Letters to the Editor

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NOTES ON POINTS IN SOME OF THIS WEEK'S LETTERS APPEAR ON P. 552.

CORRESPONDENTS ARE INVITED TO ATTACH SIMILAR SUMMARIES TO THEIR COMMUNICATIONS.

Oxygen Content of the Stratosphere

AIR from different heights of the stratosphere was brought down by registering balloons by means of a new device for air sampling. As the apparatus was protected against the low air temperature in the stratosphere by a "Cellophane" case, it was possible to employ ordinary stop-cocks. At the desired heights the latter were operated by an electrical arrangement actuated by aneroids. The glass vessels for air sampling were constructed so that the oxygen content could be determined in them by means of heating metallic copper without it being necessary to change the vessel. Before and after heating the copper the volume was brought to the same level, so that the diminution of pressure divided by the initial pressure immediately gives the oxygen content.

The following table gives the values obtained for the oxygen contents :

Date	Height (km.)	Oxygen content (per cent by vol.)
24. 8.36	0	20·92 ± 0·02
19.12.35	14·5	20·89 ± 0·05
5.12.35	18·5	20·84 ± 0·02
18. 8.36	19	20·87 ± 0·02
5.12.35	22·2	20·57 ± 0·05
12. 2.36	24	20·74 ± 0·02
6. 5.36	28–29	20·39 ± 0·05

In approaching the height of 20 km. the oxygen content is diminished noticeably in comparison with the value at the earth's surface (20·90–20·95 per cent); above 20 km. the diminution begins to be more pronounced; at the greatest height there is a deficit of 2–3 per cent of the oxygen content. The values agree with the determination of the helium content of the stratosphere by F. Paneth[1], who at a height of 21 km. finds a helium surplus of 8 per cent.

It is remarkable that at heights greater than 20 km. the values differ rather considerably. This is probably due to the weather conditions. In air masses of polar origin it seems that the diffusive separation begins at lower heights than in equatorial regions where the top of the troposphere is remarkably higher. The insolation in equatorial regions is very much stronger, and the turbulence of the atmosphere reaches to greater heights. Lepape and Colange[2] also find that the content of helium plus neon in the stratosphere is slightly increased, and more variable than on the earth's surface. If my assumption is true, then the height of the ozone layer in the stratosphere should also be lower in polar regions than in equatorial regions, first, because the oxygen content in polar regions decreases with heights more rapidly than in equatorial regions, and secondly—which is perhaps of even greater effect—because the greater stability of the atmosphere in the polar regions tends to increase the diffusion of the heavy ozone downwards.

A more detailed report will be published shortly in *Luftfahrtforschung*.

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Sept. 6.

[1] F. A. Paneth and E. Glückauf, NATURE, **136**, 717 (1935).
[2] A. Lepape and G. Colange, NATURE, **137**, 459 (1936).

Absence of Cosmic Rays from Nova Lacertæ

THE appearance of Nova Lacertæ gave us a second opportunity of investigating whether the conclusion at which we arrived when investigating the relation of Nova Herculis to cosmic rays[1], namely, that no cosmic rays emitted from novæ are observable, was correct or not. For this purpose we have turned the centre line of the field of our apparatus (field of the apparatus : 40° in east-west, 10° in north-south direction ; 36 cm. lead between the counters) as soon as the outburst of the nova was signalled, into such a position that the centre line showed only an angle of 2° 09′ north of the nova at culmination. In such a position a set of measurements was performed from June 19 until July 17, 1936.

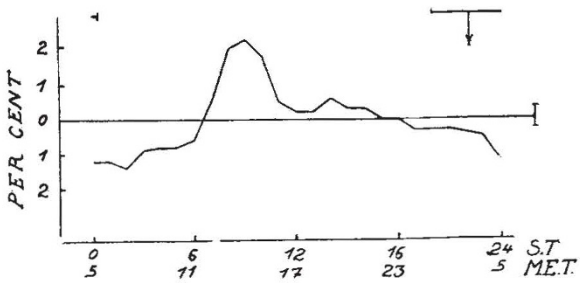

FIG. 1. Variation of cosmic ray intensity (average values) with sidereal time (S.T.) and Central European time (M.E.T.). The horizontal straight line above the diagram indicates the time during which Nova Lacertæ passed through the field of our apparatus, and the arrow the time of its culmination.

Fig. 1 shows the average variation of the intensity for the different hours of the day, as a percentage of the mean value. As can be easily seen, the curve indicates only the well-known diurnal variation, and no increase at the time of culmination of the nova. The assumption that no effect of the nova was detectable, because its cosmic radiation was of much shorter period than the duration of the measurement, cannot be maintained, for even the ratio of the