerkes, *Chimpanzees* (New Haven, 1943), based on 44 normal births at the Orange Park, Fla., primate laboratories], and 273 days for the orang-utan (Schultz, 1956). Lengths of periods, if figured from the last menstruation, would be approximately 2 weeks greater.

The gestation periods of other primates investigated are considerably shorter. The gestation period of the small anthropoid ape, the gibbon (*Hylobates*), appears to be about 210 days (Schultz, 1956). The period of the closely related siamang, *Symphalangus,* is not known). For Old World monkeys of the subfamily Cercopithecinae, reliable determinations (from conception to birth) apparently have been made only for several species of macaque—namely, for rhesus monkey, *Macaca mulatta,* 164 (146–180) days [Hartman, *Contribs. Embryol. Carnegie Inst. Wash.* **23**, 1 (1932)]; the crab-eating macaque, *M. irus,* 167 (154–180) days [Spiegel, *Arch. Gynäkol.* **177**, 590 (1950)]; the bonnet macaque, *M. radiata,* 163 (153–169) days [Hartman, *J. Mammal.* **19**, 468 (1938)]; and the pig-tailed macaque, *M. nemestrinus,* 171 days [Zuckerman, *Proc. Zool. Soc. London,* 593 (1931)]—and for the hamadryas baboon, *Papio hamadryas*—which has a gestation period averaging 172 (154–185) days [Zuckerman and Parkes, *Proc. Zool. Soc. London,* 139 (1932)]. Length of gestation in the closely related subfamily Colobinae has been said to be greater; but more detailed and more precise studies are needed.

In the marmoset, *Callithrix jacchus,* and the tamarin, *Leontocebus rosalia,* small monkeys belonging to the New World family Callithricidae, the gestation period is reported as 140 to 150 days [Lucas, Hume, and Smith, *Proc. Zool. Soc. London* **107**, 205 (1937); Asdell, *Patterns of Mammalian Reproduction,* (Ithaca, N.Y., 1946)]. According to Jennison [*Table of Gestation Periods and Number of Young* (London, 1927)], the period is 139 days in the larger New World monkeys of the family

Cebidae—*Ateles paniscus, Alouatta seniculus, Cebus apella*—and thus approximately the same length as that of marmosets and tamarins; but, in view of the unacceptable estimates that this author gives for some other mammals, these values are certainly open to question.

Published estimates of gestation length in lemurs vary widely, and most of these must be viewed with suspicion. The values for the true lemur (*Lemur*), about 126 days (Schultz, 1956, collected from various sources), and for the lesser galago (*Galago senegalensis*), about 120 days (that is, 4 months) [Lowther, *Zoologica* **25**, 433 (1940)], are probably reliable. The gestation period of *Tarsius* is quite unknown. In the tree-shrew, *Tupaia,* which may or may not be regarded as a primate, depending on one's point of view, the period is said to be only 3 weeks, as in rats and mice [Mann, *Ann. Rept. Smithsonian Inst. for 1953* (Washington, D.C., 1954)].

The reported ages of the Columbus gorilla parents, 9 years for the mother and 11 years for the father, if even approximately correct, indicate that both of these animals are young adults. According to data collected by Schultz (1956), menarche in the gorilla female occurs at 9 years, and completion of growth in length in the gorilla male occurs at 11 years. Yet it must be realized that the estimated ages of these Columbus gorillas at best are reasonable approximations; for the animals are said to have been brought to this country only 6 years ago [AP dispatch in *Baltimore Sun,* 23 Dec. 1956]. Their reported weights—380 or 400 pounds for the male and 260 or 280 pounds for the female—are of little help in age diagnosis. Captive gorillas, moreover, tend to be much heavier than wild-shot ones, owing probably at least in part to accumulation of fat as a result of inactivity.

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Archbold Expedition to New Guinea

Leonard J. Brass, associate curator of the American Museum of Natural History, has reported that the fifth Archbold Expedition to New Guinea has successfully concluded 10 months of field work in the D'Entrecasteaux Group, Woodlark Island, the Louisiade Archipelago, and the Trobriand Islands in the Territory of Papua. Brass, the leader and botanist, says that important collections of plants and mammals were obtained from all of the larger islands. Russell F. Peterson was responsible for the mammal collection, which will be of great interest in the speciation studies in progress at the American Museum of Natural History. Insects, amphibians, reptiles, fresh-water fish, and mammalian ectoparasites were also collected.

