We noted that all three viruses gave turbid plaques on BN1 lawns, which suggested that some cells were immune to lytic infection. From such turbid plaques on BN1 lawns infected with MVL1, two resistant clones were isolated and designated BN1 v1 and BN1 v2. Although selected for resistance to MVL1, both clones were also resistant to MVL52 and MVG51. Similarly, cells selected for resistance to MVL52 or MVG51 are also resistant to the other viruses. Adsorption studies show that the viruses do adsorb to the resistant cells. The possible lysogenic nature of these clones is indicated by preliminary studies which show that virus release from BN1 v2 can be induced by ultraviolet irradiation.

Four antibiotic-resistant cell populations were selected by the addition of antibiotics to the liquid culture medium. The cells isolated were resistant to (per milliliter) 400 μg of naladixic acid (BN1 Na1), 100 μg of kanamycin (BN1 Kan1), 40 μg of novobiocin (BN1 Nov1), or 500 μg of streptomycin (BN1 Sm1). When the three viruses were plated on these cells, it was found that BN1 Na1 and BN1 Kan1 supported viral growth, but none of the viruses was able to form plaques on lawns of BN1 Nov1 or BN1 Sm1. The plaques on BN1 Na1 were clear, as opposed to the turbid plaques on the parental BN1; hence, BN1 Na1 was used as the indicator lawn for measurements of virus titer. The mechanism of resistance to virus infection of BN1 Nov1 and BN1 Sm1, which were selected for antibiotic resistance, is not understood. Furthermore, the virus-resistant strains BN1 v1 and BN1 v2 have proved to be resistant to streptomycin. This suggests that perhaps Sm1, v1, and v2 may be ribosome protein mutations.

The viruses are able to form plaques on lawns which are 2 to 13 hours old. By 24 hours, a lawn is no longer able to support viral growth. No plaques were ever seen on unfected lawns. However, if old lawns (over 24 hours) were washed and plated on 6-hour lawns, a few plaques were sometimes seen. The numbers are too small to allow a statistical estimate of this frequency; for example, four of the washes from 36 old BN1 lawns gave rise to plaques on young BN1 lawns. Hence, host-carried virus must be considered in studies of Mycoplasmatales viruses. However, such viruses must not interfere with titer measurements due to the low frequency of spontaneous virus release, the time required for virus growth, and the short period during which the cells are susceptible to lytic attack. These same reasons probably account for the stability of the virus-cell relationship and for the difficulty in isolating the viruses.

In an effort to find other hosts, the ability of the three viruses to form plaques was examined on lawns of 73 Mycoplasmatales strains, consisting of 62 A. laidlawii, one M. hominis, one Mycoplasma sp. (from goat), five M. gallisepticum, and four Mycoplasma sp. strains avian serotype I. Plaques were observed only on 13 A. laidlawii lawns. The titers of the three viruses on six of these lawns, relative to their titers on BN1 Na1 lawns, is in Table 1. These data indicate a similar host range for MVL1 and MVG51, which is different from that of MVL52.

When lawns of the 13 strains, chosen for ability to grow MVL1, were washed, eight of the strains gave plaque-forming units. These data are summarized in Table 2. These eight new viruses give plaques on lawns of BN1 Na1 but not on BN1 v1, BN1 v2, or BN1 Sm1.

Of the 14 A. laidlawii strains examined thus far, we have isolated viruses from nine, or about 65 percent, of the strains. We do not know whether viruses could be isolated from the remaining strains by the use of other indicator lawns and we do not know whether such a high percentage of other species are carrying virus. Strain MVG51, isolated from a goat source, shows that other species can carry a virus. The original host of MVL1 is unknown. We also do not know whether the 11 Mycoplasmatales viruses (Table 2) are all different. At least three of them have different properties, although the three all appear to have the same morphology. Micrographs have also shown that MVL59 and MVL60 are also rod-shaped particles of similar size.

The prevalence of Mycoplasmatales viruses means that they must now be considered in investigations of Mycoplasma pathogenicity, both as etiologic agents and for their possible involvement in lysogenic conversion of the host Mycoplasma.

