PROJECT 10073 RECORD CARD

1. DATE: 30 Nov 1963	2. LOCATION: Knoxville, Tenn	12. CONCLUSIONS ☐ Was Balloon ☐ Probably Balloon ☐ Possibly Balloon ☐ Was Aircraft ☐ Probably Aircraft ☐ Possibly Aircraft ☒ Was Astronomical Meteor ☐ Probably Astronomical ☐ Possibly Astronomical ☐ Other ☐ Insufficient Data for Evaluation ☐ Unknown
3. DATE-TIME GROUP Local 4.17AM GMT 30/0917Z	4. TYPE OF OBSERVATION ☒ Ground-Visual ☐ Ground-Radar ☐ Air-Visual ☐ Air-Intercept Radar	
5. PHOTOS ☐ Yes ☒ No	6. SOURCE: Civilian & Military (Air)	
7. LENGTH OF OBSERVATION: Not Given	8. NUMBER OF OBJECTS: 1	9. COURSE: Not Given
10. BRIEF SUMMARY OF SIGHTING Football with tail at estimated 2,000 ft. Red, Flue and green trailing fire. In flight to NE. B-52 crew evaluated object as meteor.	11. COMMENTS Meteor.	

ATIC FORM 329 (REV 26 SEP 52)

[redacted]

Department of the Air Force
Office of Public Information
The Pentagon
Washington, D.C. 20301

Dear Sirs:

The following Unidentified Aerial Phenomenon sighting was reported in the Sunday Knoxville News-Sentinel newspaper on December 1, 1963:

LOW, FLAMING OBJECT IS AREA MYSTERY

A flaming object shooting through the skies early yesterday morning has deputies mystified.

Deputies William Martin and John Maples said they were on Clinton Highway at 4:17 a.m. when an object that looked like a football with a tail on it sped over the top of them at about 2000 feet in height.

"It was brilliant red, blue and green, on fire, and had what looked like streams of sparkling lights around it," Deputy Maples said.

He said it was going from southwest to northeast and disappeared in the east.

Two deputies on patrol in East Knox County saw the same thing and a U. S. Air Force B-52 crew, flying over Knoxville at 35,000 feet at that time, saw a similar object that quickly disappeared. The crew surmised it was a meteor.

Several other persons saw the aerial phenomena at the same time.

Earlier, at 2:10 a.m., some tourist passing through Oak Ridge saw a similar object and called Anderson County deputies about it.

Charles Martin, head of the National Investigative Committee of Aerial Phenomena in this area, said from the description it didn't sound like a meteor. "Meteors," he said, "always look as if they are shooting downward at a rapid rate and never have I heard of one flying along horizontally."

His volunteer unit is investigating.

Personally, I believe the object was either (a) a meteor, particularly of the brilliant fireball type, or else (b) the decay and re-entry of an artificial earth satellite.

Do your scientific experts think it might have been a meteor or satellite? If they have not previously received this report, please have them analyze it and also check on the re-entry of artificial satellites to see if it could have been that.

Please send me the official U.S. Air Force conclusions as to the identity of this object or phenomenon. Please answer and send me two copies of your answer, if possible.

Sincerely yours,

[redacted]

[redacted]
Knoxville, Tenn. 37914

KNOXVILLE 2 TENN
DEC 6 3 PM 1963

Department of the Air Force
Office of Public Information
The Pentagon
Washington, D. C. 20301

HEADQUARTERS
FOREIGN TECHNOLOGY DIVISION
AIR FORCE SYSTEMS COMMAND
UNITED STATES AIR FORCE
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

REPLY TO
ATTN OF: TDEW

SUBJECT: UFO Sighting ([redacted])

13 DEC 1963

TO: Hq USAF SAF-OIPB (Mrs Gaiser)
Wash 25 D C

1. Reference the attached letter from [redacted], dated 2 Dec 63, requesting information on a UFO sighting, 30 Nov 63, over Tennessee and Kentucky. The sighting is attributed to a meteor. The information which Mr [redacted] has given Mr [redacted] is obviously in error. Meteors can and do travel horizontally and on occasion may even appear to rise. The book The World of Flying Saucers, authored by Doctors Boyd and Menzel, has an excellent chapter on meteors which indicates some of the appearances that meteors have taken.

2. Satellite decay (or re-entry) is distinguished from meteors by:

a. The re-entry always has an Easterly component.

b. The colors tend toward reds and oranges on the color spectrum as the object breaks up or decays.

c. The duration of satellite decay is much longer. Sputnik IV decay on 5 Sep 62 lasted in excess of two minutes and the Discoverer VIII decay on 7 Mar 60 lasted over four minutes, whereas meteors are rarely observed for over ten or fifteen seconds.

d. The speed is much slower for satellite decay as compared to speeds of meteors.

FOR THE COMMANDER

ERIC T de JONCKHEERE
Colonel, USAF
Deputy for Technology
and Subsystems

1 Atch
Ltr [redacted],
dtd 2 Dec 63

1 Dec 63

December 30, 1963

Dear Mr. [redacted]:

This is in reply to your letter of December 2, 1963, in which you request the official Air Force conclusion on an Unidentified Aerial Phenomenon which was reported in the Knoxville News-Sentinel newspaper on December 1st.

The sighting reported is attributed to a meteor. Contrary to information given you, meteors can and do travel horizontally and on occasion may even appear to rise. The book "The World of Flying Saucers" by Menzel and Boyd, has an excellent chapter on meteors which indicates some of the appearances that meteors have taken.

Satellite decay (or re-entry) is distinguished from meteors by the fact that the re-entry always has an easterly component; the colors tend toward reds and oranges on the color spectrum as the object breaks up or decays; the duration of satellite decay is much longer (Sputnik IV decay on September 5, 1962 was in excess of two minutes, and the Discoverer VIII decay on March 7, 1960, lasted over four minutes, whereas meteors are rarely observed for over ten or fifteen seconds); and the speed is much slower for satellite decay as compared to speeds of meteors.

Sincerely,

MASTON M. JACKS
Major, USAF
Public Information Division
Office of Information

Mr. [redacted]
Knoxville, Tennessee 37917

[redacted]
Knoxville, Tenn. 37917
October 21, 1963

Department of the Air Force
Office of Public Information
The Pentagon
Washington, D. C.

Dear Sirs:

I have some questions I would like answered:

(1) Why is the truth about flying saucers being hidden from the public? In a democracy the people have a right to know. Congressional hearings will reveal the truth, sooner or later.

