posure to an estrous female are related to the level of sexual activity the males show when given the opportunity to copulate (9).

The lack of correlation between LH and androgen concentrations in foraging males is not surprising. Most studies examining the relation between LH and testosterone have found either no correlation or a sluggish testicular response to LH, with peaks in testosterone secretion lagging behind those of LH by anything from 30 minutes to 3 hours (16,18,19). The significant positive correlations between LH and both testosterone and DHT in the aggressive males are therefore all the more interesting and may represent a behaviorally activated neuroendocrine mechanism.

Plasma corticoid concentrations were not increased in the aggressive birds, even in those birds which had interacted with the intruder for 30 to 40 minutes before capture. Laboratory studies with mammals have consistently shown increased corticoid levels in both the dominant and subordinant individuals that have just had an aggressive encounter. Of course, this could be a species difference in the way animals respond to aggressive stimulation; there are no comparable data on redwings in the laboratory, nor on any other bird. Another possibility is that the corticoid levels found in our study reflect a difference between freedom to initiate and pace an aggressive interaction rather than confinement in a small open area with a conspecific.

Our data demonstrate that under natural conditions, an animal's hormone levels may fluctuate rapidly in response to ongoing social interactions. Since the birds were sampled only once, it is unlikely that our data represent maximal deviations from normal concentrations of circulating hormones. There is no question that the changes occur rapidly, however, since the average length of the aggressive interaction was 19 minutes. The rapidity with which both pituitary and steroid hormones may respond to social stimulation suggests that the endocrine system may play a more important role in modulating an animal's minute to minute behavioral responses during social interactions than was previously thought.

CHERYL F. HARDING*
Rockefeller University, Field Research Center, Millbrook, New York 12545
BRIAN K. FOLLETT
Department of Zoology, University of North Wales, Bangor, Gwynedd, United Kingdom

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10. Trap adapted from D. G. Smith, *Behaviour* **56**, 136 (1976). To present consistent levels of song, we attached a speaker to one side of the trap and connected it to a tape recorder controlled by the experimenter.
11. Using antibody S-250 (supplied by G. Niswender), we assayed plasma DHT and testosterone as described (9) but with the following modifications. Sample chromotography was carried out on columns of Sephadex LH-20 (Pharmacia) with heptane, methanol, and ethyl acetate (900 : 75 : 50 by volume) being used as the solvent. Chromatography solvent was added to each standard in the DHT and testosterone curves to correct for the slight loss of binding in the samples caused by the solvent. The DHT standard curve was run against ^{3}H-labeled testosterone rather than ^{3}H-labeled DHT. Plasma corticoid concentrations were measured against corticosterone according to the method of L. C. Krey, K. H. Lu, W. R. Butler, J. Hotchkiss, F. Piva, E. Knobil, *Endocrinology* **96**, 1088 (1975). After completion of the steroid assays, the samples were shipped frozen to Bangor where plasma LH levels were determined in triplicate at three dilutions by a micromodification of the method outlined by B. K. Follett, C. G. Scanes, and F. J. Cunningham [*J. Endocrinol.* **52**, 359 (1972)].
12. In fact, no significant seasonal trends were found in plasma hormone concentrations during the period studied. The second analysis of the data represents the most conservative view possible of the data. The six birds were not dropped at random, but in the case of the androgen analysis they were the three aggressive males with the lowest and the three males with the highest androgen concentrations, caught during the second half of April. Since the Moses test was being used to examine the possibility that data from the aggressive males tended to fall at the extremes of the distribution, dropping the data from the males that had the most extreme scores actually tended to bias the data against significance—providing a most conservative analysis.
13. The data were analyzed by nonparametric methods as described by S. Siegel [*Nonparametric Statistics* (McGraw-Hill, New York, 1956)]. The Mann-Whitney *U* test (LH data) and the Moses test of extreme reactions (androgen data) were used to compare groups. The Spearman rank correlation coefficient was used to evaluate the relation between concentrations of two hormones in the same individual. Means (± standard error) are also presented.
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20. We thank C. Quimby for assistance in the field, L. Krey and B. McEwen for the use of their laboratory facilities, and P. Marler and H. Feder for advice. Research supported by PHS postdoctoral fellowship GM 01063 01-3 and a grant from the Agricultural Research Council.
* Present address: Department of Psychology, Hunter College, New York 10021.

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The Gynoecium Winteraceous Plants

While the report by J-F. Leroy (1) provides a tantalizing glimpse of floral structure in an enigmatic plant, the provocative title and conclusions are insufficiently supported by the evidence given.

To summarize, Leroy stated that the gynoecium in *Bubbia perrieri* has two carpels fused together at their margins. However, the two placental ridges described are the usual condition for an individual carpel in other winteraceous plants such as *Drimys winteri* (2), *D. lanceolata* (3), *Pseudowintera axillaris* (4) and several species of *Bubbia* (5). Bailey and Nast (5) illustrated several species of *Bubbia* with short stigmatic regions not greatly different from that illustrated for *B. perrieri*, except that in the latter species the stigmatic crests are laterally pendant over the top of the gynoecial structure. *Bubbia perrieri* was originally described as unicarpellate (6), and soli-

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tary carpels per flower occur in other Winteraceae (*3, 7*) including several species of *Bubbia* (*5*).

