

tured in 1959 from edible gourd, variety Cucuzzi, (*Lagenaria leucantha* var. *longissima*) in North Carolina, has formed the perfect stage when the cultural techniques for mating fungi described by Nelson (1) were used. Perithecia contained very few mature ascospores when selfed, although when they were paired in combination with certain other isolates of *Colletotrichum orbiculare*, ascospores were produced in abundance. Progeny ascospore isolates also produced fertile perithecia. Pathogenicity studies with the original isolate and with ascospore progeny cultures indicated that the gourd isolate is of the type described by Goode (2) as *C. orbiculare* race 1.

The sexual stage of *C. orbiculare* has been reported previously only twice. Stevens (3) induced cultures of *C. orbiculare* to produce perithecia by the use of ultraviolet radiation. These perithecia contained asci but did not form mature ascospores. He described this perfect stage as *Glomerella lagenarium*. Because Steven's isolate did not form mature ascospores, the proposed name *G. lagenarium* for the cucurbit anthracnose fungus has not been generally accepted. Watanabe and Tamura (4) observed perithecia in cultures of an anthracnose fungus isolated from infected cucumber (*Cucumis sativus*) leaves. They named their isolate *Glomerella lagenaria*. In a monographic study of the genus *Colletotrichum*, von Arx (5) considered *C. orbiculare* as a specialized conidial form of *Glomerella cingulata*. Von Arx also showed that the specific name *Colletotrichum lagenarium* (the binomial used almost exclusively in the literature) was improper. After reviewing the papers of Berkeley (6), we agree with von Arx that the taxon *C. orbiculare* has priority for the asexual form of this fungus.

The perfect stage of the North Carolina isolate has been identified as a species of *Glomerella*. Preliminary comparisons of the North Carolina isolate with the isolate of Watanabe and Tamura and with several isolates of *Glomerella cingulata* have been made. The North Carolina isolate of *Glomerella* differs from *G. lagenaria*, as described by Watanabe and Tamura, in growth rate, colony morphology, presence of setae, conidial color, and pathogenicity. The only similarities are in conidial shape and size. Morphologically the sexual stages of both organisms fall into the broad description given for *G. cingulata*. However, the exact taxonomic relationships of these isolates have not been established. Studies are in progress to clarify the taxonomic position of the North Carolina isolate of *Glomerella* and to determine

its genetic relationship to the previously described races of *Colletotrichum orbiculare* (*C. lagenarium*) (7).

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Evoked Cortical Potentials in Absence of Middle Ear Muscles

Abstract. Evoked potentials to click at auditory cortex were recorded from cats deprived of middle ear muscles. Variations in the amplitude of the response after surgery indicate that the participation of these muscles in habituation, conditioning, and distraction must be minimal.

Lability of evoked potentials to auditory stimulation has been demonstrated at various auditory and nonauditory loci in habituation, conditioning, distraction, and extinction (1). It has also been demonstrated that middle ear

muscle action not only contributes to sound attenuation at the periphery of the auditory mechanism—for example, at cochlear round window (2)—but that these muscles may and do participate in central phenomena such as conditioning (3).

Hernández-Péon *et al.* (4) showed that electrical responses to clicks in the dorsal cochlear nucleus of the cat are depressed during attentive behavior. They attributed this attenuation to a reticular influence which controls sensory transmission at the first synapse, presumably by way of efferent paths.

Hugelin *et al.* (5) took exception to this neural mediating mechanism and suggested that the lability observed at the cochlear nucleus may be adequately explained by contractions of middle ear muscles. They showed in the curarized "encéphale isolé" cat (muscles inactivated) that reticular stimulation has no effect on the amplitude of the dorsal cochlear nucleus response to click. Furthermore, in normal cats deprived of middle ear muscles on one side, reticular stimulation attenuated cochlear nucleus potentials on the normal but not on the operated side. From this they suggest that the middle ear muscles are responsible for the amplitude reduction at cochlear nucleus in the normal cat.