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References and Notes
5. G. S. Stent, Molecular Biology of Bacterial Viruses (Freeman, San Francisco, 1963), pp. 72–74.
8. We thank Dr. R. N. Gourlay for supplying us with A. laidlawii BN1 and MVL1 and for his suggestions on Mycoplasma virology; Dr. J. Fabricant for supplying the many Mycoplasma strains; Dr. J. Das and Dr. S. Bhattacharjee for helping us with the ultraviolet studies; Dr. J. R. Christensen and Dr. F. E. Young for teaching us about viruses; and Mr. David Gerling for his technical assistance. These studies were supported in part by grant AL839 from the National Institute of Allergy and Infectious Diseases, A.I. is a PHS predoctoral trainee, and J.M. is the recipient of a PHS research career development award.

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Radiohalos: Some Unique Lead Isotope Ratios and Unknown Alpha Radioactivity

Abstract. Previously unreported lead isotope ratios, that is, values for the lead-206/lead-207 ratio ranging from about 20 to 60, primarily radiogenic in origin but unsupported by uranium decay, have been determined in the inclusions of certain polonium halos by means of ion microprobe techniques. Evidence for radiogenic lead-208 unsupported by thorium decay may also be inferred from the existence of a composite polonium halo type with rings from the radioactive precursors of lead-208. Several new dwarf halo sizes seem to indicate the existence of unknown, very low-energy alpha-emitters. Furthermore, the three-ring "X halo" also provides evidence for an unknown series of genetically related alpha-emitters with energies in the range from 3 to 7 million electron volts.

An intriguing aspect of the study of radioactive halos (radiohalos) is the occurrence of unusual halo varieties (1–3), some of which remain unassociated with known α-emitters. There has been speculation of late that certain of these variant halos may be related to the existence of superheavy

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elements (4), and although no definite evidence presently exists in support of 
this hypothesis, investigations of a variety of radiohalo types have re-
vealed several new results that may be 
summarized as follows: (i) The ion 
microprobe mass spectrometer has 
been utilized to determine the Pb is-
otope ratios in the halo inclusions of 
radiohalos previously associated with 
a Po isotope decay sequence terminat-
ing with 206Pb. Several factors, including 
values for the 206Pb/207Pb ratio rang-
ing from about 20 to 60, suggest a 
unique history for the Pb in the Po halo 
inclusions as compared to that of pre-
viously observed lunar or terrestrial 

Pb (5, 6). (ii) A new type of com-
posite radiohalo has been found with 
rings attributable both to the 218Po de-
cay sequence and to 212Po and possibly 
212Bi. (iii) In addition to the dwarf 
halos (5.2 and 8.6 μm in radius) found 
by Joly (1), I have discovered a vari-
ety of dwarf halo sizes ranging from 1.5 
to 11 μm in radius. If we assume a ra-
dioactive origin, the extremely small 
halo sizes (1.5 to 2.5 μm) correspond to 
α energies, Eα, of approximately 1 Mev, 
less than that of any known α-emitters. 

In the past, identification of various 
radiohalo types was primarily depend-
ent upon a correlation of the halo ring 
radius with a specific α energy derived 
from a range-energy relation for the 
host mineral in which the halos oc-
curred. This technique was successful 
in identifying radiohalos that could 
easily be ascribed to α decay in the 
halo inclusion from the 238U and 232Th 
decay chains as well as radiohalos that 
apparently matched the sequential α-de-
cay patterns from 218Po (three rings), 
214Po (two rings), and 210Po (one 
ring). Although the ring structure of 
this latter group of radiohalos seemed 
perfectly compatible with the proposed 
Po isotopic designation (2), some 
questions have arisen over this identi-
fication because of the half-lives of the 
respective isotopes involved (t1/2 = 3 
minutes for 212Po) and the lack of evi-
dence for a secondary source of Po 
from α-decaying precursors in the U 
decay chain (7). Evidence in support 
of this identification is now available in 
the form of mass spectrometric analy-
ses of the Po halo inclusions made with 
the ion microprobe, a new type of mass 
spectrometer with a sputtering ion 
source (8), which makes possible an 
analysis of the halo inclusions in situ. 

