nomial formula, separately, for every testee. In case of it being smaller than 0.05 the identification was considered to be 'good', i.e. the guessing was judged to have no practical effect.

Results. The distribution of the subjects into < 0.05 ('good') and $\geqq 0.05$ chance probability classes is illustrated in Table I. About $^1/_3$ of the testees attained at least the score 9 which was the lowest 'good' answer.

Table I. Distribution of subjects according to the identification ability level

		No. of correct responses	No. of subjects	Relative frequency
Chance	0.05 ('good')	9, 10	11	0.31
Probability	0.05	0–8	24	0.69
	Total		35	1.00

Table II. Correct and incorrect identifications with response 'own baby', according to the age of the baby

	Age of baby, days							
	1	2	3	4	5	6	7	Total
No. of mothers	5	5	5	5	5	5	5	35
M_c	0.60	0.50	0.40	0.60	0.50	0.60	0.80	0.57
M_i	0.18	0.23	0.25	1.18	0.35	0.15	0.15	0.21

M_c, No. of correct identifications of the type *own-own*, per mother, divided by maximum possible amount (2.0) of the same type of responses. M_i, No. of incorrect identifications of the type *other-own*, per mother, divided by maximum amount (8.0) of the same type of responses.

Table II illustrates response patterns classified by the age of the baby. Only 'own baby' responses are included. The identification numbers of *own-own* responses per mother were divided by the maximum attainable; numbers of *other-own* responses were treated in the same way. These statistics are denoted by M_c and M_i in the Table and considered as average numbers of the 2 types of responses in relation to the maximum possible number of the same response types. The number of mothers in each age group is small and no clear increase or decrease is to be seen in either series.

Discussion. This study shows that it is possible for some mothers to identify the hunger cry signals of their own new-born baby. A few were able to do this when the baby was only 1 day old, supporting the fact that individual differences exist, in any case, in the cries of some of the babies at this age. This may also indicate the possibility of innate identification.

This study does not take into consideration the psychological factors involved in early identification and we do not know as yet what influence mental and physical stress, cultural, social and educational differences may have on this identification[8].

Zusammenfassung. Es wurden die Fähigkeiten der Mütter geprüft, das Hungerschreisignal ihrer eigenen Neugeborenen während des Wochenbettes zu identifizieren. Man hat festgestellt, dass es für etwa $^1/_3$ der getesteten Mütter möglich ist, vorher auf Band aufgenommene Stimmen der eigenen Kinder schon in diesem frühen Alter wiederzuerkennen.

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The Somatic Chromosomes of 3 Lizard Species: *Gekko gecko*, *Iguana iguana*, and *Crotaphytus collaris*

Recent technical advances, particularly the leucocyte culture method, have greatly facilitated progress in mammalian cytogenetics. The description of correct karyotypes among lower animals is also expanding as techniques for mammalian cell culture are adapted to these organisms. We wish to describe the diploid chromosome number and the somatic karyotypes of 3 lizard species: *Gekko gecko* (Gekkonidae, Reptilia), *Iguana iguana* (Iguanidae, Reptilia), and *Crotaphytus collaris* (Iguanidae, Reptilia).

In *G. gecko* and *I. iguana*, chromosomal preparations were obtained from phytohemagglutinin stimulated peripheral blood cultures. All chromosomal preparations were made following the method of Moorhead et al.[1] with minor modifications.

Measurements were made on karyotypes derived from well-spread metaphase plates to establish the idiogram of each species. The length of each chromosome (Table) is given as the percentage of the total haploid complement in *G. gecko* and the percentage of the haploid macrochromosomal complement in the Iguanids. It is obvious that the macrochromosomes of *I. iguana* and *C. collaris* are quite similar in the length of the various elements and in their associated arm ratios. Arm ratios were not calcu-

[1] P. S. Moorhead, P. C. Nowell, W. J. Mellman, D. M. Battipps and D. A. Hungerford, Expl. Cell Res. *20*, 613 (1960).

