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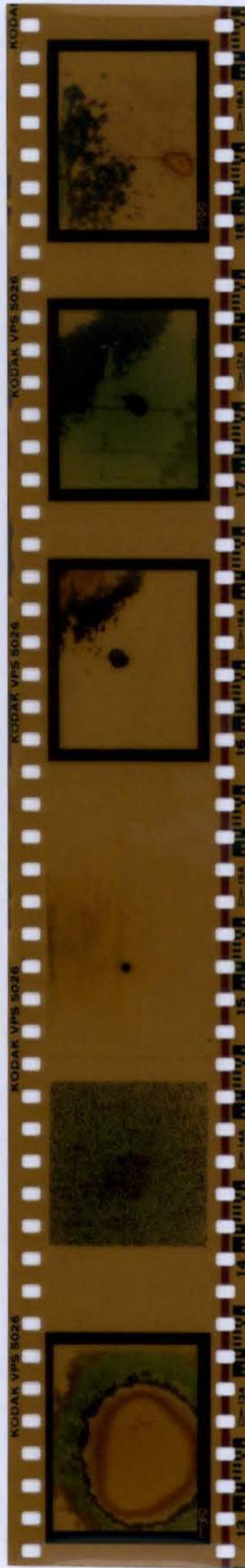
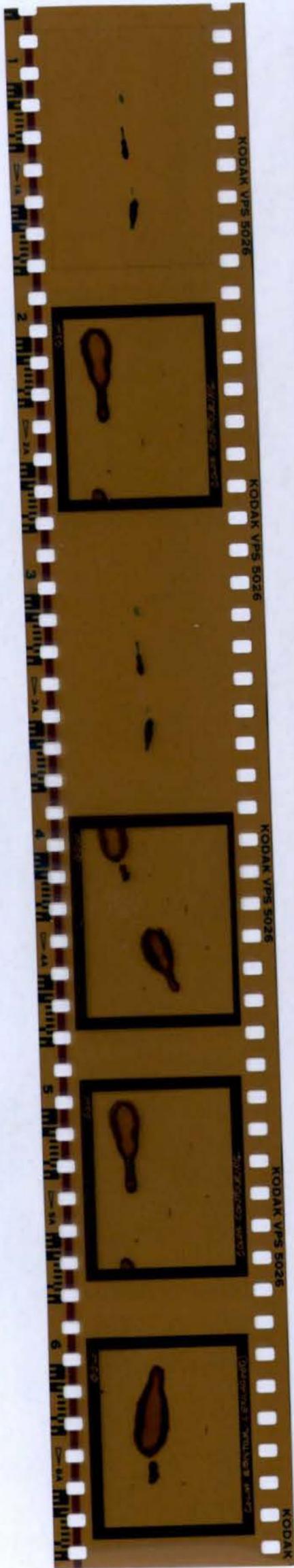
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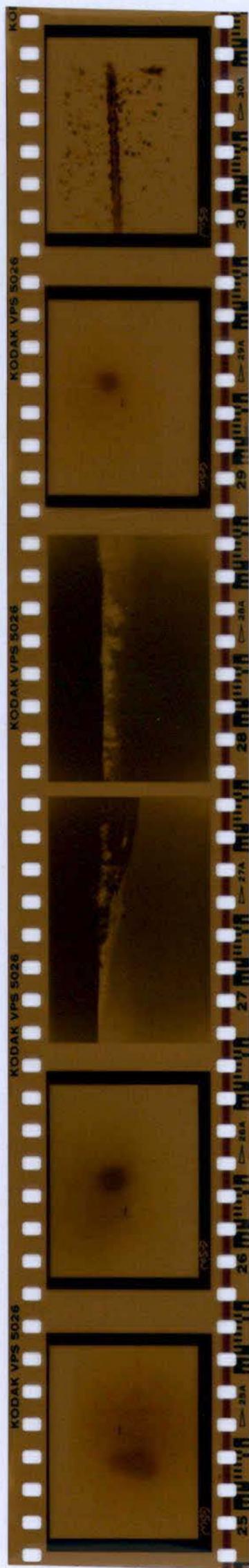