The present study was undertaken to determine whether evoked potential lability at the auditory cortex of normal cats could be entirely accounted for by middle ear muscle contraction. Four

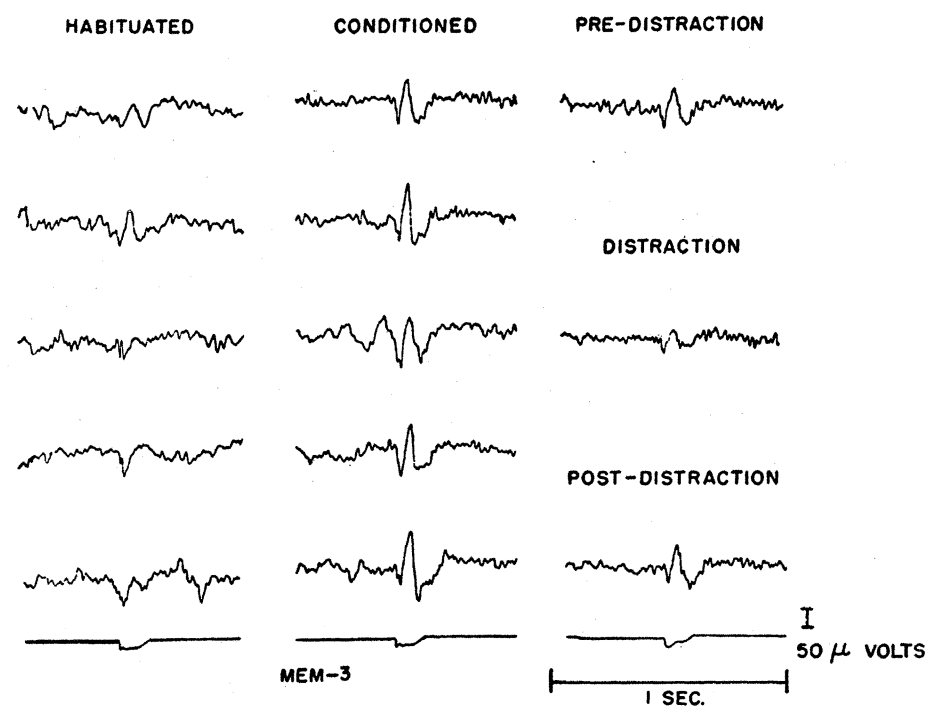


Fig. 1. Electrical responses to click at auditory cortex during habituation, conditioning, and distraction.

cats were prepared under anesthesia as follows. The stapedius and tensor tympani muscles were cauterized bilaterally. Then recording electrodes were implanted on both cochlear round windows as well as upon the auditory cortex (A_1) of one side. A day or so after the operation, the cats were placed in a cage located in an electrically shielded sound-attenuated experimental room and "habituated" by exposure to clicks of moderate intensity delivered at a rate of one click per 10 seconds day and night for at least 10 days. Complete electroencephalographic recordings, as outlined below, were made on three animals with a Grass model IIIId electroencephalograph located adjacent to the experimental room.

Figure 1 illustrates five successive click-evoked cortical potentials taken from one typical cat in the "habituated" state. Soon after this habituated sample was collected, the animal was conditioned by reinforcing selected clicks with a puff of air directed to its face. Figure 1 clearly shows enhancement of the evoked potentials produced by this reinforcement. The number necessary to produce such marked changes in evoked potentials varied with the animal, but in all three cases, fewer than five puffs produced the "conditioned" changes apparent in the figure.

In three cats amplitude measurements were made on 25 successive responses taken during both the habituated and the conditioned periods, and their means were compared by *t* tests. For each of them, the increase in size of the conditioned evoked potential was significant beyond the .0001 level.

Soon after the conditioned tracings were obtained, the experimenter visually distracted the cat during the delivery of one click by standing at the open door of the laboratory. The last column of Fig. 1 shows the tracings obtained immediately before, during, and after distraction.

Successful removal of the middle ear muscle attachments to the ossicles was verified in two ways. First, the round window response to tone bleeps ranging in frequency from 500 to 5000 cy/sec delivered through earphones is in normal animals reduced in amplitude by middle ear muscle contraction within 15 to 20 msec of its onset; this reduction did not occur in the animals in this series. Second, at autopsy the muscles on both sides were found to have been severed in each cat.