The particular halo type analyzed 
possessed ring structure that correlated 
with the 218Po α-decay sequence (Fig. 
1A) which terminates with 206Pb and 
thus it was suspected that the halo in-
clusion would reflect an excess of 
206Pb when compared to previously ob-
served isotopic abundances of either 
common or radiogenic Pb. Such proved 
to be the case. In general, although 
variations were noted in the Pb iso-
otope ratios in the U and Th halo in-
inclusions, these ratios were within the 
range of previously reported values (5). 
In contrast, the Pb isotope patterns of 
the Po halos revealed ratios of 206Pb 
to 207Pb of ≈ 2.2 and of 208Pb to 207Pb 
of ≈ 19 for one inclusion and ratios of 
208Pb to 209Pb of ≈ 6 and of 206Pb to 
207Pb of ≈ 60 for a second inclusion. 
Uranium was virtually nonexistent in 
the first analysis and constituted only a 
small fraction of the Pb content in the 
second analysis (9). These results were 
confirmed when a different ion micro-
probe was used on a third Po halo in-
clusion (10), and the following ratios were 
observed: 206Pb/209Pb ≈ 33, 
206Pb/207Pb ≈ 20, 206Pb/204Pb > 1000, 
and Pb/Th and Pb/U > 5000, that is, 
no 204Pb, U, or Th was detected.

It is difficult to associate the Pb iso-
otope ratios and Pb/U and Pb/Th ra-
tios in these inclusions with any pre-
viously reported sources of terrestrial, 
meteoritic, or lunar Pb. For example, 
common Pb, as generally defined, refers 
to Pb assumed to consist of a primor-
dial component containing the isotopes 
204Pb, 206Pb, 207Pb, and 208Pb, and 
a radiogenic component containing the 
isotopes 206Pb, 207Pb, and 208Pb; how-
ever, the high Pb/U and Pb/Th values 
characteristic of phases containing com-
mon Pb imply that the radiogenic com-
ponent was not produced by in situ de-
cay of U or Th. Clearly then, the ab-


ence of or low abundance of U or Th 
in the third halo inclusion cannot of 
itself be taken as an indication of the 


presence of significant quantities of 
common Pb, since 204Pb was not de-
tected. Likewise, this Pb could hardly 
be characterized as radiogenic Pb in the 


sense of being derived from the in 
situ decay of U and Th, because these 
elements were absent. This Pb is, 


however, radiogenic in the sense of be-
ing derived from Po decay.

Additional evidence for an unusual 


history of these leads may be seen 
from the relatively high 206Pb/207Pb 
ratios, which for common Pb is about 
unity in many terrestrial rock types 
and for radiogenic Pb [produced by the 
in situ concurrent decay of 238U (to 
206Pb) and 235U (to 207Pb)] is in the 
range of ≈ 4 to 15 (5). The theoreti-
cal maximum possible radiogenic 206Pb/ 
207Pb ratio, on the basis of an in-
stantaneous production of Pb from U 
decay, would be 21.8. Thus the 206Pb/ 
207Pb ratios in the Po halo inclusions 
clearly differ from similar ratios pre-
viously observed either in common or 
in radiogenic Pb from U decay.

Rather than attempting to ascribe 
these unusual ratios to the general 
phenomenon of differential movement 
of U, Th, or Pb, I consider the evi-
dence in these specific cases to pro-
vide confirmation for the existence of 
206Pb from Po decay unsupported by 
U, especially in view of the fact that 
the highest value of the 206Pb/207Pb 

ratio (= 60) was recorded in the most 
densely colored Po halo of the three.

Further studies of this type may lead 
to a reevaluation of the basic premise 
that there is a unique origin for radi-
ogenic Pb, namely, that it originates 
solely from U and Th decay. Because 
of the small size of the halo inclusions 
(≈ 2 μm), such variations in Pb isotope 
ratios would easily have escaped prior 
detection with almost any other mass 
spectrometric techniques. Indeed, such 
variations may exist only in certain halo 
inclusions.

In a related context it appears that 
in certain cases small quantities of 
206Pb [and possibly 207Pb (11)] may 
have an origin similar to that of the 
excess 206Pb referred to in the above 
analysis. I have found a halo with 
rings consistent with the α-decay pat-
tern from 212Po and possibly 212Bi as 
well as the 212Po decay sequence (see 
Fig. 1, B and C). This halo and similar 
halos with rings from the α decay of 
212Po, 210Po, and 212Bi occur in very 
low abundance in the micas from the 
Faraday Mine near Bancroft, Ontario. 