Please send me all information on saucers available to the public(free data, that is). Fact sheets, questionnaires, AFR 200-2, JANAP 146 and other secrecy orders.

(2) Please tell me why the U.S. Air Force has not exposed the Lunik, "launched" January 2, 1959, as a hoax. Science writer Lloyd Mallan proved it was a hoax way back in 1959. Why hasn't the Air Force made some statement telling everone that a grandious hoax has been perpetrated on the Free World.

Sincerely yours,

[redacted]

POWER, David

October 25, 1963

Dear Mr. [redacted]r:

This is in response to your letter of October 21, 1963, in which you request information concerning "Flying Saucers." Unidentified Aerial Phenomena is the proper terminology for the subject.

We are pleased to inclose two brochures which we think may be of interest to you. The Air Force disseminates all available information to all who request it, on an impartial basis. No information which is vital to the public in understanding or evaluating unidentified aerial phenomena is withheld or censored. The results of all Air Force investigations are now and always have been available to bona fide news representatives and scientific researchers.

Inclosed also is a copy of AFR 200-2, which sets up the UFO program and explains its method of operation.

We suggest that you read "The World of Flying Saucers" by Menzel and Boyd, recently published by Doubleday. This book should serve to answer many queries and dispel any misinformation you may have on this subject.

Sincerely,

MASTON M. JACKS
Major, USAF
Public Information Division
Office of Information

Mr. [redacted]
[redacted]
Knoxville, Tennessee 37917

[redacted]
December 17, 1963

Dear Sirs:

You say that no evidence or data has been found to prove the existence of flying saucers. You also say that anyone possessing such information should submit it for analysis.

Please tell me exactly what evidence or data the Air Force would consider to be proof of the existence of extraterrestrial space ships in our atmosphere. What evidence would cause the AF to officially announce the presence of space ships in our atmosphere?

What WOULD be considered PROOF?

Please answer and send me two copies of your answer, if possible.

Sincerely yours,

[redacted]

Department of the Air Force
Office of Public Information
The Pentagon
Washington, D.C. 20301

NO CASE (INFORMATION ONLY)
SAUCER NEWS, VOL II, MAR 64

Knoxville, Tennesee
30 NOV 63

...On the night of November 30th (1963) a mysterious flaming object was seen shooting through the skies near Knoxville, Tennessee, by two sheriff's deputies. They said that they saw something which looked like a "football with a tail on it" speed over them at an altitude of about 2,000 feet. A U. S. Air Force B-52 crew, flying over Knoxville at 35,000 feet at that time, saw the same UFO....

UNIVERSITY of PENNSYLVANIA

PHILADELPHIA 4

Flower and Cook Observatory

196? Dec. 12

Exe utive Officer,
Public Information Division,
Office of Information Service,
Department of the Air Force,
Washington, D.C.

Dear Sir:

Two very brilliant fireballs appeared over Pennsylvania on May. 27 at 6:05 p.m.EST and on Dec.7 about 5:40 .m. EST.

Many reports, particularly on the former, have come in and I wish to compute the paths and orbits of both.

If reports on either or both of these fireballs have been sent in to you, would you be kind enough to send me copies of them ?

If paths can be computed, proper acknowledgement will be given to the Air Force for any reports you can send me.

Very truly

Charles P. Olivier

Charles P.Olivier, Pres.
American Meteor Society,
521 N. Wynnewood Ave.,
Narberth, Pa.

19072

December 16, 1963

Dear Mr. Olivier:

This is in response to your letter of December 12, 1963, in which you request any reports the Air Force may have received on two fireballs which individually appeared over Pennsylvania on November 27th and December 7th.

The Foreign Technology Division advises us that they have not received any reports on this phenomena up to the present time. However, it may be a little early yet for the December 7th sighting to have reached their office. They advise us that they will send this Headquarters any and all reports of these sightings they may received, and in turn we will forward them to you immediately.

As a matter of information, the Foreign Technology Division does have quite a few reports of the sighting of a fireball in the Phoenix, Arizona area on November 19th. If you are interested in these, we will be glad to send them to you.

Sincerely,

MASTON M. JACKS
Major, USAF
Public Information Division
Office of Information

Mr. Charles P. Olivier
President,
American Meteor Society
521 N. Wynnewood Avenue
Narberth, Penna. 19072

OFFICIAL U.S. AIR

U.S. AIR FORCE TECHNICAL INFORMATION

This questionnaire has been prepared so that you can give the U.S. Air Force as much information as possible concerning the unidentified aerial phenomenon that you have observed. Please try to answer as many questions as you possibly can. The information that you give will be used for research purposes. Your name will *not* be used in connection with any statements, conclusions, or publications without your permission. We request this personal information so that if it is deemed necessary, we may contact you for further details.

1. When did you see the object?

? (Day) | November (Month) (winter) | 1963 (Year)

2. Time of day: _____ Hours _____ Minutes

(Circle One): A.M. or (P.M.)

3. Time Zone:

(Circle One): (a. Eastern)
b. Central
c. Mountain
d. Pacific
e. Other _____

(Circle One): a. Daylight Saving
(b. Standard)

4. Where were you when you saw the object?

LINWOOD (Nearest Postal Address) | LINWOOD (City or Town) | N. J. (State or County)

5. How long was object in sight? (Total Duration) _____ Hours 15 Minutes _____ Seconds

(b. Fairly certain)
a. Certain
c. Not very sure
d. Just a guess

5.1 How was time in sight determined? By WRIST Watch

5.2 Was object in sight continuously? Yes ✓ No _____

6. What was the condition of the sky?

DAY	NIGHT
a. Bright	a. Bright
b. Cloudy	(b. Cloudy)

7. IF you saw the object during DAYLIGHT, where was the SUN located as you looked at the object?

(Circle One):
a. In front of you
b. In back of you
c. To your right
d. To your left
e. Overhead
f. Don't remember

FORM FTD OCT 62 164 This form supersedes FTD 164, jul 61, which is obsolete.