Thus, our data show that in cats without middle ear muscles the variations seen in evoked potentials at the auditory cortex during habituation, conditioning, and distraction closely resemble what is seen in an unoperated

animal subjected to the same procedures. Any participation of the muscles in producing these response amplitude variations must therefore be minimal (6).

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Gamma Globulin (Gm group) Heterogeneity in Chimpanzees

Abstract. The serum gamma globulin (Gm) serological system was examined in 24 chimpanzees. Five Gm a, Gm b, and Gm x phenotypes, including Gm (a-b-x-), were observed. Phenotype did not appear to be related to serum gamma globulin concentration. The presence of the Gm system in apes suggests that this polymorphism in man is balanced and ancient.

The various genetic polymorphisms found in human blood are of uncertain antiquity. An estimate of the age of any one polymorphism may be obtained by examining the blood of other animals. Application of this principle to the serum gamma globulin (Gm) polymorphism (1) is the object of the present investigation.

Serum gamma globulin typing is based upon neutralization by normal serum of an indirect Coombs type reaction occurring between selected sera from patients with rheumatoid arthritis (RA) and type O Rh+ erythrocytes sensitized with certain incomplete anti-Rh sera. Allelic specificity is usually conferred by selecting an anti-Rh serum which possesses the allelic product being typed (2, 3) and an RA serum which lacks this product (4). Gm^a, Gm^b, and Gm^x are apparently allelic in man. Gm^a and Gm^b are co-dominant with the result that three phenotypes and corresponding genotypes are distinguish-

Table 1. Ranges of Gm classification scores in chimpanzees.

Allele	RA dilutions employed	Control scores (saline)	Phenotype		
			Gm+	*Gm ⁱ	Gm-
Gm ^a	1/2-1/1024	33-36	0	-	31-36
Gm ^b	1/4-1/64	16-20	0-4	8	12-17
Gm ^x	1/8-1/128	17-18	0	-	12-20

* Intermediate.

able. The phenotype Gm (a-b-) has not been observed except in individuals with agammaglobulinemia. The Gm (a-b-) phenotype has not been observed by us during typing of more than 2000 healthy people.

Sera from 24 chimpanzees (5), 2 gibbons, 25 cynomolgous monkeys, 2 rhesus monkeys, 2 spider monkeys, 1 red monkey, 4 domestic cows, and 5 mongrel dogs were examined. Sera were absorbed overnight in the cold with nonsensitized O Rh+ cells. Without absorption all but chimpanzee sera produced moderately to strongly positive nonspecific reactions. After absorption all sera were diluted 1/8 and tested. The method of examination was that described by Harboe (2). RA serum dilutions employed for typing Gm^a, Gm^b and Gm^x are given in Table 1.

The chimpanzee was the only species whose sera inhibited any of the Gm typing reactions. Agglutination scores (6) were obtained, and these, together with the resulting phenotype distinctions, are shown in Table 1. Scores were repeatedly confirmed for each animal. The observed numbers of animals with various Gm^a and Gm^b phenotypes are given in Table 2. Only one animal of 22 tested was Gm (x+), being also Gm (a+b+). The single instance of an intermediate score occurred in the Gm^b system, and this animal was arbitrarily classified as Gm (b-).

Fourteen of the chimpanzees were affected with extensive pulmonary tuberculosis. The frequencies of Gm phenotypes in this group differed slightly from those observed in healthy animals (Table 2). These differences were not a manifestation of altered amounts of gamma globulin (7), since the concentration of serum gamma globulin, estimated by the product of gamma proportion found on paper

Table 2. Gm classification of 24 chimpanzees.

Presumed genotype	Phenotype	Total	Tuber- culous	Nor- mal
Gm ^a /Gm ^a	Gm (a+b-)	1*	0	1*
Gm ^a /Gm ^b	Gm (a+b+)	11	8	3
Gm ^b /Gm ^b	Gm (a-b+)	10	5	5
- / -	Gm (a-b-)	2	1	1

* Intermediate Gm^b score.