Leroy illustrated what is labeled as a dorsal view of the gynoecium [figure 1B of (*1*)]. In the absence of developmental studies it would seem impossible to determine the morphologically dorsal side of such a structure in the center of the flower. If the gynoecium is in fact unicarpellate, then by analogy with other Winteraceae, the figure would not illustrate a dorsal view but rather one in which the dorsal and ventral surfaces are at the left and right sides of the illustration (*7*). Additional evidence is clearly needed before the gynoecium of *B. perrieri* can convincingly be termed compound. Thus, in the absence of illustrations showing cellular details in transversely sectioned material it would seem premature to consider two vertical grooves on diametrically opposed sides of the gynoecium as representing sutures. Evidence on gynoecial vascularization also is essential; cleared gynoecia with stained vascular bundles should unequivocally show the number of carpels, particularly as the results could be compared with similar preparations of other Winteraceae illustrated by Bailey and Nast (*5*). In view, then, of insufficient evidence at present for a compound ovary in *B. perrieri*, we suggest that this taxon should not currently be proposed as the basis for a new subfamily in the Winteraceae. Nor do we consider that the apparent differences Leroy cited in inflorescence structure between *B. perrieri* and other Winteraceae support such a concept. For example, although Leroy (*1*) noted that a special characteristic of *B. perrieri* was that, in the reproductive shoot, the bract function is filled by specialized scales rather than by ordinary leaves, bract scales have been recorded in other Winteraceae (*2, 4, 8*).

Of necessity, Leroy (*1*) was only able to examine floral material from herbarium specimens of two parts of a flowering plant. We suggest that if, in fact, the material he examined is bicarpellary, had further material been available for examination, unicarpellate gynoecia might have been discovered. This suggestion is based on the observation (*7*) that, although most flowers of the reduced montane winteraceous species *Pseudowintera traversii* are unicarpellate, 15 percent have two carpels that, in material examined, are congenitally fused at their bases. In this plant, some immature fused carpels were found in which, at maturity, a unilocular syncarpous gynoecium would develop (*7*). Bicarpellate gynoecia in *P. traversii* have their carpels fused in a manner quite different from that proposed by Leroy for *B. perrieri*. In view of the significance of this plant, clarification of its gynoecial structure is essential.

SHIRLEY C. TUCKER
Department of Botany, Louisiana State University, Baton Rouge 70803
F. BRUCE SAMPSON
Department of Botany, Victoria University of Wellington, Wellington, New Zealand

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It is interesting that Tucker and Sampson did not reject the possibility of a unilocular bicarpellate gynoecium in the Winteraceae and point to their own observation of an incipient stage of it in *Pseudowintera*. What they found incipient and sporadic may well be the general condition elsewhere.

Bubbia species with short stigmatic regions have a continuous O-shaped placenta below their stigmas, whereas "*B*" *perrieri* has two separate placentas. Its stigmatic lobes are far from reminiscent of anything known to me in the Winteraceae. A detailed description of them has appeared elsewhere (*1*). What is surprising in this plant is not that it would have only one carpel, according to the Capuron's description, but that this carpel is erected and capped with two large stigmatic lobes opposite one another. In the opinion of Tucker and Sampson, it would seem premature to consider the two vertical grooves as representing sutures. Why then, do they give no explanation of these remarkable grooves, both of which occupy the place of ordinary sutures and are completely unknown in other Winteraceae. Tucker and Sampson argue that my figure 1B (*2*) perhaps does not show the dorsal side since no developmental study was made to ascertain the gynoecium interpretation. But if the two carpels are supposed to be centrally united, which is my hypothesis, where are the dorsal sides, if not in the plane perpendicular to the junction plan?

Even if one disregards this hypothesis, the enigmatic genus is worth considering as a subfamily of its own. Under my hypothesis, the Madagascan plant is no longer an enigmatic one. Moreover, contrary to Tucker and Sampson, the particular character of the inflorescence is not so much its specialized scales as its large development and its gradual formation from the vegetative zone. For all of these reasons, I feel I must hold to my first view. It is of course entirely possible that unicarpellate gynoecia are also found in "*B*" *perrieri*, as hypothesized by Tucker and Sampson. The question is then, How many stigmatic lobes would they have? The scantiness of the available material is of course deplored, and attempts are being made to have fresh material gathered in Madagascar for in-depth studies.

JEAN-F. LEROY
Ecole Pratique des Hautes Etudes, 16 Rue Buffon, 75005 Paris, France

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Difference Between Postpartum and Nutritional Amenorrhea

By the fact that it follows a pregnancy, postpartum amenorrhea reported by S. L. Huffman *et al.* (*1*) differs fundamentally from the secondary amenorrhea due to undernutrition that we described (*2*) in which weight loss below a threshold weight for height results in amenorrhea and failure to ovulate. Our weight and height data were obtained from anorectic and nonanorectic young women at the time of loss of normal cycling due to undernutrition and at the time of restoration of cycles after increased food intake. None of our subjects had ever conceived.

This confusion between nutritional amenorrhea and postpartum amenorrhea and the physical changes associated with each type would be clarified by longitudinal data on weight changes for individual women from parturition throughout the course of lactation (if present) to resumption of regular ovulatory cycles. These data are needed for each racial or ethnic group.

A woman who has become pregnant