R FORCE UFO FORM

8. IF you saw the object at NIGHT, what did you notice concerning the STARS and MOON?

8.1 STARS *(Circle One)*:

a. None
b. A few
c. Many
d. Don't remember

8.2 MOON *(Circle One)*:

a. Bright moonlight
b. Dull moonlight
c. No moonlight—pitch dark
d. Don't remember

9. What were the weather conditions at the time you saw the object?

CLOUDS *(Circle One)*:

a. Clear sky
b. Hazy
c. Scattered clouds
d. Thick or heavy clouds

WEATHER *(Circle One)*:

a. Dry
b. Fog, mist, or light rain
c. Moderate or heavy rain
d. Snow
e. Don't remember

10. The object appeared: *(Circle One)*:

a. Solid
b. Transparent
c. Vapor
d. As a light
e. Don't remember

11. If it appeared as a light, was it brighter than the brightest stars? *(Circle One)*:

a. Brighter
b. Dimmer
c. About the same
d. Don't know

11.1 Compare brightness to some common object:

12. The edges of the object were:

(Circle One):

a. Fuzzy or blurred
b. Like a bright star
c. Sharply outlined
d. Don't remember
e. Other

13. Did the object:

(Circle One for each question)

a. Appear to stand still at any time?	Yes	No	Don't know
b. Suddenly speed up and rush away at any time?	Yes	No	Don't know
c. Break up into parts or explode?	Yes	No	Don't know
d. Give off smoke?	Yes	No	Don't know
e. Change brightness?	Yes	No	Don't know
f. Change shape?	Yes	No	Don't know
g. Flash or flicker?	Yes	No	Don't know
h. Disappear and reappear?	Yes	No	Don't know

64

Official U.S. Air Force UFO form

14. Did the object disappear while you were watching it? If so, how?

WENT UP OUT OF SIGHT (didn't have to go far because it was so cloudy)

15. Did the object move behind something at any time, particularly a cloud?

(Circle One): (Yes) No Don't know. IF you answered YES, then tell what it moved behind: the object climbed rapidly into the clouds, out of sight.

16. Did the object move in front of something at any time, particularly a cloud?

(Circle One): (Yes) No Don't know. IF you answered YES, then tell what in front of: the object climbed rapidly into the clouds, out of sight.

17. Tell in a few words the following things about the object:

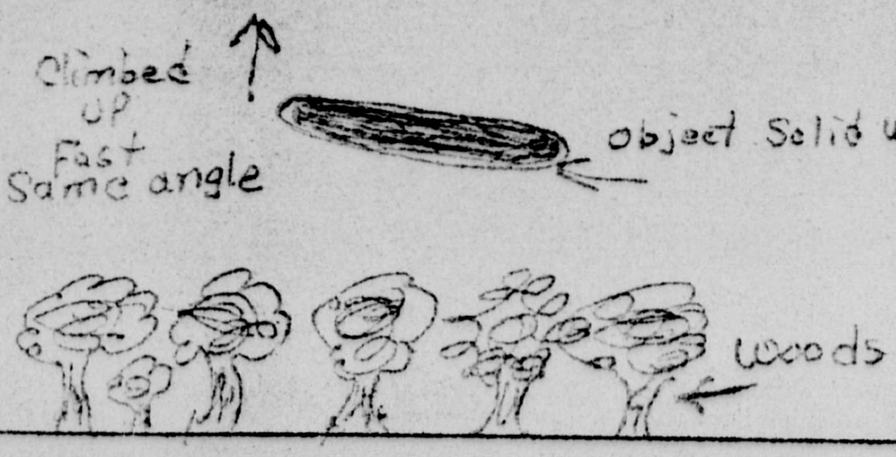
a. Sound No sound at all, except the dog barked at it.

b. Color White

18. We wish to know the angular size. Hold a match stick at arm's length in line with a known object and note how much of the object is covered by the head of the match. If you had performed this experiment at the time of the sighting, how much of the object would have been covered by the match head?

object was low and very little because the so big

19. Draw a picture that will show the shape of the object or objects. Label and include in your sketch any details of the object that you saw such as wings, protrusions, etc., and especially exhaust trails or vapor trails. Place an arrow beside the drawing to show the direction the object was moving.



20. Do you think you can
(Circle One
IF you answered YE

21. Do you think you ca
(Circle On
IF you answered YE

22. Where were you loc
(Circle One):
a. Inside a building
b. In a car
(c) Outdoors
d. In an airplane (t
e. At sea
f. Other

24. IF you were MOVI
24.1 What directio
a. North
b. Northeas
24.2 How fast wer
24.3 Did you stop
(Circle O

25. Did you observe th
a. Eyeglasses
b. Sun glasses
c. Windshield
d. Window glas

26. In order that you
jects which, when
hot-dog
shape.

Air Force UFO form continued

20. Do you think you can estimate the speed of the object?

(Circle One) Yes (No)

IF you answered YES, then what speed would you estimate?_____

21. Do you think you can estimate how far away from you the object was?

(Circle One) (Yes) No

IF you answered YES, then how far away would you say it was? 300 yds.

22. Where were you located when you saw the object?
(Circle One):

a. Inside a building
b. In a car
(c.) Outdoors
d. In an airplane (type)
e. At sea
f. Other_____

23. Were you (Circle One)

a. In the business section of a city?
(b.) In the residential section of a city?
c. In open countryside?
d. Near an airfield?
e. Flying over a city?
f. Flying over open country?
g. Other_____

24. IF you were MOVING IN AN AUTOMOBILE or other vehicle at the time, then complete the following questions:

24.1 What direction were you moving? (Circle One)

a. North c. East e. South g. West
b. Northeast d. Southeast f. Southwest h. Northwest

24.2 How fast were you moving?_____miles per hour.

24.3 Did you stop at any time while you were looking at the object?

(Circle One) Yes No

25. Did you observe the object through any of the following?

a. Eyeglasses	Yes	(No)	e. Binoculars	Yes	(No)
b. Sunglasses	Yes	(No)	f. Telescope	Yes	(No)
c. Windshield	Yes	(No)	g. Theodolite	Yes	(No)
d. Window glass	Yes	(No)	h. Other_____		

26. In order that you can give as clear a picture as possible of what you saw, describe in your own words a common object or objects which, when placed up in the sky, would give the same appearance as the object which you saw. a large hot-dog, cigar, banana, anything with that shape.

...far because ...dy)

...tell what ...to the

...tell what ...to the ...at it.

...note how much of the ...sighting, how much of ...ear the

...any details of the object ...row beside the drawing

Official U.S. Air Force UFO form c

34. Date you completed this questionnaire: MON 20 (Day) February (Month) 1967 (Year)

35. Information which you feel pertinent and which is not adequately covered in the specific points of the questionnaire or a narrative explanation of your sighting.