By analogy with the above results, 
it would be expected that these com-
posite Po halos would exhibit a Pb iso-
topic ratio pattern high in 206Pb and 
208Pb without corresponding amounts of 
the parent nuclides 238U and 232Th. Indeed, 
at this time I cannot rule out the 
possibility that some of the 207Pb and 
206Pb (as well as the 208Pb) observed 
in the ion microprobe analyses might 
also have originated with Po or Bi de-
cay unsupported by U or Th. Halo 
rings from the radioactive precursors 
of 207Pb and 208Pb would not necessarily 
have formed as indicated by the lower 
abundance of these isotopes. In an 
earlier study no support was found for 
a secondary source of Po originating 
with α-decay precursors, that is, no 
variation in α-recoil density near the
halos. The rarity of the many years ago Joly (1) reported the existence of some very unusual dwarf halos with radii of approximately 5.2 and 8.5 μm in the black micas from the pegmatite quarry at Ytterby (near Stockholm). The halo with a radius of 5.2 μm was later tentatively associated with the decay of $^{147}$Sm ($E_a = 2.24$ MeV), whereas the larger halo has never received a satisfactory nuclide identification (12, 13). The extreme rarity of the occurrence of the dwarf halos apparently has precluded much research on the nature of their origin, and it has been only recently that I have found a few samples of mica from the old Ytterby quarry that contain any significant number of these unique halos for further study. Joly considered the radioactive origin of the halos beyond question and tentatively attributed their bleached appearance to an overexposed, radiation-damaged condition or perhaps to some other phenomena related to the metamorphic history of the mica. I consider the radiogenic origin to have been confirmed when Mahadevan (14) later reported equivalent dwarf halo sizes in an Indian cordierite sample, which also contained Po halos. Generally $\alpha$-particles from (n,$\alpha$) reactions are far too insufficient to produce a halo.

My observations on the dwarf halos are, in general, in accord with those of Joly, except that I have found several additional sizes that are somewhat difficult to account for on the basis of $\alpha$-decay systematics of known radioactive nuclides. I find that the smallest dwarf halos range from only 1.5 to about 2.5 μm with associated $\alpha$ energies in the range of approximately 1 MeV. The half-lives of known $\alpha$-radioactive nuclides are in excess of $10^{18}$ years for $\alpha$-decay energies of 2 MeV or less and thus normally correspond to such weakly active nuclides as to almost escape detection and would hardly be expected to produce a halo at all. These considerations do not seem in accord with the appearance of both some very small and some intermediate-sized dwarf halos, which show intense bleaching or reversal effects characteristic of a highly radiation-damaged region. The inference is that, whatever the difference in the half-lives of the nuclides responsible for the various dwarf halo sizes, the half-lives of the nuclides involved do not produce measurable differences in the degree of halo development.

Further, I have found other dwarf halos in the size range from 3 to 11 μm (see Figs. 2 and 3) corresponding to $\alpha$ energies ranging from approximately 1.1 to 3.4 MeV. The dwarf halos in this range do reflect some coloration differences which tentatively may be attributed to varying concentrations of parent radionuclides in the halo inclusions. Uranium and Th halos in a given hand specimen often exhibit similar effects for this reason. Although the dwarf halos which exhibit the most intense reversal effects have proved very satisfactory for radius measure-
ments ($\lambda \sim 0.25 \mu m$), the variety of sizes has thus far precluded the construction of a discrete radius distribution. (Some overlap in the distribution may result from the appearance of the same type of halo in later stages of development.) Generally speaking, the radius of an ordinary halo in the initial stages of development may vary a micrometer or two from that in later stages, possibly as a result of an increased ionization effect near the terminal range of the $\alpha$-particle in the mineral, and a reduced effect of this nature may be operating in the dwarf halos. Interestingly, there is a close correspondence between some of these halo sizes and some very low-energy $\alpha$-emitters ($E_{\alpha} = 1.1$ to $1.3$ Mev, $1.8$ to $2.0$ Mev, $2.5$ to $2.7$ Mev, and $3.1$ to $3.3$ Mev) of unknown origin observed over the last several decades by Schintziusmeister (15), Brukl et al. (16), and Gyssae (17). Whether there is a causal relation between the dwarf halos and these previously reported $\alpha$ activities is presently open to question. The significant result is that $\alpha$ activities in the range of a few million electron volts apparently exist apart from the naturally occurring, rare-earth $\alpha$-emitters with low decay energy (16, 17).