During the past 25 years Archbold Expeditions have been carrying out the systematic biological exploration of New Guinea and the adjacent islands. In 1948 an expedition also investigated the Cape York Peninsula of Queensland, Australia. Brass has participated in all six of these expeditions. His botanical collections go to the Arnold Arboretum, which in turn distributes the material to the other important herbaria throughout the world. Richard Archbold, Research Associate of the Museum, and head of the Archbold Biological Station near Lake Placid, Fla., is the sponsor of these expeditions.

Thermophysical Properties

On 1 Jan. Purdue University established a Thermophysical Properties Research Center with two long-range objectives: (i) to serve as a world center for the collection, analysis, correlation and dissemination of data on thermophysical properties; (ii) to provide unique facilities and opportunities for graduate study and research on thermophysical properties. The program is under the immediate direction of Y. S. Touloukian, professor of mechanical engineering. Administration of the program will be handled by the School of Mechanical Engineering (H. L. Solberg, head). An advisory committee has been established to serve as a consulting body and to act as coordinating group for all research on thermophysical properties conducted at Purdue.

Union Carbide Research Institute

The formation of the Union Carbide Research Institute to engage in basic scientific research has been announced by the Union Carbide and Carbon Corporation. It will be located on the corporation's Westchester property near Tarrytown, N.Y. The institute will be under the administration of Augustus Kinzel, vice president for research.

E. R. Jette, formerly head of the chemistry and metallurgy division at Los Alamos Scientific Laboratory, Los Alamos, N.M., has been appointed director of the institute. His assistants are S. R. Aspinall, formerly with the U.S. Office of Naval Research, and A. J. Stosick, formerly division chief of the rockets and material division of the Jet Propulsion Laboratories at California Institute of Technology.

A major purpose of the new unit will be to study the physical and chemical behavior of matter under ordinary as well as extreme conditions of pressure and temperature. This work will complement and extend the basic research now being carried on in the existing research laboratories of the Union Carbide and Carbon Corporation. The facilities for the institute are expected to be completed by the spring of 1958.

Wildlife Refuges

The U.S. Fish and Wildlife Service records show that from 1 Jan. 1953 until 30 June 1956, a total of 162,398 acres has been acquired for wildlife purposes by purchase, lease, donation, or public land order. This figure includes the new Snake Creek National Wildlife Refuge, a 24,623-acre wildlife area on Garrison Reservoir in North Dakota. The Snake Creek Refuge is the largest single addition; Chassahowitzka National Wildlife Refuge in Florida is second with 16,978 acres and Kirwin National Wildlife Refuge in Kansas is third with 10,864 acres.

Du Pont Education Program

The Du Pont Company will give more than $1 million in grants to 122 universities and colleges in its program of aid to education for the next academic year. More than half of the entire program is for the improvement of teaching in universities, colleges, and high schools. This phase of Du Pont's program is in three parts.

1) Grants of $4000 each have been awarded to 70 colleges that have records of strength in undergraduate chemical or technical education. Of each grant, $2500 is to strengthen the teaching of chemistry and $1500 is to aid the teaching of other subjects that contribute to the education of scientists and engineers. Grants of $4000 each go to 23 major universities in order to strengthen the undergraduate teaching of those courses that contribute to scientific and engineering education.

2) An allocation of $149,000 is for 39 postgraduate teaching assistantships mostly in chemistry, to be shared by 35 universities. The assistantships will go to graduate students who have demonstrated their ability to teach undergraduates in their universities and who will continue teaching during the time they have the grants.

3) A total of $61,000 in fellowships and scholarships will be used to encourage able young people to become high-school teachers of science and mathematics. This includes 26 fellowships for postgraduate students at seven universities and 20 summer scholarships for undergraduates at two colleges. The company also awarded 98 teachers' fellowships to five institutions for the com-