I have had a good education and I am mentally stable, I hope! I have discussed U.F.Os with many people and after my sighting I am a firm believer in them. I was not before the sighting. I have seen some pictures in the paper which resembles the UFO I saw. I think I should mention I live near the swamps, but I know it was not swamp gas as some people have told me.

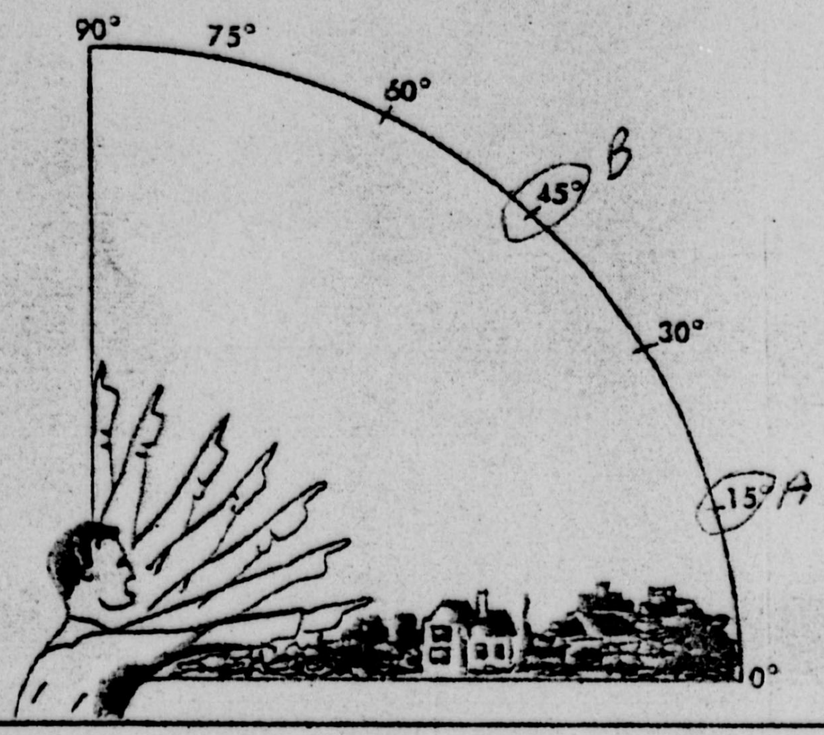
If I could be of any assistance in explaining this further with anyone, I would be pleased to do so.

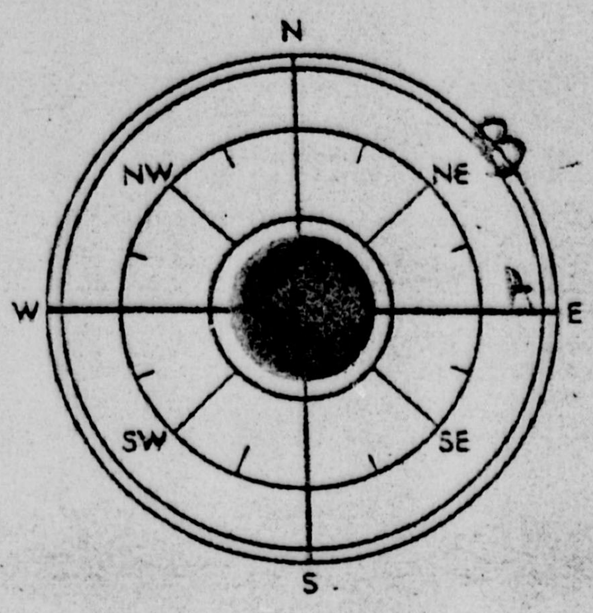
Sincerly Yours,

[redacted]

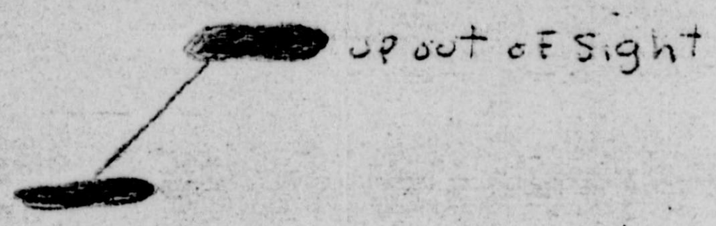
Official U.S. Air Force UFO form

27. In the following sketch, imagine that you are at the point shown. Place an "A" on the curved line to show how high the object was above the horizon (skyline) when you *first* saw it. Place a "B" on the same curved line to show how high the object was above the horizon (skyline) when you *last* saw it. Place an "A" on the compass when you *first* saw it. Place a "B" on the compass when you *last* saw the object.





28. Draw a picture that will show the motion that the object or objects made. Place an "A" at the beginning of the path, a "B" at the end of the path, and show any changes in direction during the course.



29. IF there was MORE THAN ONE object, then how many were there?_____
Draw a picture of how they were arranged, and put an arrow to show the direction that they were traveling.

30. Have you ever seen this,

no

31. Was anyone else with y

31.1 IF you answered Y

31.2 Please list their na

32. Please give the followin

NAME [redacted]

ADDRESS [redacted]

TELEPHONE NUMBER

Indicate any additional

at the
13 years old
yesterday

33. When and to whom did

?

Day

rce UFO form continued

30. Have you ever seen this, or a similar object before. If so give date or dates and location.

no

31. Was anyone else with you at the time you saw the object? (Circle One) Yes (No only My Dog)

31.1 IF you answered YES, did they see the object too? (Circle One) (Yes) No He barked continuously

31.2 Please list their names and addresses:

32. Please give the following information about yourself:

NAME [redacted] (Last Name) [redacted] (First Name) [redacted] (Middle Name)

ADDRESS [redacted] (Street) LINWOOD (City) 08221 (Zone) New Jersey (State)

TELEPHONE NUMBER [redacted] AGE 17 SEX Male

Indicate any additional information about yourself, including any special experience, which might be pertinent.

at the time of the sighting I was around 13 years old but I remember it as if it were yesterday.

33. When and to whom did you report that you had seen the object?

7 (Day) November (Month) 1963 (Year)

my parents and some friends, who said I was crazy.