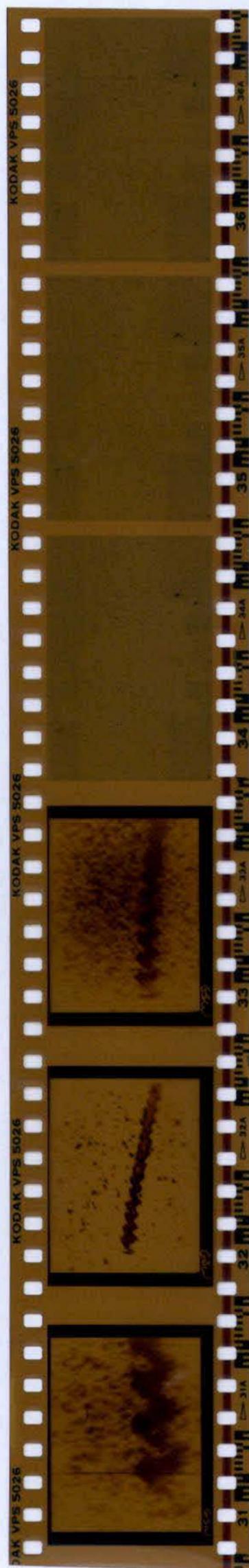


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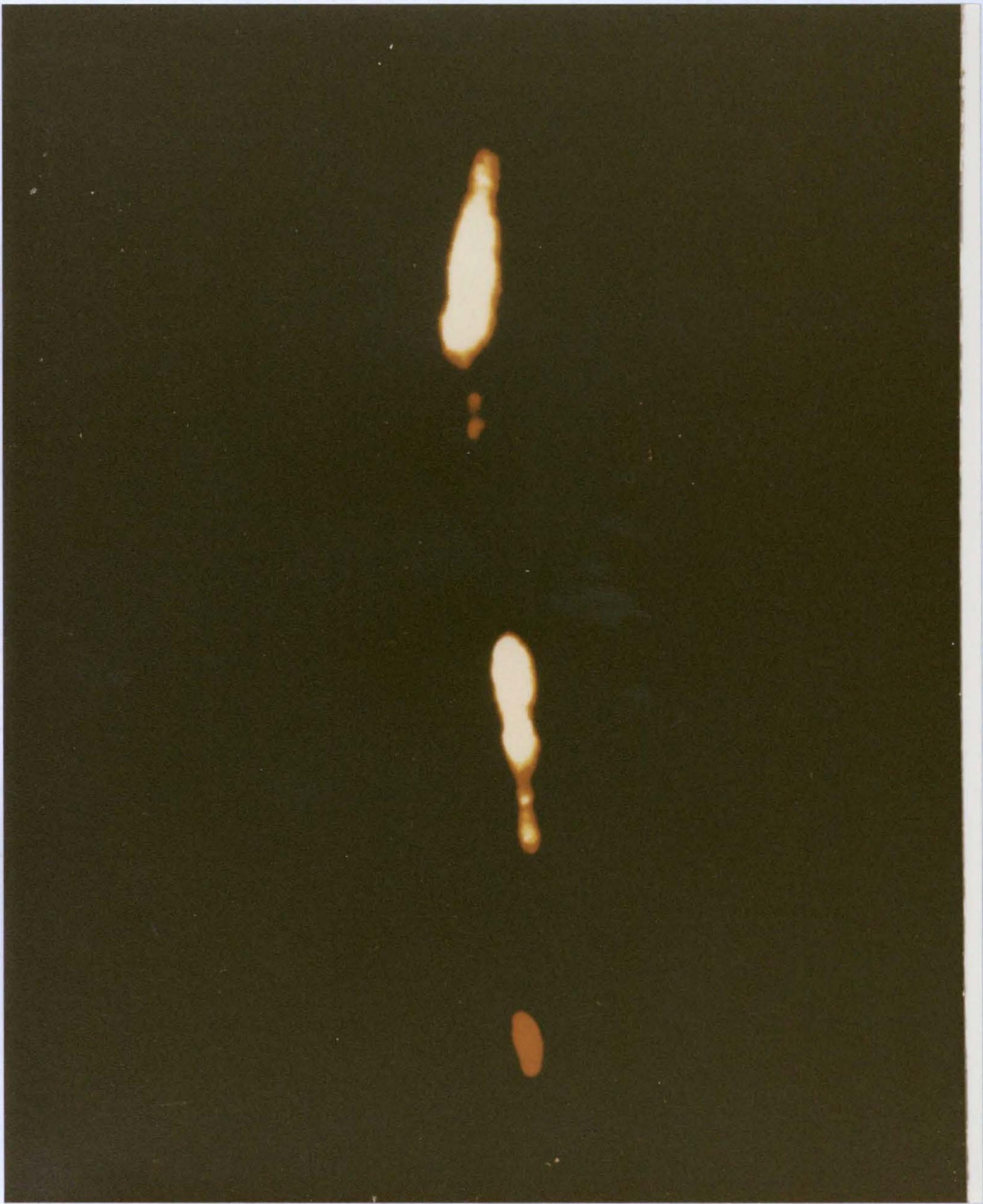
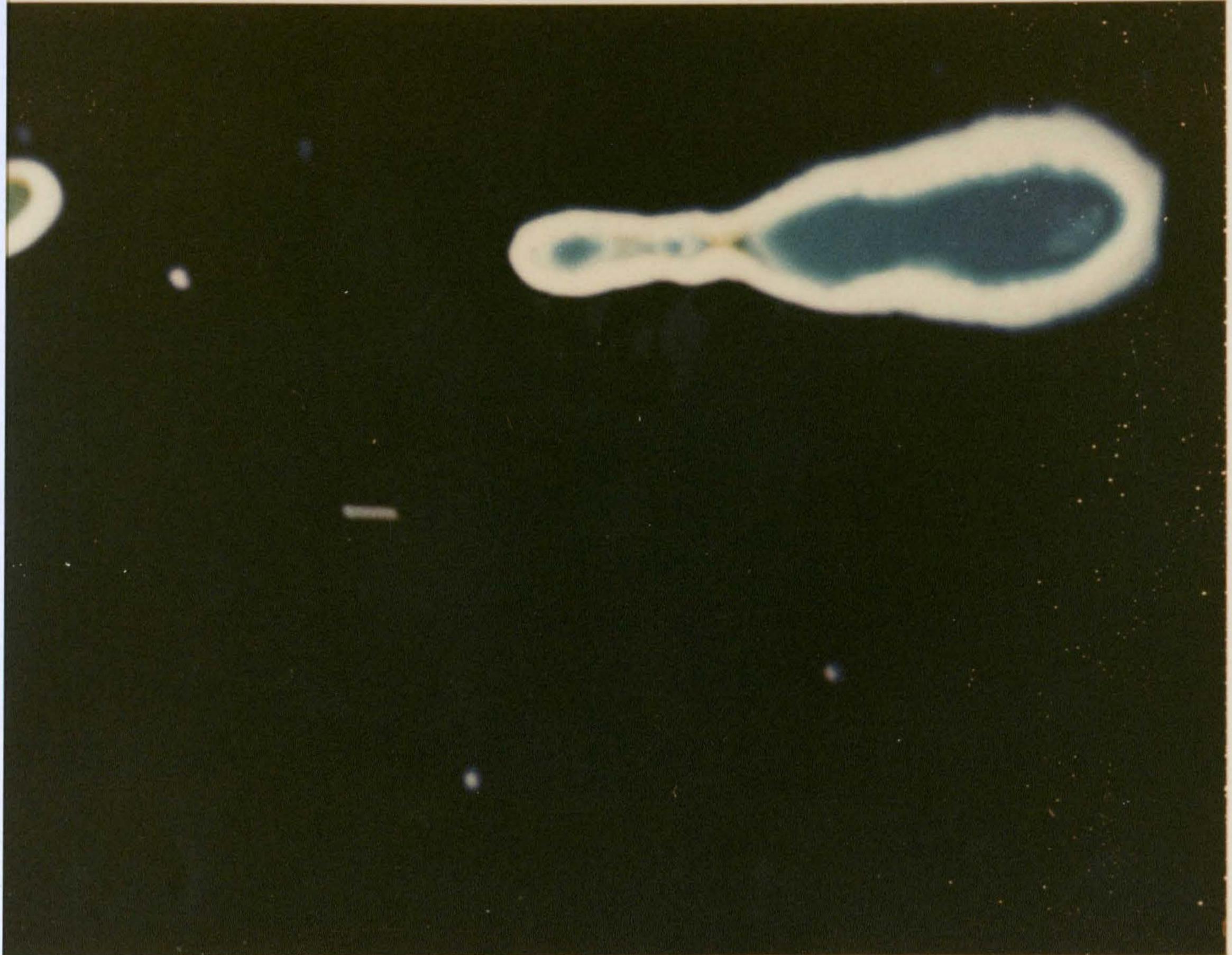


FIG A7 P66 GSW Nol.