Relative lengths and arm ratios (mean and standard error) of the chromosomes of 3 lizard species based on percentage of the haploid complement

Chromosome No.	Relative length (%)	Arm ratio	Macrochromosome No.	Relative length (%)	Arm ratio
Gekko gecko (based on 10 karyotypes)			*Iguana iguana* (based on 10 karyotypes)		
1	13.74 ± 0.204	1.65 ± 0.067	1	23.59 ± 0.232	1.20 ± 0.042
2	12.22 ± 0.183	1.82 ± 0.071	2	22.00 ± 0.376	1.54 ± 0.053
3	9.24 ± 0.160	2.01 ± 0.092	3	17.23 ± 0.286	1.14 ± 0.024
4	7.98 ± 0.201		4	15.46 ± 0.274	1.18 ± 0.020
5	7.28 ± 0.132		5	12.82 ± 0.155	1.16 ± 0.017
6	6.60 ± 0.130		6	8.90 ± 0.136	1.17 ± 0.020
7	5.70 ± 0.138				
8	5.30 ± 0.045		*Crotaphytus collaris* (based on 8 karyotypes)		
9	4.94 ± 0.092				
10	4.42 ± 0.132		1	23.85 ± 0.335	1.24 ± 0.020
11	3.88 ± 0.147		2	22.68 ± 0.339	1.82 ± 0.078
12	3.24 ± 0.102		3	18.19 ± 0.447	1.16 ± 0.026
13	2.94 ± 0.081		4	15.53 ± 0.254	1.25 ± 0.079
14	2.68 ± 0.087		5	11.56 ± 0.224	1.17 ± 0.022
15	2.42 ± 0.160		6	8.19 ± 0.231	1.25 ± 0.033
16	1.90 ± 0.055				
17	2.60 ± 0.030	4.24 ± 0.088			
18	1.72 ± 0.093	1.16 ± 0.074			
19	1.20 ± 0.084	1.06 ± 0.039			

lated for the telocentric elements of *G. gecko* nor were the microchromosomes of the other 2 species measured.

Gekko gecko. Leucocyte chromosomes of 1 male and 1 female as well as metaphase figures from the primary heart and lung cultures of a second male were examined. The distribution of chromosome counts (250 cells) yielded a diploid number of $2N = 38$ in all tissues and animals with no apparent heteromorphic pair in either sex indicative of sex chromosomes. The karyotype (Figure 1), consists of 3 pairs of large submetacentric elements; 26 telocentric chromosomes in a graduated series which can be further divided into groups of 6, 6 and 14; 1 pair of subtelocentric chromosomes and 4 metacentric elements. No microchromosomes were observed in this species.

Iguana iguana. Leucocyte metaphases from 1 male and 1 female were examined as well as early passage cells from heart, kidney, spleen and liver of 2 additional males. The diploid number proved to be $2N = 34$ with the presence of both micro- and macrochromosomes. The karyotype (Figure 2) consists of 12 macrochromosomes and an average of 22 microchromosomes (mode in 352 counted cells). The macrochromosomes, except for the second largest pair, are almost perfectly metacentric. The second largest pair is submetacentric. Most of the microchromosomes appear to be metacentric; however, in many cases these elements are too small for accurate morphological description. No evidence for heteromorphism of a sex chromosome pair in either sex was obvious.

Crotaphytus collaris. Cultured cells derived from primary lung and heart cultures of a single male were examined. A total of 42 metaphase plates yielded a diploid number of $2N = 36$ with 12 macrochromosomes and 24 microchromosomes (20 cells). The karyotype (Figure 3)