Reports

Low-Latitude Noctilucent Cloud of 2 November 1963

Abstract. *Measurement of the filamentary noctilucent cloud of 2 November 1963 yields a height of 56 km. Study of the motion and orientation of the cloud confirms the hypothesis that these unusual clouds appearing in the southwestern states are produced by the launching of rocket vehicles from the Pacific Missile Range.*

On 15 June 1963 a noctilucent cloud was observed (*1*) which had a height of 71 km and an orientation and drift vector that indicated an origin from the Pacific Missile Range. Proper instrumentation was available to permit a more accurate measurement of the cloud that appeared on 2 November 1963. At the time the equipment was being used to study the height of the volcanic dust from Agung (*2*) as illuminated by the set sun. After the primary glow stratum was occulted by the earth's shadow, the darkening sky showed a white filamentary cloud in the direction, WNW. It was immediately apparent that a noctilucent cloud was becoming visible, and its white color indicated that it was not simply a low-lying cloud illuminated by the glow stratum.

Three 35-mm photographs of 6- to 30-sec duration at *f*/3.5 were obtained on Kodachrome film. The time that the sun set on the cloud was recorded for four points on the cloud. Subsequent measurement of the points along the cloud yielded heights, range, and velocity for the cloud. The locations of the cloud in space are shown in Figs. 1 and 2. The velocity, vector, and orientation, shown in Fig. 1, again places the east end of the cloud close to the Pacific Missile Range at 2:15 P.M. PST, indicating that a missile was probably launched toward the south-Pacific impact area. No data confirming the launching of a ballistic missile is on hand; however, the evidence seems quite conclusive.

While the measurement of noctilucent clouds from 28-mm focal length 35-mm films is subject to rather appreciable errors, the independent measures of velocity from different portions of the cloud agree within 5 per cent. The scatter in observed points in Figs. 1 and 2 indicate that the orientation of the cloud in space is linear and inclined upward toward the southwest. The altitudes shown in Fig. 2 have been corrected for −3.7 km refraction of sunlight past the tangent point of the solar rays. Since the observed time of sunset was used to keep time measurements on a homogeneous basis, the second refraction term is eliminated. A screening height of +1.8 km is assumed, based upon earlier experience (*2*), yielding a net correction to the geometrical heights of −1.9 km. The mean height of the cloud is 56 km, distinctly lower than the 71 km observed for a similar cloud (*1*).

The observations on the cloud (*1*) of 15 June supplied insufficient data to detect whether the cloud lay at a constant level. In the case of the cloud of 2 November we can definitely state that the cloud was inclined in space. As a consequence we must be cautious in interpreting the azimuthal orientation since wind shear over 10 km of altitude can appreciably modify the original cloud in the 3 hours required for the cloud to arrive in the vicinity of Yuma. The appearance of the cloud, consisting of two closely parallel streaks, does not indicate appreciable nonlinear shear since both are only mildly contorted in identical manner with the intervening region filled with less conspicuous cloud. Several points of sun-illuminated cloud were observed near the horizon below the eastern end of the cloud, indicated by the dotted line in Fig. 1. The height and range of these fragments could not be determined.

The coincidence of the clouds of 15 June and 2 November 1963 with a drift vector indicating origin from the Pacific Missile Range would appear to remove the probability of a fortuitous occurrence that could have been argued from one cloud alone. The height of 56 km removes this cloud from any connection with the Agung volcanic dust layer (20 km) (*2*) or with the 80-km region associated with the occurrence of natural high-latitude noctilucent clouds (*3*). Newkirk (*4*) has recently reported a nacreous cloud observed after the set of the volcanic glow stratum on 25 September 1963 for which he derives a height of 33 km. The filamentary structure of his cloud is quite similar to that observed by us on 2 November, but the altitude is definitely lower and the cloud is probably of different origin.

ADEN B. MEINEL
CAROLYN P. MEINEL
Steward Observatory, University of Arizona, Tucson

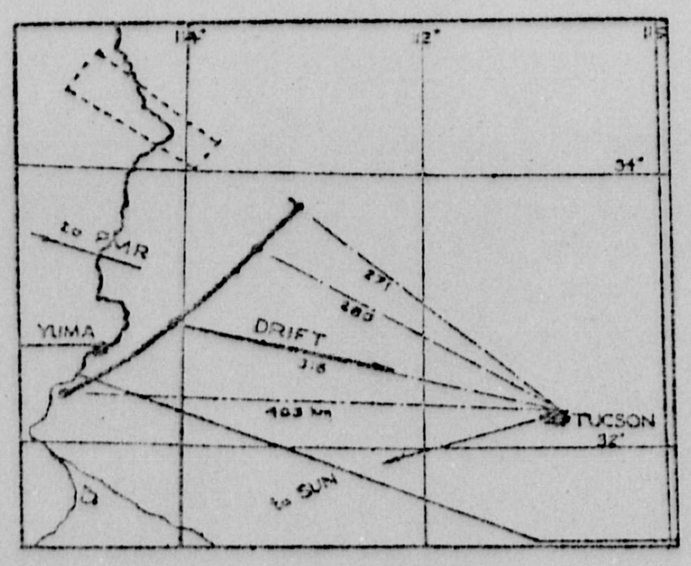


Fig. 1. The observed range and orientation of the noctilucent cloud of 2 November is shown with respect to Tucson and the direction of the Pacific Missile Range.

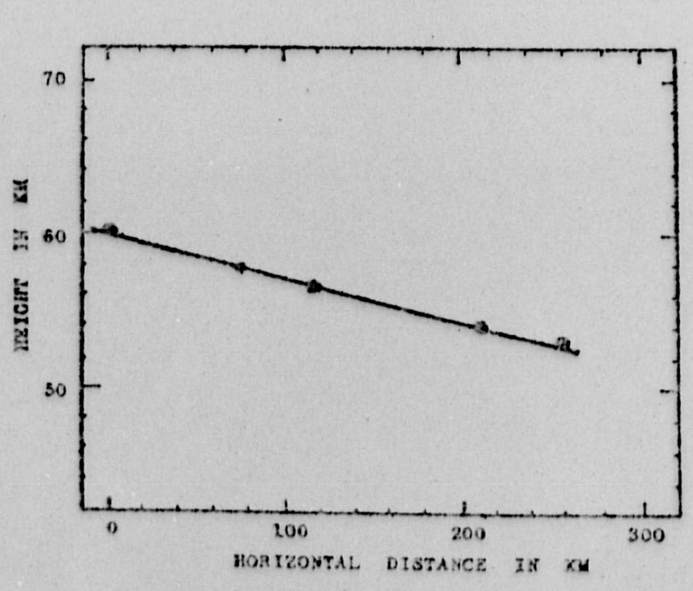


Fig. 2. The heights computed for the cloud at points along its length indicate that the cloud is linear and inclined upward toward the southwest end.