G5W



G5W

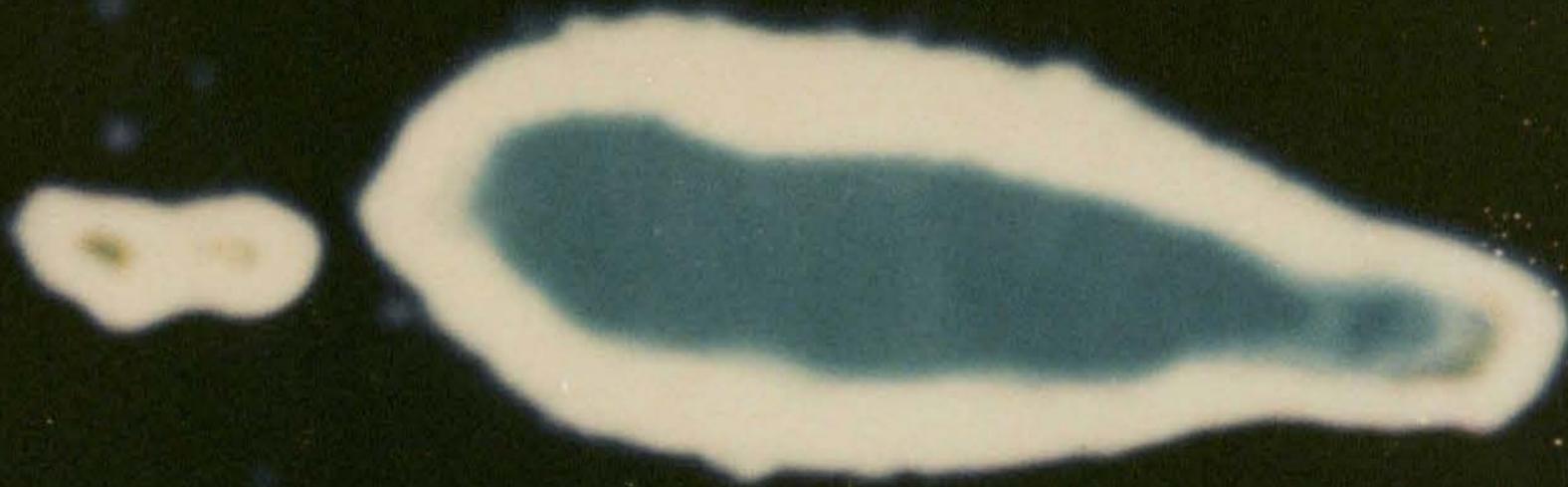
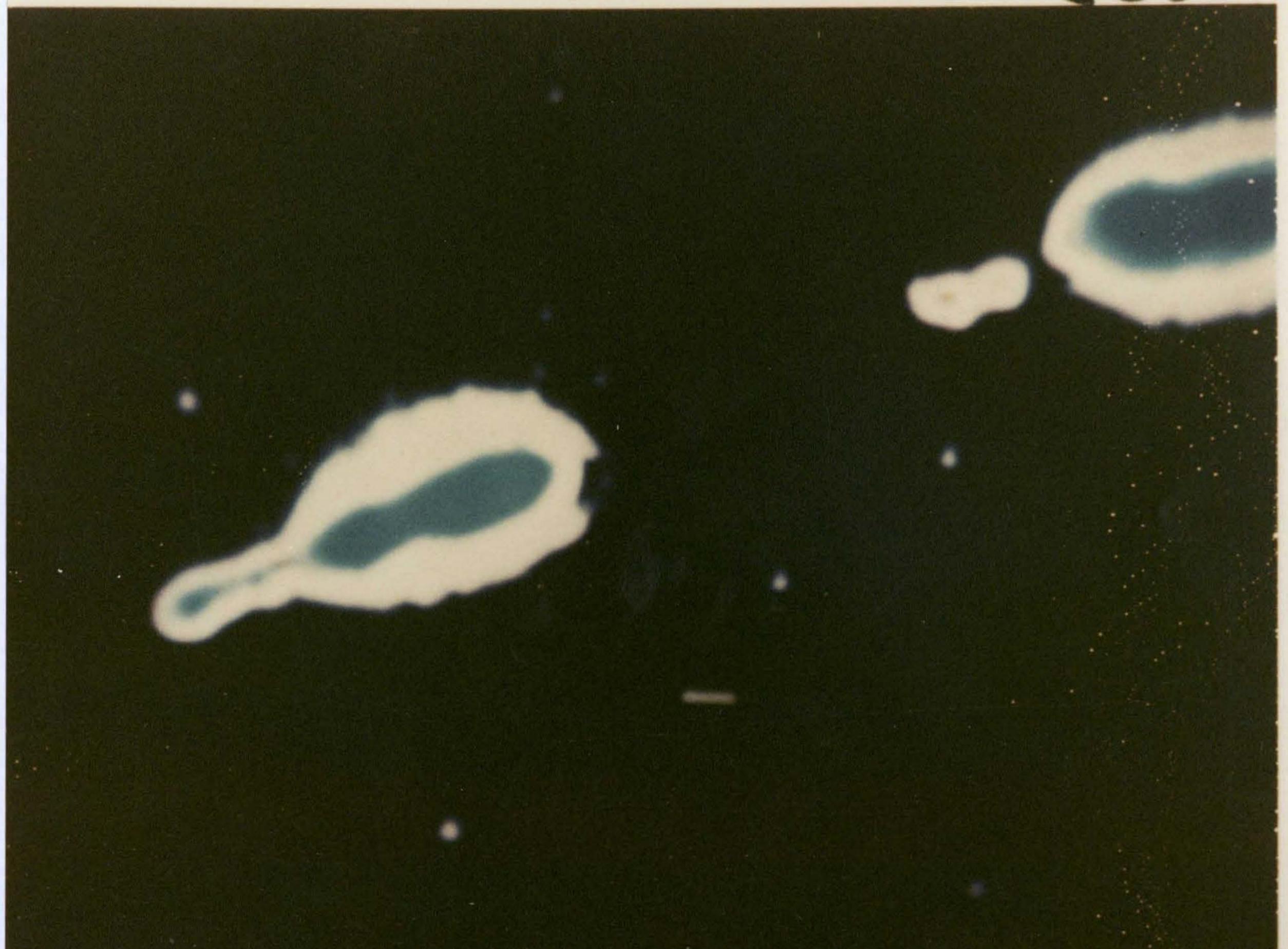
