tor hypersensitivity after destruction of certain noradrenergic terminals, and only partial depletion of NE in brain in our studies, may have combined to suppress differences in withdrawal symptoms between animals pretreated with 6-OHDA and those receiving control CSF [cerebrospinal fluid]" (*2*). Animals injected intraventricularly with 6-OHDA (50 μg) 48 hours before receiving pentylenetetrazol did exhibit a greater incidence of seizures compared to the appropriate control mice (*2*). Referring to the statement by Mason and Corcoran that barbiturate tolerance was measured in our studies (*1*) by quantitating the pentylenetetrazol-induced seizures, we point out that the pentylenetetrazol-induced seizures were used as a measure of central nervous system excitability and the presence of physical dependence on barbiturates in the barbiturate-withdrawn mice. We have previously stressed that tolerance to and physical dependence on sedative hypnotics are not identified phenomena (*2*, *3*), and here again we speak against synonymous use of the terms drug "tolerance" and "dependence."

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Carbon's High-Temperature Behavior

Whittaker (*1*) presented evidence for the occurrence of stable "carbyne" forms of graphite—forms that contain a triple bond—at temperatures above 2600 K. He also suggested that the Swing's bands of C_3 are not seen from carbon vapor at these high temperatures because of the presence of excited states of C_3 at low energy. These excited states would have to be forbidden to transitions from the ground state and must be such as to deplete the population of the ground state and decrease the intensity of the Swing's bands. A set of $^3\Pi$ states is suggested as a possibility (*2*). Considerable controversy has surrounded the spectroscopic and thermodynamic properties of C_3 in the past (*3*, *4*), and it is important to consider the possibility that previous ideas concerning C_3 may not be complete.

Whittaker's suggestion appears to be untenable. The Swing's bands do not decrease in intensity as the temperature increases. Painstaking experiments have shown that the Swing's bands form a pseudocontinuum at high temperatures and that the intensity of the continuum increases with temperature as does the C_3 concentration (*5*). Spectral observations at still higher temperatures can be used to draw conclusions about the population of the ground state only if the intensity of the continuum is taken into account. If new states of C_3 became populated at high temperatures, new features might be expected in the vibrational spectrum even though the new states were forbidden in the electronic spectrum. The infrared spectrum at about 3100 K has been examined, and it too is consistent with ground state C_3 (*6*).

The approximate energies of excitation of the excited states of C_3 have been calculated (*7*). The $^1\Pi_u$ state was calculated to be at 3.03 eV, in excellent agreement with the energy of the Swing's band. The $^3\Pi_u$ state was calculated to be at 2.04 eV, in agreement with weak bands found in the spectrum at 2.10 eV (*8*). These energies yield a population of less than 0.2 percent for the triplet states at 3000 K and about 1 percent at 4000 K. This population is much too small to make the spectra due to the ground state disappear.

It is possible that the $^3\Pi_u$ state is populated by a nonequilibrium mechanism. However, at these temperatures the saturation vapor pressure of C_3 is substantial [$> 10^{-4}$ atm at 3000 K and rapidly increasing as a function of temperature (*3*)] and collisions will rapidly establish equilibrium.

I conclude that the observations of the gas phase spectra cited by Whittaker provide no evidence for new forms of C_3.

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The published spectrum by Phillips and Brewer (*1*) shows the 405.0-nm band of C_3 at ~ 3000 K, but the spectrum taken at 3200 K by Brewer and Engelke (*2*) does not show this band. None of our spectra taken over the temperature range of 3500 to 4200 K show the 405.0-nm band, and a similar result was reported by Null and Lozier (*3*) and Howe (*4*). The remarks I made about the disappearance of C_3 emission were based on the behavior of the 405.0-nm band. A reexamination of our plates reveals a weak continuum starting at ~ 465.0 nm and extending at least to 360.0 nm, with a maximum at ~ 393.0 nm and a very weak band at 590.2 nm. These could correspond to the pseudocontinuum and the $^3\Pi$-$^1\Sigma$ transition of C_3. In this case, I must agree with Strauss that the behavior of C_3 emission provides no evidence for new states of C_3.

Apparently no new states are necessary to account for the triple-bonded carbon forms. A recent theoretical study of C_n molecules by Kertesz *et al.* (*5*) shows that models with alternating short and long bonds are energetically more stable than equidistant ones. This means that alternate bonds of all C_n molecules have some triple-bond character regardless of whether n is odd or even. In view of this, the remarks I made in my report about C_n molecules where n is even are not correct.

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