are markedly different from those of the people whose societies and governments constitute the national states of this troubled corner of the world. The Chin of the hill regions in western Burma are such people. In some ways the Chin are primitive and tribal in culture and society, but in other ways they resemble the peasantries of emerging industrial nations in other parts of the world. Lehman calls Chin society and culture "subnuclear" because it adjoins with and is heavily dependent upon the Burman civilization of the plains, yet the Chin maintain their distinctive cultural tradition, which is marginal to Burman civilization, and do not actively participate in the political affairs of the Burman state. In this monograph the author attempts to delineate precisely and in detail the distinctive ways in which the Chin relate to Burman culture and society.

The author's approach is ecological, but ecological in two senses of the word. There is the relation of various Chin groups to the resources of their territories. Historically, differences in resources as well as different adaptations to and exploitations of resources have produced notable differences among Chin groups. These differences among Chin societies have also resulted in different social ecologies—that is, relationships to Burman civilization upon which all Chin are firmly dependent. In this analytic framework, differences between northern and southern divisions of the Chin peoples with respect to land use and tenure, social structure, economics, religion, and ethos as well as differential responses to contemporary stimuli are described and compared.

Despite its brevity the monograph covers a great deal of material, clearly and concisely. It is written for anthropologists who are already familiar with the basic writings on the Chin and related peoples and with current theoretical trends (and controversies) in British and French social anthropology. It is, therefore, more technical than general. Its ecological emphasis, which is derived from the Studies of Cultural Regularities (a project at the University of Illinois), is well suited (and well applied) to the difficult task of describing differences among the Chin as well as their differing social, cultural, and economic relationships to Burma and the Burmese.

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Physical Chemistry

Ion Association. C. W. Davies. Butterworth, Washington, D.C., 1962. viii + 190 pp. Illus. $7.50.

C. W. Davies, in the more than 30 years that he has devoted to the study of electrolytes in solution, has emphasized interpretations that involve ion association.

This brief book is a worthwhile summary of the field *from the point of view that accepts ion association as the principal explanation for diverse anomalous properties of electrolyte solutions*. The author admits several times that this approach may be open to question, but the point is not adequately discussed, and this is the book's main fault. Certainly the point of view adopted is very different from that expressed by T. F. Young—for example, see his articles in volumes 3 and 13 of *Annual Review of Physical Chemistry*.

An impression of the scope of this book may be gained from the chapter titles: "Introduction," "Conductivity methods," "Activity measurements," "Spectrophotometric methods," "Electrometric methods," "Other methods," "Review of results in water," "Results in mixed solvents," "Non-aqueous solutions," "The dissociation minimum," "Colloidal solutions," "Thermodynamic properties of the ion-pair," "Kinetics and mechanisms of reactions involving ions and ion-pairs," and "Theories of ion association." An appendix gives dissociation constants for more than 400 ion-pairs, but whether such a value as

$$[Cs^+]\,[Cl^-]\,f_\pm^{\,2}/[CsCl]\,f_u = 2.5,$$

one of the tabulated values, is a chemically meaningful quantity is open to question.

The equation for the mean ionic activity coefficient of an electrolyte,

$$-\log f_\pm = 0.50\ Z_1 Z_2 \left(\frac{I^{1/2}}{1 + I^{1/2}} - 0.20\ I\right),$$

which was proposed by Davies in 1938, has been widely used. The author now modifies this equation by substituting 0.30 for 0.20 as the coefficient of ionic strength in the linear term, a modification that he bases on the consideration of a larger number of electrolytes.

Approximately one-quarter of the literature references are to papers published in 1957 or later, but only a few refer to papers published in 1960 and 1961. There are important omissions, among them several that would give the presentation a more critical flavor: Redlich's discussion of criteria for association of ions to form molecules [*Chem. Revs.* **39**, 333 (1946)], Mayer's theory of ionic solutions [*J. Chem. Phys.* **18**, 1426 (1950)], and the discussion by Frank and Thompson of the limitations of the Debye-Hückel theory [*J. Chem. Phys.* **31**, 1086 (1959)].

The lack of a more completely balanced picture of this important area of physical chemistry mars the usefulness of this book.

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Notes

Ornithology

Birds of Hampshire and the Isle of Wight (Oliver and Boyd, Edinburgh, 1963. 290 pp. 30s.), a local "ornithology" by Edwin Cohen, covers an area in England whose bird life was first extensively reported in a book (by Kelsall and Munn) published in 1905. The present volume brings together the data recorded by many observers since 1905 and carefully compares the present conditions and the current status of the included avian species with the reports published in the earlier work.

Although the main body of the text is in the form of a detailed annotated catalog, the book differs from many regional works in that it includes nine introductory chapters, written by several authors.

D. W. Wray writes on the geology of the area and A. K. Hunt on the botany. D. F. Billett contributes a chapter entitled "Survey of the southeast corner of the County." E. L. Jones discusses birds and land-use in northwest Hampshire, and J. S. Ash, the distribution of birds in relation to habitat in the Fordingbridge area. Several chapters on the birds of special parts of the region were contributed by J. H. Taverner, J. Stafford, and the main author, Cohen. The book is thus of wider usefulness than are most purely regional catalogs, although it is to be expected that its main body of readers will be local.

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CALIFORNIA BOLIDE OF 1963 NOVEMBER 7/8

A.M.S. No. 2379 Calif Area

On this date at 6:11 p.m. P.S.T., a bright bolide appeared over California, going in general from east to west and crossing the San Francisco area. Requests for information were published by Dr. Lemar and Miss Romig, of the Rand Corporation, in Santa Monica, in San Francisco papers and those of surrounding regions. The 60 reports secured by them were turned over J. P. Bagby, A.M.S. Regional Director for Central California, and by him sent on to me for solution. Many observers, besides their original letters, filled out questionnaires. When the reports were first examined it seemed that an excellent solution would be easy to obtain. Further study soon changed this opinion. First because most reports came from people in a small area, secondly because for so many the body passed almost through their zeniths. This made the azimuth of the projected path easy to determine. Also the sub-end point could be found quite accurately. But it has the opposite effect on the sub-beginning point as in nearly vertical paths the observed azimuth for beginning point becomes indeterminate in many cases, so we have few usable azimuths for this from observers well to the side.

