tive to the relative Σ-Λ parity. Both experiments are quite difficult from the standpoint of the accumulation of statistics alone. One might still try to appeal to a dispersion relation at this point. Consider elastic π^0-Λ scattering. A dispersion relation for this process with no subtraction may be written

$$D_0(\omega)=\alpha+(1/2\pi^2)\int_0^\infty K'^2dK'\sigma_0(K')/(K'^2-K^2), \quad (4)$$

where D_0 is the forward scattering amplitude and σ_0 is the total cross section; α is given by $\alpha=-2b^2\omega_0/(\omega^2-\omega_0^2)<0$ for negative relative Σ-Λ parity and $\alpha=[2b^2/(M_1+M_2)^2][\omega_0(\mu^2-\omega_0^2)/(\omega^2-\omega_0^2)]>0$ for positive relative Σ-Λ parity. Here μ is the pion mass, $\omega_0=(M_2^2-M_1^2-\mu^2)/2M_1\sim 70$ Mev, and b is the renormalized coupling of a pion to a Σ and a Λ. Only the Σ^0 intermediate state contributes to α. We cannot scatter pions on hyperons directly, but two potentially useful reactions that produce high-energy and low-energy pion-hyperon states, respectively, are $K^-+p\rightarrow\Lambda+\pi^0$ and $K^-+p\rightarrow\Lambda+\pi^0+\pi^0$. It may be that future experiments on these reactions together with a theoretical analysis could determine the sign of the low-energy scattering length in the Λ-π^0 system.

Finally, we note that Eq. (3), as well as Eq. (2),[2-4] is consistent with renormalized K-meson couplings with $g^2\sim 1-4$.

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[1] K. Igi, Progr. Theoret. Phys. (Japan) 19, 238 (1958).

[2] C. Goebel, Phys. Rev. 110, 572 (1958).

[3] P. T. Matthews and A. Salam, Phys. Rev. 110, 569 (1958).

[4] K. Igi (to be published).

[5] M. L. Goldberger, Phys. Rev. 99, 979 (1955).

[6] Goldberger, Miyazawa, and Oehme, Phys. Rev. 99, 986 (1955).

[7] If the relative Σ-Λ parity were determined, by some other method, to be negative, then relation (3) could test whether there is an important inequality in these renormalized couplings [S. Barshay, Phys. Rev. 110, 743 (1958)] .

[8] Igi notes that if the K^+-p cross section in fact increases from ~6 mb at 0 kinetic energy to ~17 mb at ~100 Mev then F is still negative if the K^--p effective potential is repulsive, but F is positive if the potential is attractive. The entire annalysis rests on the validity of a reasonably smooth extrapolation of $A_-(\omega)$ into the unphysical region.

[9] S. Barshay, Phys. Rev. Lett. 1, 97 (1958).

[10] A. Pais and S. Treiman, Phy. Rev. 109, 1759 (1958).

[11] G. Feinberg, Phys. Rev. 109, 1019 (1958).

[12] G. Feldman and T. Fulton (to be published).

ANTI-LAMBDA HYPERON*†

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An event has recently been found in an emulsion stack exposed to a 4.6 ± 0.3 Bev π^--meson beam at the Berkeley Bevatron which is interpreted as the decay of an anti-lambda hyperon, $\bar{\Lambda}^0$. The threshold for production with a free nucleon is 4.73 Bev and extends down to ~ 4.3 Bev with a bound nucleon, the production reaction being of the type

$$\pi^-+p\rightarrow\Lambda^0+\bar{\Lambda}^0+n.$$

The side of the stack was exposed to a beam of 10^6 π mesons per sq cm, the intensity falling off by a factor of 10^3 in a distance of 8 in. across the emulsion sheets. The emulsions were scanned for stopping π^+ mesons and these were followed back to their origins if it appeared that they were produced in the region of high π-meson flux. Most tracks which were successfully traced back came from primary π^--meson stars but 3 traced back to decaying K^+ mesons and one to a "V" type event. The event is shown in Fig. 1. The other branch of the "V" event was traced after 3 cm range into a large star from which 3 shower particles were emitted. The visible energy in this star is 783 Mev including the rest masses of the 3 shower particles which were all identified as π mesons; one was arrested and decayed into a μ meson, the other two were identified by the Δg^* vs ΔR and by the $\bar{\alpha}$ vs g^* methods.

The particle connecting the "V" event with the large star has been shown to have been traveling into the star rather than the reverse by ionization measurements on the track. These are summarized in Table I. Every useful grain in the track has been counted and the plateau ionization in each plate has been determined by measuring the beam π mesons. The grain den-

Table I. Details of ionization measurements on the antiproton track.

