also possible that early crystallization of plagioclase grains causes them to be isolated from each other by later forming minerals such as quartz and potassium feldspar. Quartz, however, does not seem to affect the development of neighboring grains, and it also appears that no mineral affects the development of other mineral species (*1*).

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Note

1. This research was financed by the Harry Carothers Wiess fund of the department of geology of Rice Institute. We thank John M. Whitfield for helping to assemble the collection studied.

13 November 1957

On the Presence of 3-Hydroxytyramine in Brain

The compound 3-hydroxytyramine has attracted interest as a probable intermediate in the biosynthesis of noradrenaline and adrenaline and also as a possible neurohumoral agent. It has been shown to occur in the urine (*1*), in the adrenals (*2, 3*), and in the heart (*2*) of sheep and in the splenic nerve of the ox (*4*). The study of this compound has been hampered by lack of sensitive and specific assay methods. Apart from bioassay techniques, only the fluorimetric ethylenediamine condensation method of Weil-Malherbe and Bone (*5*) appears to be sufficiently sensitive for biological purposes. However, with this method the fluorescence spectra obtained from 3-hydroxytyramine and adrenaline are almost identical (*6*). In the fluorimetric method of Euler and Floding (*7*), the fluorescence obtained from 3-hydroxytyramine is very weak and amounts to only a few percent of that obtained from noradrenaline or adrenaline.

Recently we observed, however, that if the *p*H of samples prepared essentially according to this method was adjusted to about 5 by means of acetic acid, a fairly strong fluorescence developed. Furthermore, the activation and fluorescence peaks (345 and 410 mμ, respectively, as read in an Aminco-Bowman spectrophotofluorimeter) were at much shorter wavelengths than those obtained from noradrenaline and adrenaline, so that these compounds did not interfere, even if they were present in comparably large amounts.

Using this technique in combination with ion-exchange chromatography (Dowex 50), we have started to investigate the 3-hydroxytyramine content of various tissues. We have thus found that 3-hydroxytyramine is present in rabbit brain in an amount of about 0.4 μg/g, which is roughly equal to the amount of noradrenaline in this tissue. This may indicate that the function of 3-hydroxytyramine is not merely that of a precursor. The following criteria argue for the identity of the apparent 3-hydroxytyramine in brain with authentic 3-hydroxytyramine: (i) identical activation and fluorescence peaks, (ii) similar behavior on an ion-exchange column, and (iii) identical R_f values on paper chromatography.

Like noradrenaline (*8*), 3-hydroxytyramine is made to disappear almost completely from brain by intravenous injection of reserpine (5 mg/kg). On the other hand, the injection of the precursor 3,4-dihydroxyphenylalanine (150 mg of the DL form per kilogram, intravenously) caused a very marked increase in the 3-hydroxytyramine content of the brain (to about 2 μg/g in less than 1 hour). This was accompanied by central excitation (*9*). Both these phenomena were markedly enhanced by pretreatment with iproniazid (Marsilid). Simultaneous changes in the noradrenaline level of the brain were much less pronounced if present at all (*10*).

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4 November 1957

Upper Atmosphere Densities from Minitrack Observations on Sputnik I

The analysis of Minitrack (*1*) data on the first U.S.S.R. satellite, 1957 Alpha 2 (*2*) provides information on the density of the atmosphere (*3*) above the perigee altitude of 232 km. We find that the observed rate of change of period for Alpha 2 may be explained by a model atmosphere which is in agreement with recently obtained data on air density and temperature at altitudes (*4, 5*) up to ~200 km and constitutes a reasonable extrapolation of these measurements to higher altitudes. With allowance for the estimated probable errors in the density at 200 km and for the uncertainty in the orbit elements and ballistic drag parameter of Alpha 2, the data still yield a relatively unambiguous determination of density up to 400 km.

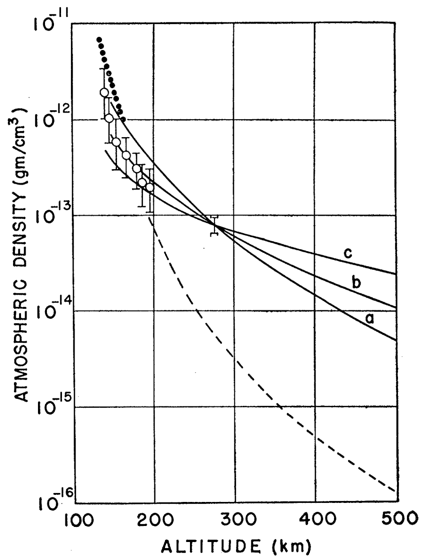

Fig. 1. Curves *a, b,* and *c* represent density distributions adjusted for simultaneous agreement with the rocket measurements and the α2 data. The dashed curve is the ARDC model atmosphere.

The determination of the density from the rate of change of the orbital period depends on the values of the ballistic drag parameter and the orbit constants of Alpha 2. The present calculations are based on a ballistic drag parameter of 89 ± 11 kg/m², derived from U.S.S.R. announcements of mass and area (*6*). The relevant orbit elements were deduced from Minitrack observations between 14 and 25 October, and their average values for that interval are as follows: perigee altitude = 232 ± 5 km; eccentricity = 0.047 ± 0.004; latitude of perigee = 39° ± 6°; equatorial inclination = 64.5° ± 0.3°; rate of change of period = 0.045 ± 0.003 min/day.

Our results are shown in Fig. 1. The solid lines represent three model atmospheres (*a, b,* and *c*) which agree with the rate of change of period of Alpha 2 and also fall within the limits of probable error in the rocket measurements of density up to 185 km. The data of Horowitz and LaGow (*4*) are indicated by circles, and the data of Byram, Chubb, and Friedman (*5*) by a dotted line. The dashed curve is the atmosphere proposed by Mizner and Ripley (*7*). The spread in the solid curves above 275 km indi-