treatments have been studied and compared. Groups of pen-raised and wild birds showed no consistent nor significant differences in either adrenal weight or histometry. Spleen weights were highly variable. No histologic evidence of thyroid activation was seen in birds subjected to cold. Experimental treatments, potentially capable of causing marked adrenal responses in common laboratory mammals, were relatively ineffectual in eliciting adrenal response in the quail. It is suggested that the adrenal, and possibly the thyroid, may be comparatively non-reactive in quail as compared with laboratory mammals.

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Mating Types of *Paramecium bursaria* from Japan.* (24510)

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Paramecium bursaria is known to include 6 varieties(1,2,3). These varieties may differ greatly in geographical distribution; some are widely distributed, others are relatively restricted. Variety III, for example, is highly restricted; during many years of collecting in this country, this variety has been found in only 3 localities, 2 in North Carolina, one in Massachusetts(1). Varieties VI and I, on the other hand, are widely distributed. Variety VI has been found in England, Ireland and Czechoslovakia; and Variety I in many parts of United States, China(4), and as reported here, apparently in Japan also. Members of any one of these 6 varieties do not, as a rule, mate with members of any of the other varieties. Within each variety, animals of diverse mating types conjugate readily; animals of the same mating type do not conjugate. Variety I, found in the United States and China, and apparently Japan, contains 4 mating types designated A, B, C, and D. Variety II, found in United States, contains 8 mating types, designated E, F, G, H, J, K, L, and M. Variety III, also found in United States, contains 4 mating types designated N, O, P, and Q. Varieties IV and V were found in Russia. Variety IV is known to have 2 mating types, designated R and S. Only one mating type (mating type T) has so far been found in Variety V. Further collections from Russia would probably yield other mating types in this variety. Variety VI, in Czechoslovakia, England and Ireland, is known to contain 4 mating types designated U, V, W, and X. Thus, there are now known in this species of Paramecium 6 varieties containing 23 mating types. Reported here are results of investigation on *P. bursaria* collected in Japan. The material included the following collections: Two, one from Kyoto, the other from Tokyo, sent by Dr. Shozo Inoki of Osaka Univ., Osaka, in Feb. 1953; these 2 collections yielded 16 clones. A collection sent by Dr. Toshiko Watanabe of Ashiya

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TABLE I. Collections of *Paramecium bursaria* in Japan.

Date received	Collector	Locality	No. of clones isolated	Mating types found
Feb., 1953	Shozo Inoki	Kyoto	8	B
"	"	Tokyo	8	D
Jan., 1954	Toshiko Watanabe	Ashiya City	11	D
Apr., 1958	S. Hayashi	Sapporo	18	B, C
"	K. Tanaka	Nagoya	17	A, C, one clone immature?
May, 1958	C. Tanaka	Miyagawamura, Takigun, Mieken	3	A, C, one clone adolescent

City, in Jan. 1954, yielding 11 clones. A collection sent by Dr. S. Hayashi of Hokkaido Univ., Sapporo, Apr. 1958, yielding 18 clones. A collection by Dr. K. Tanaka of Nogoya in the same month, yielding 17 clones. A collection by Dr. C. Tanaka of Miyagawamura, May 1958, yielding 3 clones. These 65 clones obtained from Japan are listed in Table I.†

Methods. The animals were cultured essentially as described by Jennings(1,5) and by Sonneborn(6), in a lettuce infusion inoculated with *Aerobacter cloacae*. When the clones were kept for extended periods they were stored in culture tubes 200 mm × 25 mm with screw caps, placed in racks near windows with northern exposure, as described by Chen (4). The Japanese clones conjugated readily with American and Chinese clones of Variety I, but not with varieties II and VI. They were therefore considered to belong to Variety I. The mating types of the Japanese clones were determined by mixing them with known 4 mating types A, B, C, and D of Variety I, of Chinese origin. Thus, if a Japanese clone did not mate with known mating type A animals, but did mate with B, C, and D animals, it was considered a mating type A clone. Similarly, a Japanese clone not mating with B animals but mating with A, C, and D animals was considered a B clone. In mixtures of a Japanese clone and a Chinese clone of appropriate mating type of Variety I, agglutinative mating reaction and pair formation occurred in normal manner. Many pairs were formed in such a mixture. Occasionally 3 or 4 animals were observed conjugating in the manner reported by Chen(7).

Results. All 8 clones from Kyoto belonged to mating type B. All 8 clones from Tokyo belonged to mating type D. All 11 clones from Ashiya City belonged to mating type D. Some of the 18 clones from Sapporo belonged to mating type B, others to mating type C. Of the 17 clones from Nagoya, 16 belonged to mating types A and C; one clone was apparently immature since it did not mate with any other clone, and upon its arrival from Japan was isolated from a vial found to contain many conjugating pairs. Of the 3 clones from Miyagawamura, one belonged to mating type A, one to mating type C, and one was adolescent, forming only a few pairs with mating types B and C, and none with A and D(5).

Summary. Studies on 65 clones of *Paramecium bursaria* collected in Japan showed that these animals apparently belonged to Variety I. All four mating types in this variety: A, B, C, and D were found.

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