Plate	Total corrected range	Range counted	No. grains	Minimum	g^*	Effective range from $\bar{\Lambda}^0$-decay
1	2.78 mm	2.27 mm	718	15.00	2.104	1.13 mm
2	5.88	4.72	1572	15.51	2.150	5.72
3	6.59	5.11	1780	15.62	2.230	11.98
4	6.78	5.42	1890	15.39	2.260	18.67
5	5.09	4.56	1601	15.19	2.316	24.84

sities have then been normalized to the minimum ionization value via the plateau[1] in each plate. It is clear that the track increases in ionization towards the star. The star has therefore been identified as an antiproton interaction in flight. The best value of the antiproton energy at the decay point is 230_{-7}^{+22} Mev. The opening angle of the V is $64 \pm 1°$ and the π^+-meson energy is 32 Mev from a range of 1.70 cm in emulsion.[2] From these values the Q value in the decay has been calculated to be $35_{-0.9}^{+2.6}$ Mev, this is in excellent agreement with that for the normal Λ^0 hyperon: 37.45 Mev.[3]

One cannot of course completely rule out the possibility that the decay event is really the interaction of an antineutron charge-exchanging

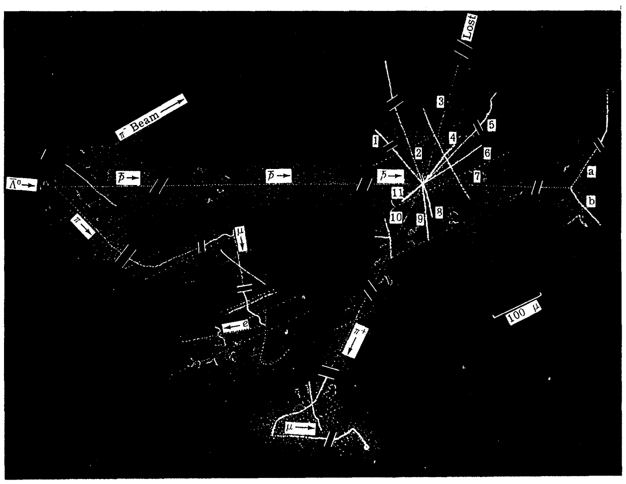

FIG. 1. Drawing of the event. The $\bar{\Lambda}^0$ hyperon enters from the left in the direction indicated. The antiproton track is shown and is almost horizontal. The star apparently caused by the interaction of the antiproton in flight has 11 prongs, all but one of which have been arrested in the emulsion. Of the three shower tracks, one interacts in flight and a second decays at rest. The π^+-meson track resulting from the decay of the antihyperon is shown decaying into a μ meson and thence to an electron.

into an antiproton and also creating a π^+ meson, but the visible energy in the star, coupled with the direction of the connecting track and the apparent Q value in the decay, makes the $\bar{\Lambda}^0$ hyperon the only reasonable interpretation.

We would like to thank Dr. E. J. Lofgren and his colleagues at the Bevatron for making the exposure possible. We are grateful to Professor D. H. Wilkinson and Dr. W. Chupp who carried out the exposure. We are indebted to Professor C. F. Powell, Professor N. Dallaporta, Dr. D. Evans, Dr. D. H. Stork and Professor W. F. Fry for many very useful discussions.

*A very preliminary report of this event was made at the Washington Meeting of the American Physical Society in May, 1958 [M. Baldo-Ceolin and D. J. Prowse, Bull. Am. Phys. Soc. Ser. II, 3, 163 (1958)]. A more detailed account than is given in this letter will be published elsewhere.

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‡On leave from the University of Bristol, Bristol, England.

[1] G. Alexander and R. H. W. Johnston, Nuovo cimento 5, 263 (1957).

[2] Barkas, Barrett, Cuer, Heckman, Smith, and Ticho, Nuovo cimento 8, 186 (1958).

[3] W. H. Barkas, Proceedings of the Padua-Venice Conference on Mesons and Recently Discovered Particles, 1957 (to be published).

BERYLLIUM-7 EXTREME HIGH-TEMPERATURE EXPERIMENT

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The recent attainment of extreme high temperatures of milliseconds duration suggests a rather interesting experiment.[1] It is known that Be^7

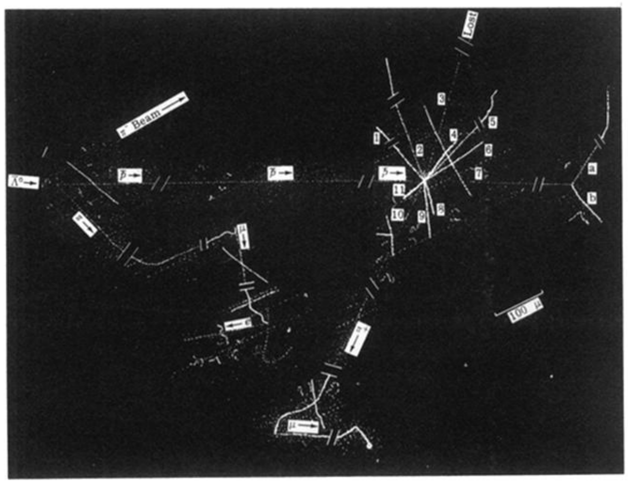

FIG. 1. Drawing of the event. The $\overline{\Lambda}^0$ hyperon enters from the left in the direction indicated. The antiproton track is shown and is almost horizontal. The star apparently caused by the interaction of the antiproton in flight has 11 prongs, all but one of which have been arrested in the emulsion. Of the three shower tracks, one interacts in flight and a second decays at rest. The π^+-meson track resulting from the decay of the antihyperon is shown decaying into a μ meson and thence to an electron.