Two observers at Lick Observatory, Mt. Hamilton, Calif., S16, A. N. Thomas and Mrs. Jean McIntyre saw the bolide. Unfortunately their reports are exact duplicates. They were on an upsloping hillside which prevented them from seeing the actual end. They gave a vertical path, a = 100°, h1 = 60°, h2 = 30°; this is considered the key to the solution. That at S2 was made by Capt. A. C. Aitken Jr., San Francisco Bay Pilot, when at λ 122°35'.0 and Ø 37°46'.9. He did not see the beginning as the bolide came from behind but for the end point his observation a2 = 70° and h2 = 25° is considered the key. Only two reports seem of definite use in fixing a point on the path, and hence its slope, as obviously those almost under it could not give azimuth lines of real value for intermediate points. J. G. Enas, Berkeley, S26, gave diagrams showing the slope and the two observed altitudes. H. L. Laue, Berkeley S27, gave an excellent diagram showing the slope, also the azimuths and altitudes of three points. Assuming that h1 for S26 refers to the same azimuth as h1 for S27, i.e. a = 25°, we derive a point on the path at h = 85 km. As H2 = 30 km we find a slope of 38° and that the observation at S16 would have H = 99 km which we take as the actual beginning height H1. Besides reasons stated, the beginning azimuths for many observers were useless as they were in cars where altitudes are usually limited to about 28°. Fortunately many of these could see clearly the end of the path and their reports could be used for that. Isolated clouds hampered some observers. Nobody used stars, which were named, as reference points.

The bolide was very spectacular, it certainly showed an apparent disk. A conservative average would be a diameter of 10'±. It was so brilliant that it was seen by D. Morris, S61, at a station 542 km to the southeast, when 2° above the local horizon. Even at that distance it was brighter than Jupiter. The color was white or blue white, by a large majority of reports. The estimates of duration are complicated by many seeing but part of the path. They range from 1- to 10-15 seconds. That at S16, 1-2 sec. refers to 30° of the path only. As this was only about 2/3 of the whole, the duration would be about 2.8 sec. For 11 observers not in cars the average was 4.45 sec. As usual, the duration is uncertain, probably 3 to 4 seconds is about right. No actual explosion came at end of path but many reported fragments or sparks falling from the end point. As its height was 30 km it is improbable that meteorites fell; if they did it would have been into the ocean.

To the persons previously mentioned, the press, and the numerous other observers

FLYING SAUCER REVIEW
Jan-Feb 66

14 Nov 63
Argentina

La Plata

According to the newspaper *La Razón* of Buenos Aires (November 14, 1963) many people at La Plata saw, between midnight and 1 a.m. of that day, a luminous cigar flying westwards towards the Andes and emitting a powerful light varying from blue to white or yellow.

FLYING SAUCER REVIEW
Jan-Feb 66

15 Nov 63
Argentina

Mar del Plata

According to a report published in the *Histonium Review* for November 15, 1963, hundreds of people in the coastal town of Mar del Plata had recently seen a 'cigar' stationary in the sky. This was just after midnight. The machine remained there from 12.30 a.m. to 12.45 a.m., when it suddenly began to move off and vanished rapidly towards the north.

NO CASE (INFORMATION ONLY)
SAUCER NEWS; VOL II, MAR 64

16 NOV 63
BUENOS AIRES

Another sighting, from the Buenos Aires newspaper "El Mundo," dated November 16th, translates in part as follows:

"Mar del Plata: Upon hearing the words 'flying saucer,' hundreds of residents of this city rushed to their balconies or the nearest open space, early yesterday morning, to see a cigar-shaped object which was giving out an intermittent light, which at times was white and at times bluish. This object hovered over the city for 15 minutes, from 12:30 to 12:45 a.m. It finally disappeared at high speed toward the north. The machine - for, due to the way it maneuvered, it could not have been a natural phenomenon - was over the western part of the city, about thirty degrees above the horizon. Among the witnesses was Horacio Tarifeno, chief of the information service of radio station LU9, who went out on his terrace after receiving many excited telephone calls about the object."

THE SALTWOOD MYSTERY

Strange happenings in Kent

THE evening of Saturday, November 16, 1963, was cold and bright and there was a new moon in the sky. Four teenagers, three boys and a girl, were walking along a country road in the area of Sandling Park, near Hythe, Kent. John Flaxton, aged 17, a painter employed in the Kent village of Saltwood happened to look at the sky above the woods at Slaybrook Corner and noticed that one of the stars above him appeared to be moving.

John Flaxton admitted to being frightened, for not only was the "star" moving: it was descending towards the four young people. Flaxton stated to a reporter: "It was uncanny. The reddish yellow light was coming out of the sky at an angle of sixty degrees. As it came towards the ground it seemed to hover more slowly. I grew cold all over as it vanished behind a clump of trees." The next thing to happen sent the four young people rushing for safety in terror. A bright golden light suddenly appeared in the field alongside them. "It was about eighty yards away," John Flaxton declared, "floating about ten feet above the ground. It seemed to move along with us, stopping when we stopped as if it was observing us. The light was oval, about fifteen to twenty feet across with a bright, solid core.

"It disappeared behind trees and a few seconds later a dark figure shambled out. It was all black, about the size of a human but without a head. It seemed to have wings like a bat on either side and came stumbling towards us We didn't wait to investigate."

Was it a ghost?

One of John's companions, 18-year-old Mervyn Hutchinson, a plastic moulder of Bartholomew Lane, Saltwood, also saw the figure clearly.

"It was just like a bat with webbed feet and no head."

All four teenagers were convinced they had seen a ghost.

"I've never been so frightened. I didn't believe in ghosts until then," says 16-year-old Jenny Holloway of Lenham.

From the preceding account it will be seen that the four witnesses assumed that what they had seen was supernatural. The story was given publicity in the local newspapers and in the national press, too. As the FLYING SAUCER REVIEW has pointed out from time to time, ghosts and miracles may be merely rationalisations for flying saucers which the majority will even now not accept as real. On the other hand, Hythe and Folkestone may well have been confronted with two or even more mysteries. But it would certainly seem that John Flaxton's experience appears to be well within the Type 1 sighting classification (see Jacques Vallée's article in the REVIEW'S January-February, 1964, issue).