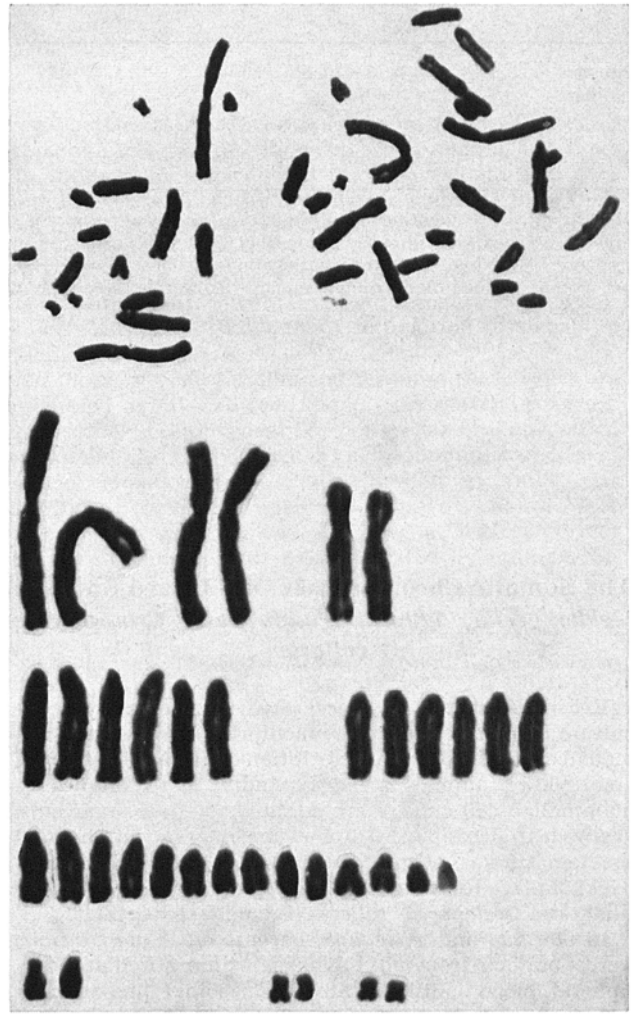

Fig. 1. The karyotype of *Gekko gecko* ($2N = 38$). Note the absence of microchromosomes.

is quite similar to that of *I. iguana*. The second largest pair of macrochromosomes is submetacentric while the remaining 10 are metacentric. However, an additional pair of microchromosomes is present in this species. PAINTER[2], using spermatogonial cells, reported $2N = 36$ or 38 for *C. collaris* with 12 macrochromosomes and 24 or 26 microchromosomes.

The chromosome numbers of the Gekkonids range from 32–46 among the species studied[3,4]. NAKAMURA reported $2N = 38$ in *Gekko japonicus* in 1932, but offered no karyotype[5]. This is the identical number observed in *G. gecko*. In agreement with MATTHEY[3], the absence of microchromosomes in *G. gecko* is characteristic for the entire Gekkonid group (as well as the Scincidae), while almost all other lizards possess both micro- and macrochromosomes. Karyotypic data from studies of some lizards have already aided in elucidating difficulties in species classification based on gross morphological criteria solely[6,7]. Although the number and morphology of the macrochromosome in *I. iguana* and *C. collaris* are similar, the modal number of microchromosomes differs in these 2 species. Therefore, the number of microchromosomes may serve as an additional parameter by which to classify these animals.

Sex chromosome heteromorphism in reptiles is still an ambiguous problem[8]. Although snakes apparently manifest female heterogamety[9–11], lizards do not[12,13]. Such seems to be the case with the species reported herein. Sex chromatin masses were not observed in the interphase nuclei of cultured cells from either *I. iguana* or *G. gecko*. The lack of obvious sex chromosome dimorphism may be due to the fact that: (1) sex chromosome differentiation in some species of reptiles is yet too primitive to be observed morphologically; or, (2) sex in these species may be determined at the genic rather than the chromosomal level[14].