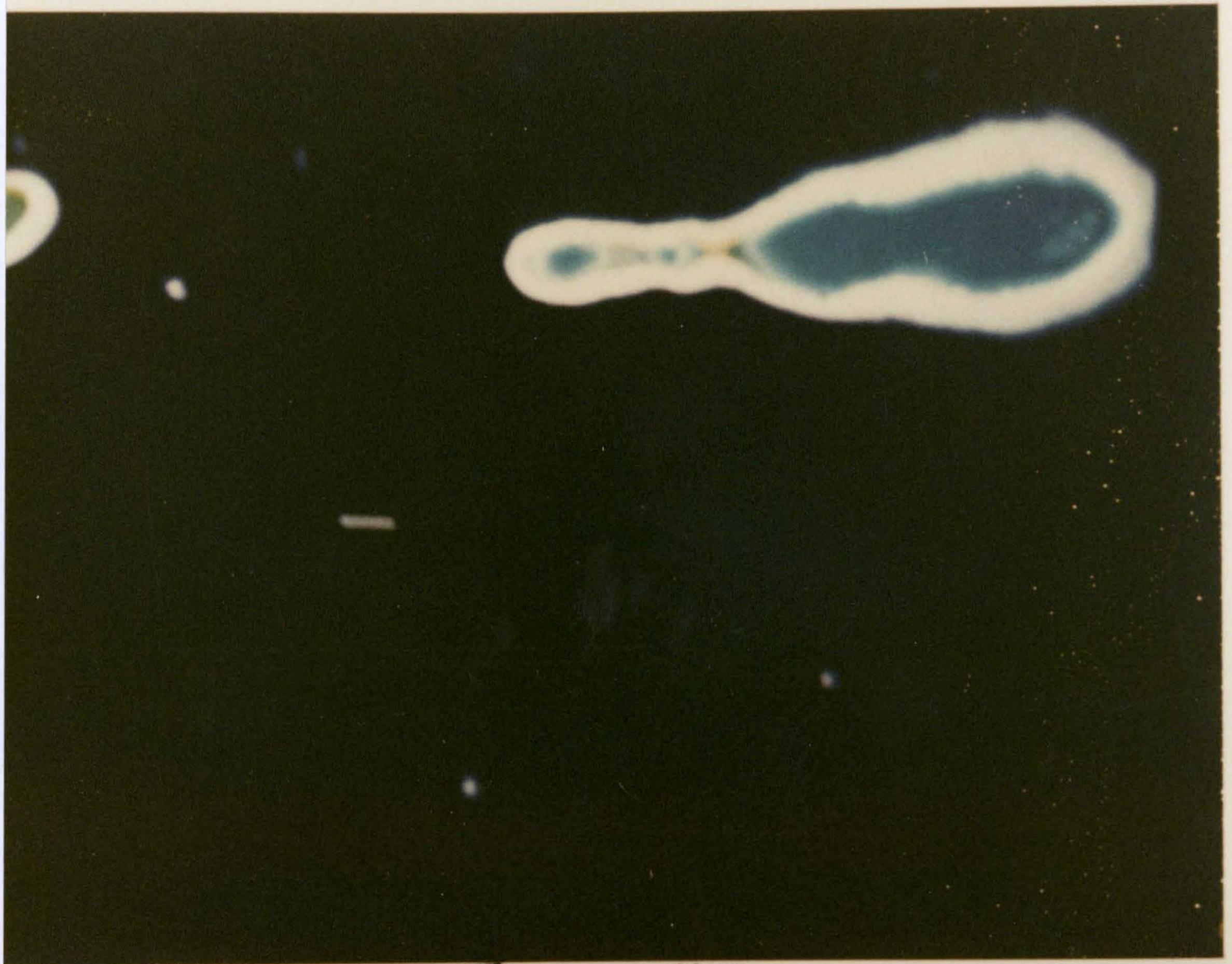


FIG A7 P66 GSW No1.