Further observations on the dwarf halos have shown some with an elliptical cross section as opposed to the ordinary circular cross section seen in thin section under the microscope. In certain cases this ellipticity arises from the fact that the long ($> 10 \mu m$) filament-like halo inclusion is inclined somewhat with respect to the cleavage plane. In other cases a shearing-type deformation of the crystal may have produced this effect, although it is not certain that either of these observations is the full explanation of this effect. Another observation I consider important is the presence of dual-ring dwarf halos, which must be considered similar in nature to other radiohalo types which exhibit ring structure, that is, U or Th halos. I believe that the rarity of the dual-ring dwarf halos implies that the nuclides involved are not necessarily genetically related in a decay sequence.

A most significant point is that the bleached regions immediately surrounding the inclusion etch extremely rapidly, a characteristic of highly radiation-damaged regions. The bleaching phenomenon exists in the same micas in overexposed U and Po halos. After etching thousands of these minute halos, I have found a few which exhibit fission tracks with a range of only about one-half to three-fourths the normal fission-track length. I was at first inclined to consider these tracks the result of lower-energy fission events but am as yet unable to rule out the possibility that they are U fission tracks that have been annealed somewhat through a metamorphic episode in the rocks. Since, however, fission-track measurements on these dwarf halos generally reveal a low content of U in the inclusions, an attempt was made to resolve their origin by searching for additional short-range tracks in unetched samples by means of high-voltage electron microscopy. Results have thus far been negative (18).

Equally as rare as the dwarf halos are the X halos reported by Joly (1) and later referred to by other investigators (5, 9, 12). I include a summary of Joly's measurements here. The inside ring may be somewhat diffuse and measures about 8.5 to 9.8 $\mu m$ in radius. The bleached rings extend out to a radius of approximately 14 to 15 $\mu m$ with an adjacent dark ring at about 17 $\mu m$, whereas the outer wide band extends to approximately 28 $\mu m$. Actually, two different types of X halos exist, one with and one without a bleached band. This particular halo is due neither to U nor to Th decay in spite of some close similarities with certain portions of the Th decay sequence. Rings in the X halo may be attributed to $\alpha$ energies of approximately 2.9 to 3.2 Mev (inner ring), 4.5 to 5.2 Mev (middle rings), and 6.8 to 7.0 Mev (outer ring). The chart of the nuclides reveals no genetically related $\alpha$ sequence corresponding to these energies, and it is extremely difficult to concoct a mixture of $\alpha$-emitters that would fit the above pattern without additional rings also being present.

Although an earlier suggestion relating the inner ring of the X halo to the spontaneous fission of U (19) is not tenable, the possibility of a combined fissiongenic and $\alpha$-derived origin for the inner ring involving other nuclides must not be overlooked. It seems clear that both the X halos and the dwarf halos may be evidence of presently unidentified $\alpha$ activity. Detailed ion microprobe studies of the halo inclusions may very well elucidate the nature of this activity.

**Note added in proof:** I recently visited several European research centers to investigate earlier reports of low-energy $\alpha$ activity cited in (15-17). F. Hernegger, Radium Institute, University of Vienna, carefully reviewed his collaborative efforts with Schintziusmeister.

Several of their unpublished reports written during World War II (20) give additional evidence of genetically related $\alpha$ energies of about 3.1 and 4.5 Mev—a interesting pattern when compared with the X-halo ring structure. G. Herrmann, University of Mainz, called my attention to the work of R. Coppons, University of Nancy, France, whom I subsequently visited. The low-energy $\alpha$ activity found by Coppons (21) and other earlier investigators (15-17) may be related to the radioactive origin of the dwarf halos.

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**References and Notes**


9. R. V. Gentry, paper presented at the Apollo 12 Lunar Science Conference, January 1971. A small U sign observed in this analysis, originating in the Po halo inclusion or in another inclusion nearby. This is in accord with my recent work (9). The fission tracks emanate from some Po halo inclusions, which is perhaps not surprising in view of the ubiquitous presence of Po. Even in these cases, however, the U content is anywhere from ten times to several thousand times less than the requisite amount of Po necessary for threshold coloration. The halos were in pegmatitic mica samples from Norway (Ireland district). These analyses were performed on the ion microprobe at Applied Research Laboratories, Goleta, California.

10. These analyses were made by J. McHugh on the new ion microprobe mass analyzer at the Knolls Atomic Power Laboratory. This mica sample was from a Canadian pegmatite.


12. G. Hervey and M. Pahl, ibid. 131, 434 (1933); J. J. Hoole, ibid., p. 654. Association of the 5.2-$\mu m$ band with $^{210}$Sm $\alpha$-decay is unconfirmed.


