emulsion for different track lengths; (3) variation of (n, p) scattering cross section with energy.

Table I shows the total correction factor that must be applied

TABLE I. Correction factors for neutron groups.

Neutron group / Proton energy	Main group ground state A	205 kev C	428 kev B	745 kev D
2.705 Mev	1	0.55	0.25	—
3.120 Mev	1	0.67	0.38	0.16

to each of the groups before determining their relative intensities.

Using the correction factors of Table I the intensity of the 428-kev group relative to the main group is 0.08 ± 0.02 for both sets of data. If there is a group at D there are only two tracks in the data which could correspond to this group. The relative intensity is found to be less than one percent. It is difficult to decide whether there is a group corresponding to the points marked C. The number of tracks that can be assigned reasonably to such a group in each case is no more than could be considered to be background. In each set of data there are about six tracks that may be considered to be in such a group. The relative intensity would be five percent of the main group if all of these did arise from a level at 205 kev in each set of data.

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The $3\nu_3$-Band of Telluric CO_2 in the Solar Spectrum*

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OBSERVATION of the lines of the $3\nu_3$-band of telluric CO_2 that appear in the solar spectrum is possible only when the earth's atmosphere is very dry. Numerous strong lines of the 0 2 1, 1 0 1, 1 2 0, and 2 0 0 bands of H_2O occupy the same wave-length region. One of the results of guest investigator arrangement between the Mount Wilson and Palomar Observatories and the McMath-Hulbert Observatory, for the direct-intensity recording of the solar spectrum, is a spectrophotometric tracing made on an exceptionally dry day (December 20, 1949), at Mount Wilson, California. The weakened H_2O absorption unmasks many lines of the $3\nu_3$-band of CO_2.

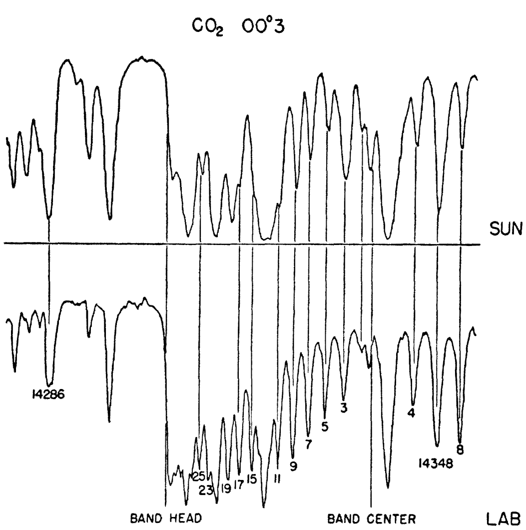

FIG. 1. The $3\nu_3$-band of CO_2 in the solar spectrum, with laboratory comparisons.

The top half of Fig. 1 is a part of this record; the bottom half is a laboratory comparison. The intensity increases upward from the straight line below each tracing. Broken lines connect corresponding features of the two tracings and indicate the positions of the band head and band center. The numbers 14,286 and 14,348 are the wave-lengths in angstroms of the absorption lines immediately above them. Beneath the CO_2 lines in the laboratory tracing are the upper quantum numbers for the lines in the short wave-length branch, and the lower quantum numbers for the lines in the long wave-length branch of the band.

14,308A(H_2O) and 14,313A(H_2O) complicate the strong CO_2 band head at 14,305A in the solar spectrum, and the line at 14,338A(H_2O) obscures the band center. On all tracings obtained up to December 20, 1949, H_2O lines completely mask the analogous isotopic ($C^{13}O_2^{16}$) band head at 14,700A.

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A Precise Determination of the Energy of the Cs^{137} Gamma-Radiation*

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FOR the absolute calibration of nuclear spectrometers, it has become common practice to make use of the photo-electrons ejected from a radiator or the internal conversion electrons resulting from a gamma-ray of known energy. Since the shape of photo-lines depends somewhat on the position of the source relative to the radiator and also on the thickness of the radiator, the use of an internal conversion line appears to be preferable. Although the energy of the Au^{198} gamma-ray has been measured with great precision,[1] the relatively short half-life provides a calibration source of only temporary utility. It is felt that the conversion electrons from the 0.66-Mev gamma-ray which follows the disintegration of Cs^{137} provide a much more suitable calibration standard. The 33-year half-life makes possible the preparation of an essentially permanent laboratory source of monoenergetic electrons. There is also the advantage that the conversion line lies at a higher energy and is completely separated from the main nuclear beta-spectrum. In an attempt to establish Cs^{137} as a calibration standard, the energy of the internal conversion electrons has been carefully determined by direct comparison with that of the 0.4112-Mev gamma-ray of Au^{198}.

The measurements were made with the 40-cm radius of curvature, 180 degree focusing, shaped magnetic field spectrometer.[2] A composite source of Au^{198} and Cs^{137} was prepared on a 0.00025-in. Al backing. The source was 0.25 cm wide and 2.5 cm high and was spread with the aid of insulin. An electrically grounded source of mechanical permanence was thus obtained. The scattering from the aluminum backing causes only a slight broadening of the lines and does not affect the energy determinations which are made in terms of the extrapolation of the high energy edges. The source thickness was estimated to be 0.03 mg/cm² of Au^{198} and 0.1 mg/cm² of Cs^{137}.

Figure 1 shows a typical momentum distribution curve of the electrons which are internally converted in the K shells of Hg^{198} and Ba^{137}. For these measurements, the detecting slit was 0.40 cm wide and the distance between the center of the source and the center of the slit was $2\rho = 80.58$ cm. In determining the energy