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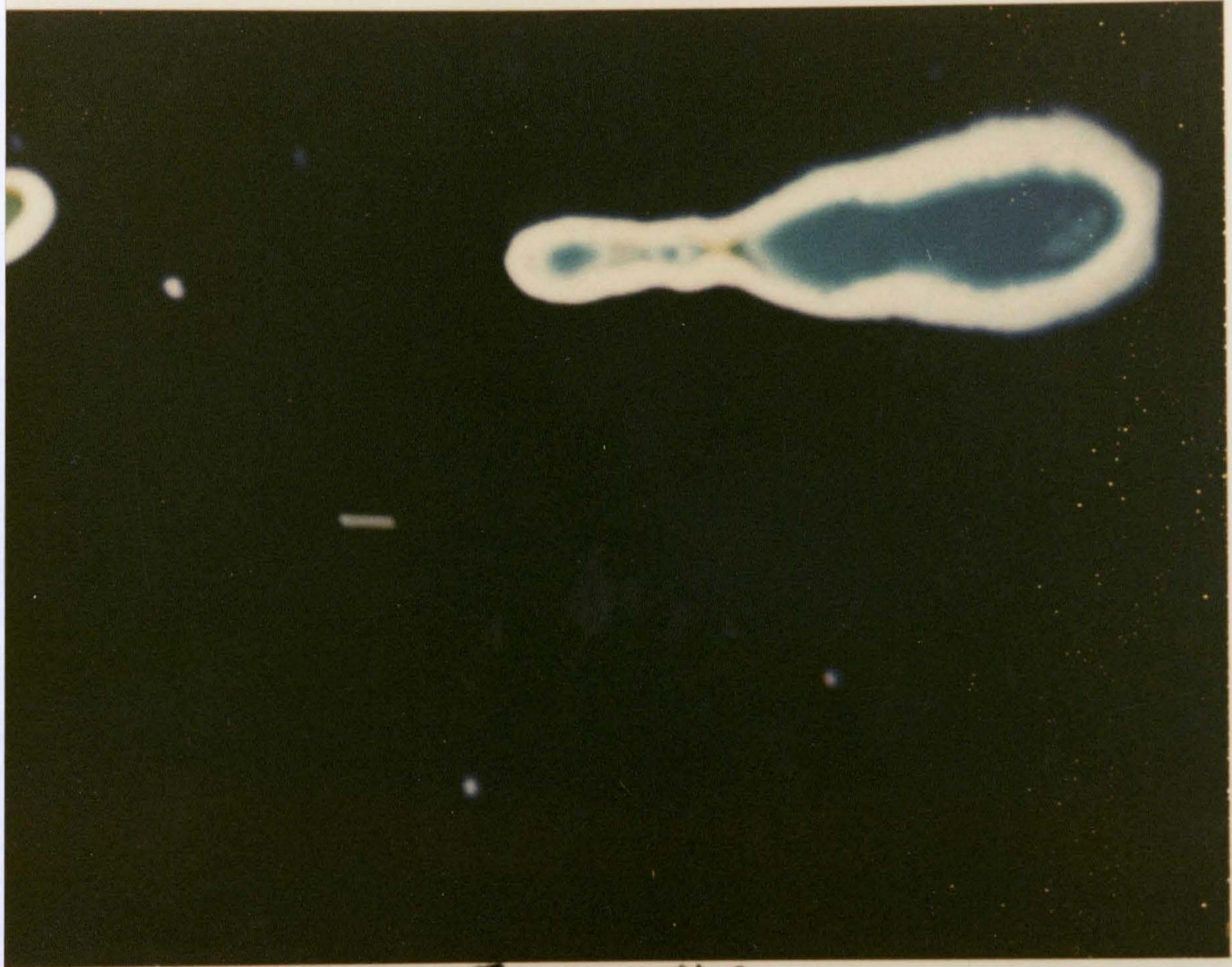
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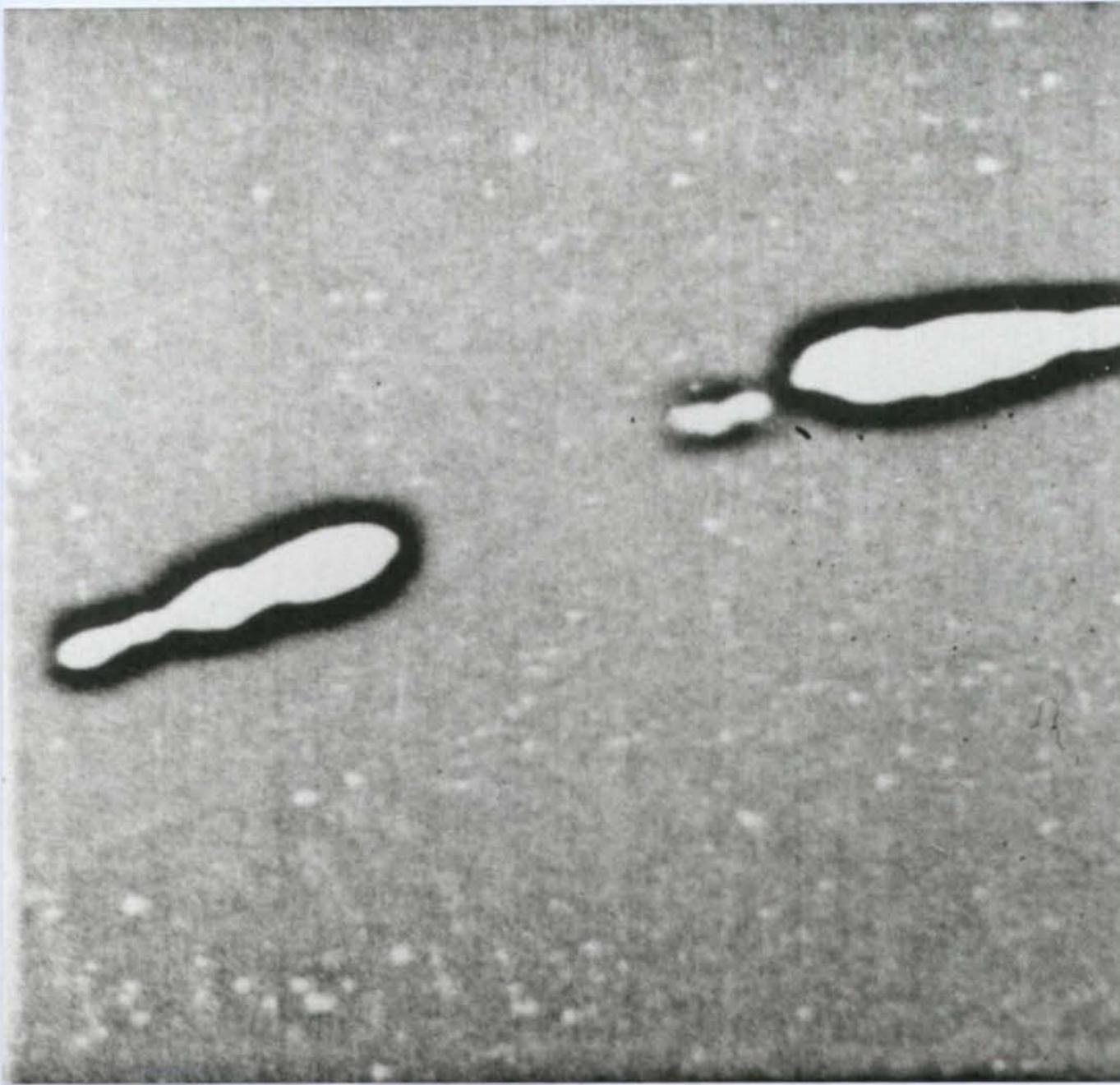