14. C. Mahadevan, Indian J. Phys. 1, 445 (1927); see also J. S. van der Lingen, Zentralbl. Minner. Abt. A 1926, 177 (1926). Through the courtesy of D. Lail and A. V. Bagayakar, Tata Institute of Fundamental Research, Bombay, I have recently received some cordierite samples from the location where Mahadevan obtained his material but have
Sexual Dimorphism in the Preoptic Area of the Rat

Abstract. A quantitative evaluation of the relative distribution of synapses on dendritic shafts and spines serves to differentiate the neuropil of the preoptic area from that of the ventromedial hypothalamic nucleus; it also shows that the neuropil of the preoptic area is sexually dimorphic.

There is considerable evidence that the tuberal part of the hypothalamus is involved in the maintenance of the basal level of output of gonadotrophins, and that the preoptic area is essential for initiation of the preovulatory surge of gonadotrophins which is typical of the adult female but which does not occur in the male (1, 2). The amygdala and the hippocampus together constitute the major source of fibers from the limbic forebrain to the hypothalamus (3). The amygdala has two principal efferent tracts; these are the stria terminalis, which among other areas projects to the preoptic area and to the ventromedial nuclei of the tuberal hypothalamus, and the ventral amygdalofugal pathway (4). There is evidence to suggest that the stria terminalis may be of special importance as a route for the effects of amygdaloid stimulation on ovulation (5, 6) and for the effects of the amygdala on the timing of puberty in the female rat (see 7).

Anatomically, therefore, the stria terminalis links the amygdala with the preoptic area and the tuberal hypothalamus, all areas that have been implicated in the control of gonadotrophin release. The aim of our investigations was to examine the synapses in the neuropil of those parts of the preoptic area and tuberal hypothalamus which receive strial projections and to identify the terminals of amygdaloid origin by taking advantage of the reaction of orthograde degeneration.

Lesions were made in the stria terminalis in the rat by use of a stereotaxically guided knife blade entering from the dorsal aspect of the brain, at a level 2.2 mm behind and to a depth of 5.5 mm below the bregma with the rat in a nose-down position. This lesion also destroys the fimbria and damages some adjacent structures. A previous study of the efferent projection of the hippocampus has established that these incidental parts of the lesion do not give rise to degeneration in either of the two specific areas examined in this study (8). Two days later the animals were killed, and the brains were fixed and processed for electron microscopy. Ultrathin sections from the levels of the preoptic area and the ventromedial nucleus were mounted on uncoated grids, whose mesh served to divide the region up into convenient sampling units of about 1800 μm². All the grid squares from the regions containing degenerating amygdaloid fibers were counted, and for each square every synapse was classified according to its site of termination on the postsynaptic element as well as by the presence or absence of degeneration of the presynaptic terminal. In general, the samples consisted of about 20 grid squares (700 synapses) taken from a single section, although in a few instances the same procedure was repeated at successive levels about 100 μm apart to ensure that there was no systematic variation. In these cases the ratios given in Table 2 are the means of the ratios at each level.

The maximum number of recognizably degenerating terminals is reached at about 2 days after section of their parent fibers, whereas the process of astrocytic phagocytosis is not sufficiently advanced to cause a major reduction in the number of terminals still in contact with their postsynaptic sites. Terminal degeneration is indicated by collapse and increased electron opacity of the axonal endings, and may be used as a reliable and quantitatively consistent marker of those terminals.

### Table 1. Total numbers of synapses of amygdaloid and nonamygdaloid origin on dendritic shafts (SH) and spines (SP) in samples taken from the preoptic area and the ventromedial nucleus of male (M) and female (F) rats. The total number of synapses counted was 28,184. The numbers of animals used were M = 10 and F = 8 for the preoptic area, and M = 6 and F = 6 for the ventromedial nucleus.

<table>
<thead>
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<th>Sex</th>
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<th>Nonamygdaloid</th>
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<td>SP</td>
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<td>F</td>
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<td>233</td>
</tr>
<tr>
<td>F</td>
<td>87</td>
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</tr>
</tbody>
</table>

### Table 2. Ratio of the number of nonamygdaloid synapses on dendritic shafts to the number on dendritic spines. Mann-Whitney U test was used for significance of difference between male and female: for the preoptic area, P < .001; for the ventromedial nucleus, difference is not significant (P = .5).

<table>
<thead>
<tr>
<th>Rat number</th>
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