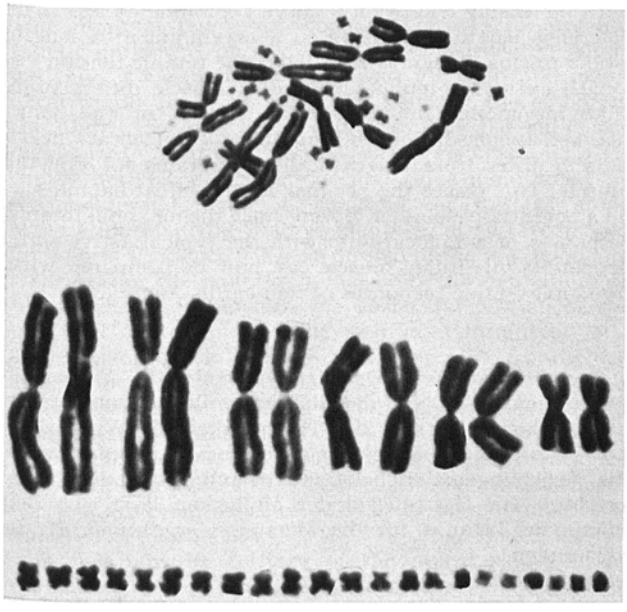

Fig. 2. The karyotype of *Iguana iguana* ($2N = 34$).

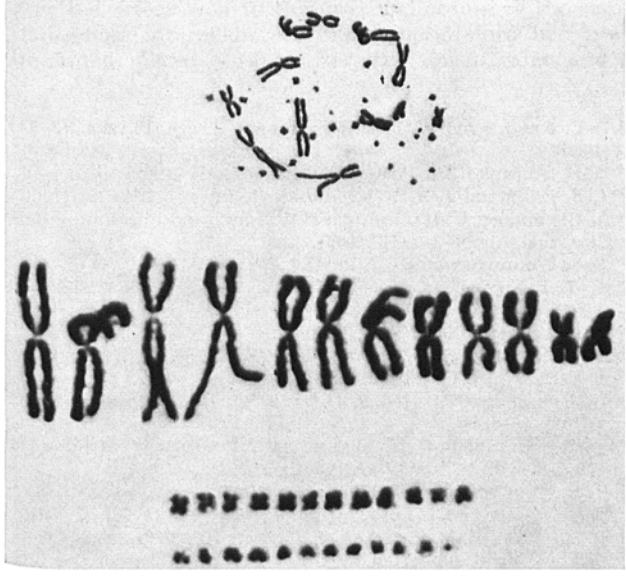

Fig. 3. The karyotype of *Crotaphytus collaris* ($2N = 36$).

Zusammenfassung. Die somatischen Chromosomen der 3 Eidechsenarten *Gekko gecko* ($2N = 38$), *Iguana iguana* ($2N = 34$) und *Crotophytus collaris* ($2N = 36$) werden dargestellt. *G. gecko* besitzt metazentrische, subteleozentrische und teleozentrische Elemente, aber keine Mikrochromosomen. *I. iguana* und *C. collaris* besitzen Makrochromosomen (6 Paare) und Mikrochromosomen. Bei den Arten *G. gecko* und *I. iguana* waren in keinen von beiden Geschlechtern heteromorphische Chromosomenpaare nach zuweisen.

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[2] T. S. PAINTER, J. exp. Zool. *34*, 281 (1921).
[3] R. MATTHEY, *Les Chromosomes des Vertèbres* (Librairie de l'Université, F. Rough, Lausanne 1949).
[4] P. C. ALTMAN and D. S. DITTMER, *Growth: Including reprodection and morphological development* (Fedn Proc. Fedn Am. Socs exp. Biol. 1962).
[5] K. NAKAMURA, Cytologia *3*, 156 (1932).
[6] G. C. GORMAN, Nature *208*, 95 (1965).
[7] L. A. PENNOCK, Science *149*, 539 (1965).
[8] R. MATTHEY, Adv. Genet. *4*, 159 (1951).
[9] W. BECAK, M. L. BECAK and H. R. S. NAZERETH, Cytogenetics *1*, 305 (1962).
[10] H. R. KOBEL, Experientia *18*, 173 (1962).
[11] W. BECAK, M. L. BECAK, H. R. S. NAZERETH and S. OHNO, Chromosoma *15*, 606 (1964).
[12] R. MATTHEY and J. M. VAN BRINK, Experientia *12*, 53 (1956).
[13] J. M. VAN BRINK, Chromosoma *10*, 1 (1959).
[14] Supported by Project No. 417 from the U.S. Children's Bureau and Grant No. 08737 from the National Cancer Institute.