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ANALOG CONSTOURLING

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FIG A7 P66 BSW No 1.



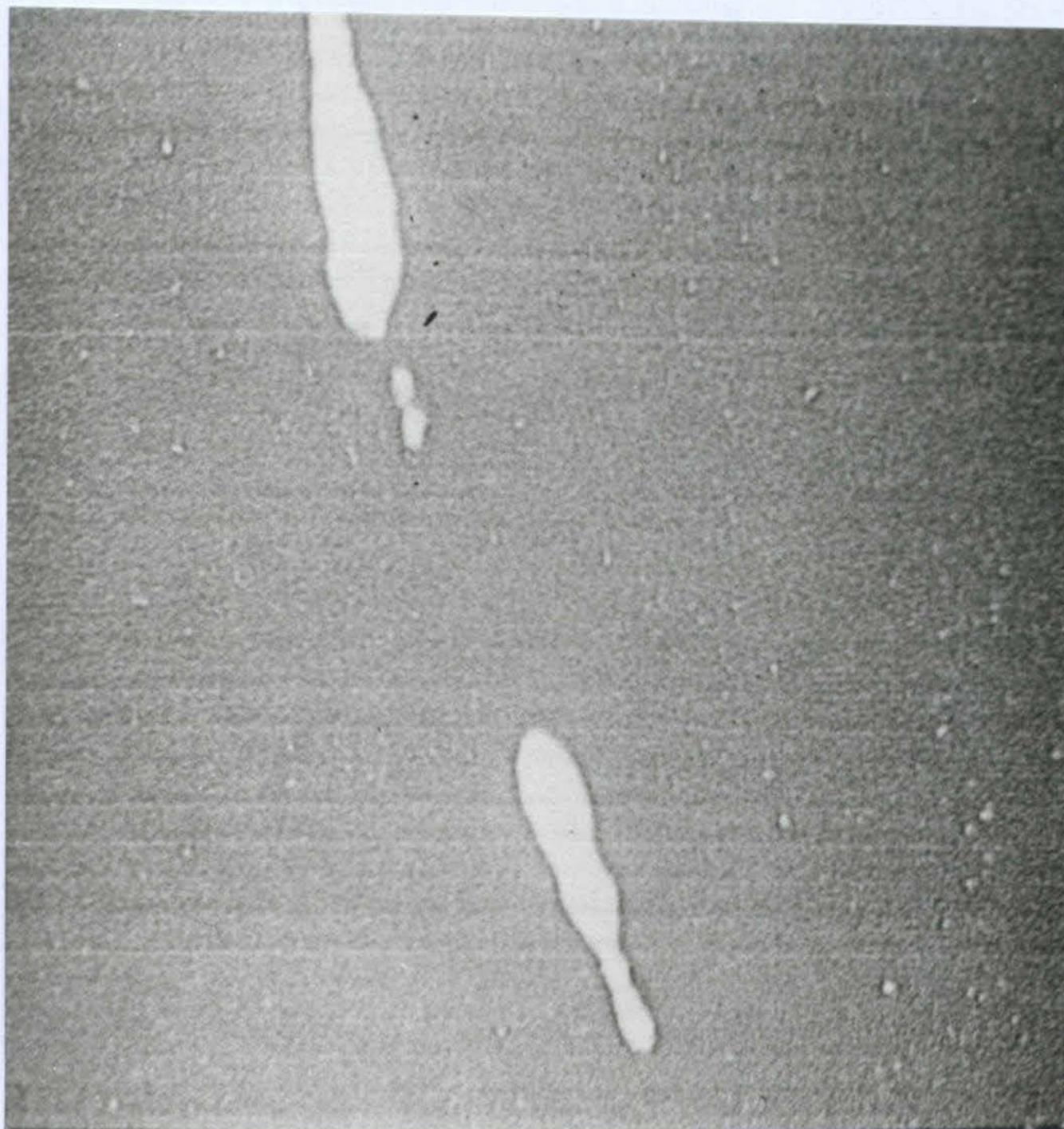
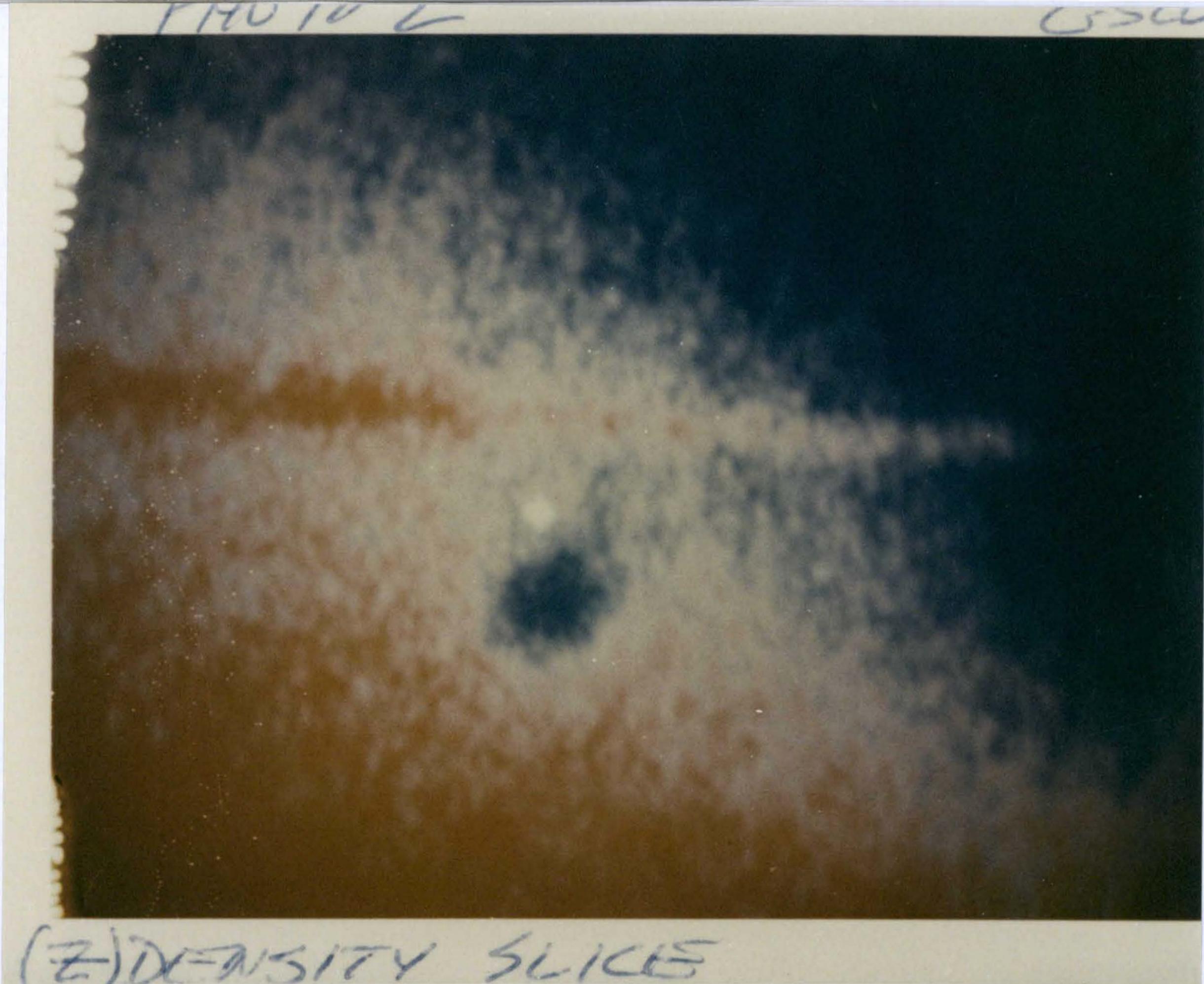


FIG A7 P66 GSW  
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GSW No 2