Other experiences in the area are as follows: —

November 21, 1963. Witness: Keith Croucher.
Age: 17.
Occupation: Apprentice Electrical Engineer.

"I was passing the Brockhill School football pitch which leads on to the Sandling Estate when I felt a sudden breath of cold wind and saw what looked like a golden mist beginning to cross the pitch. At the centre of the mist was a solid oval light that seemed to move slowly over the ground. The whole thing was about twenty feet square. I was frightened and ran away. When I came back it had gone."

November 23/24. Witnesses: John McGoldrick and friend.
Age: 16.
Address: Hythe, Kent.

"After hearing about Keith Croucher's experience, I went with a friend into Sandlingwoods to investigate. In a clearing in the woods we found a vast expanse of bracken that had been completely flattened — as if some huge and heavy object had rested there. Nearby we found three giant footprints. They were clear footprints, almost two feet long and about nine inches across. They must have been a full inch deep. On December 11 we went down to the site with two reporters and found the wood lit up by a strange pulsating light. It seemed to come from the heart of the trees. We kept watch at a distance for over half an hour but saw nothing except the light. We were far too frightened to go any closer."

Mr. William Waite, a retired senior civil servant

who used to work for the Aeronautical Inspection Board, near Uxbridge, Middlesex, was walking with his dog in the neighbourhood about a week before the event described above made the following statement when interviewed: "I saw this bright bluish-white light, about the size of a golf ball flying directly ahead of me. It travelled quite slowly in a steady horizontal direction. It definitely wasn't an aeroplane. The whole thing struck me as very peculiar. The light appeared from the north, crossed Sandling Road, where all these strange things have been seen, and headed out for sea."

Sceptics then got busy with explanations which ranged from magnesium flares to poachers flashing torches to hypnotise the birds.

The local rector, the Rev. E. E. Stanton, when asked his opinion, replied: "It definitely isn't a hoax. Several youngsters have told me about the strange things they have seen. All were very frightened. Obviously they have seen something out of their normal experience."

Some adherents of the ghost theory recall the legend that Slaybrook Corner was the scene of a bloody battle centuries ago. Others declare that the ghost of William Tournay Tournay is the culprit. Tournay was an eccentric who was buried at his own request on an island in the middle of a lake on the estate.

FLYING SAUCER REVIEW
Jan-Feb 66

28 Nov 63
Argentina

Alta Gracia

The *Diario de Córdoba* for November 29 reported that at 10 p.m. on the previous evening two men named Gustavo Pipino and Carlos Perez had been driving along the road to Alta Gracia in the province of Cordoba when they came across a luminous blue object, circular, and about 30 metres in diameter, which was hovering at about 20 metres from the ground and at about 50 metres from the highway. While they were watching it, the object suddenly made off and vanished at staggering speed.

who took the time and effort to report, very many thanks and our appreciation are due.

The usual data for the atmospheric path and a parabolic orbit follow.

Date	1963 November 7.59
Sidereal time at end point	316°
Began over	λ 122°19′, Ø 37°25′ at 98 km
Ended over	λ 123°17′, Ø 37°34′ at 30 km
Projected length of path	88 km
Length of path	112 km
Duration	3.5 sec (very uncertain)
Observed velocity	32 km/sec (very uncertain)
Radiant uncorrected	a = 280°; h = 37°54′
Curvature correction	−24′
Parabolic zenith correction	−4°37′
Radiant corrected	a = 280°; h = 32°.9
Radiant corrected	α = 14°, δ = +12°
	λ = 18°, β = +6°

Parabolic orbit: i = 3°, Ω = 225°, π = 1°, q = 0.85 A.U.

In Hoffmeister-von Niessl Catalogue we find:

No. 430, 1908 Nov. 7, α = 15°; δ = +9°

No. 447, 1869 Nov. 13, α = 12°; δ = + +14°

Both have radiants similar to the above.

1 - 31 DECEMBER 1963 SIGHTINGS

DATE	LOCATION	OBSERVER	EVALUATION
Dec	Dixon, Illinois	[redacted]	Other (PSYCHOLOGICAL)
2	11 30N 97.10E (Indian Ocean)	[redacted]	Other (SATELLITE DECAY)
2	Caralles Islands, Pacific	Military	Other (MISSILE)
5	Congers, New York	[redacted]	Other (UNRELIABLE REPORT)
6	Ashland, Kentucky	[redacted]	AIRCRAFT
6-7	France	Military (RADAR & PHYSICAL SPECIMEN)	Other (RADAR REFLECTOR)
7	Pennsylvania	[redacted]	Astro (METEOR)
8	Annandale, Virginia	[redacted]	Astro (METEOR)
9	40.20N 17.40W (Atlantic)	Military	INSUFFICIENT DATA
10	White Plains, New York	[redacted]	Other (FLARE)
11	McMinnville, Oregon	[redacted]	UNIDENTIFIED
11	Snowmass, Colorado	[redacted]	BALLOON
11-12	Washington, D. C.	Military	Other (BIRDS)
13	Cinnaminson, New Jersey	[redacted]	Astro(METEOR)
14	San Jose, California	[redacted]	Astro (METEOR)
14	38.30N 175.20W (Pacific)	Military	SATELLITE
15	Kettering, Ohio	[redacted]	Astro (METEOR)
16	40.00N 175.54W (Pacific)	Military	UNIDENTIFIED
16	33.30N 174.40W (Pacific)	Military	SATELLITE
19	25.50N 149.49W (Pacific)	Military	INSUFFICIENT DATA
21	31.20N 170W (Pacific)	Military (RADAR)	AIRCRAFT
21	Clovis, New Mexico	[redacted]	Astro (METEOR)
26	Dayton, Ohio	[redacted]	SATELLITE

ADDITIONAL REPORTED SIGHTINGS (NOT CASES)

DATE	LOCATION	SOURCE	EVALUATION
Dec	Argentina	News Clipping	
2	Grand Rapids, Michigan	" "	
10	Tacoma, Washington	" "	
12	Conningsby RAF Station	" "	
12	Agua Prieta, Mexico	" "	
13-14	King City, Calif.	" "	
17	Argentina	" "	
25	"	" "	
28	Ngongotaha, New Zealand	" "	

[redacted]
Dept 200

DIXON
AUG 23
AM
1965
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United States air force
Washington D. C.

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