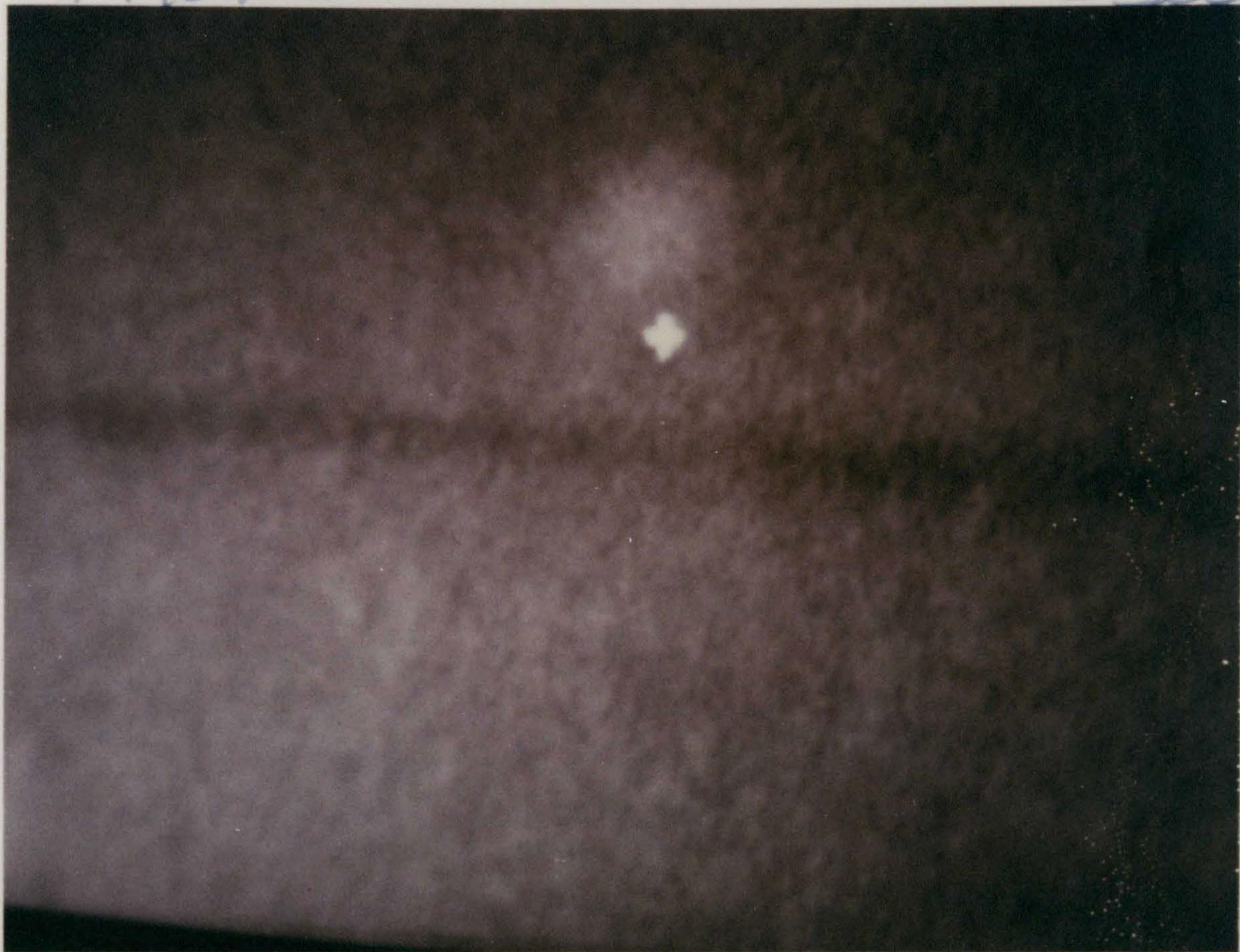
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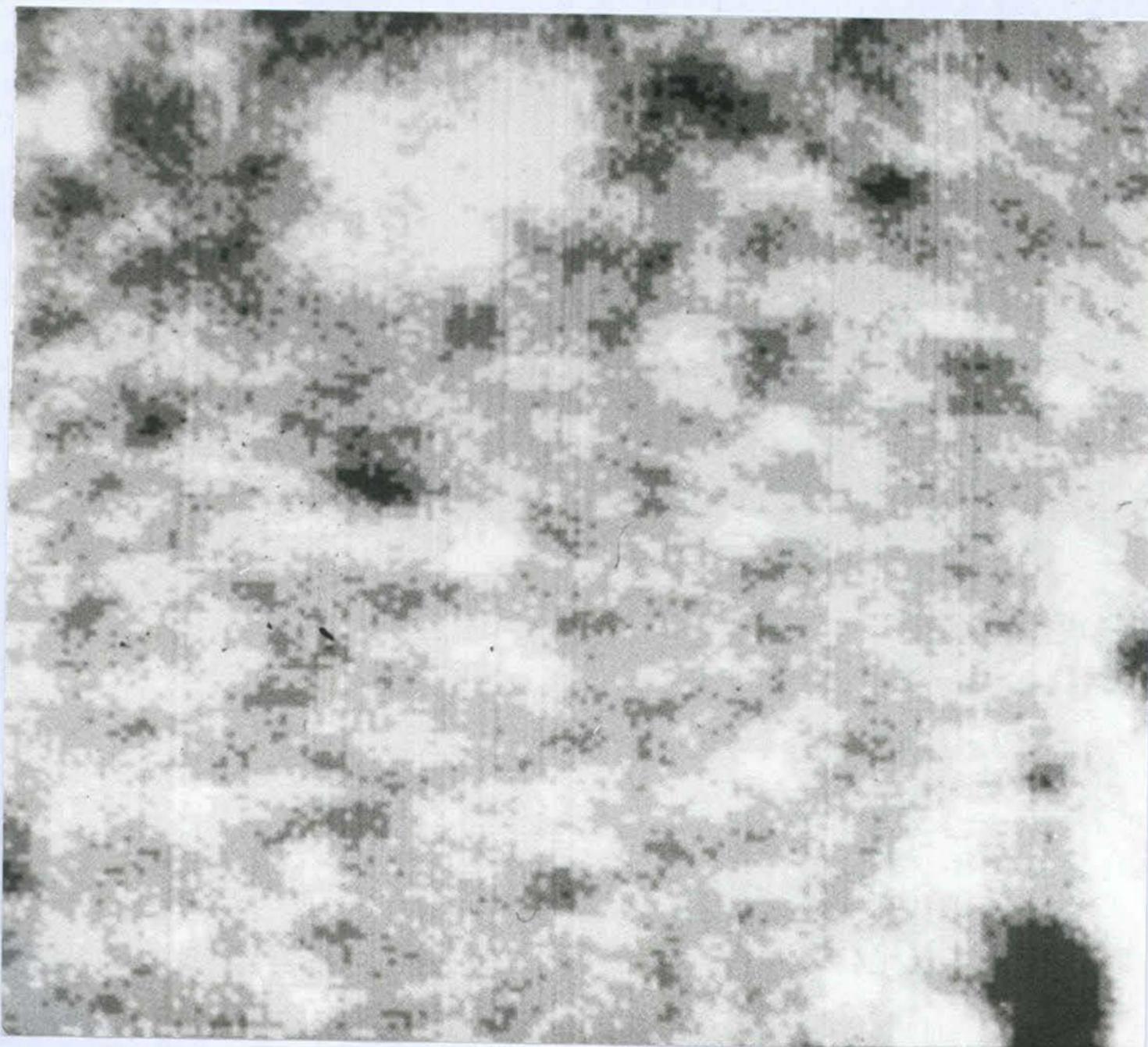
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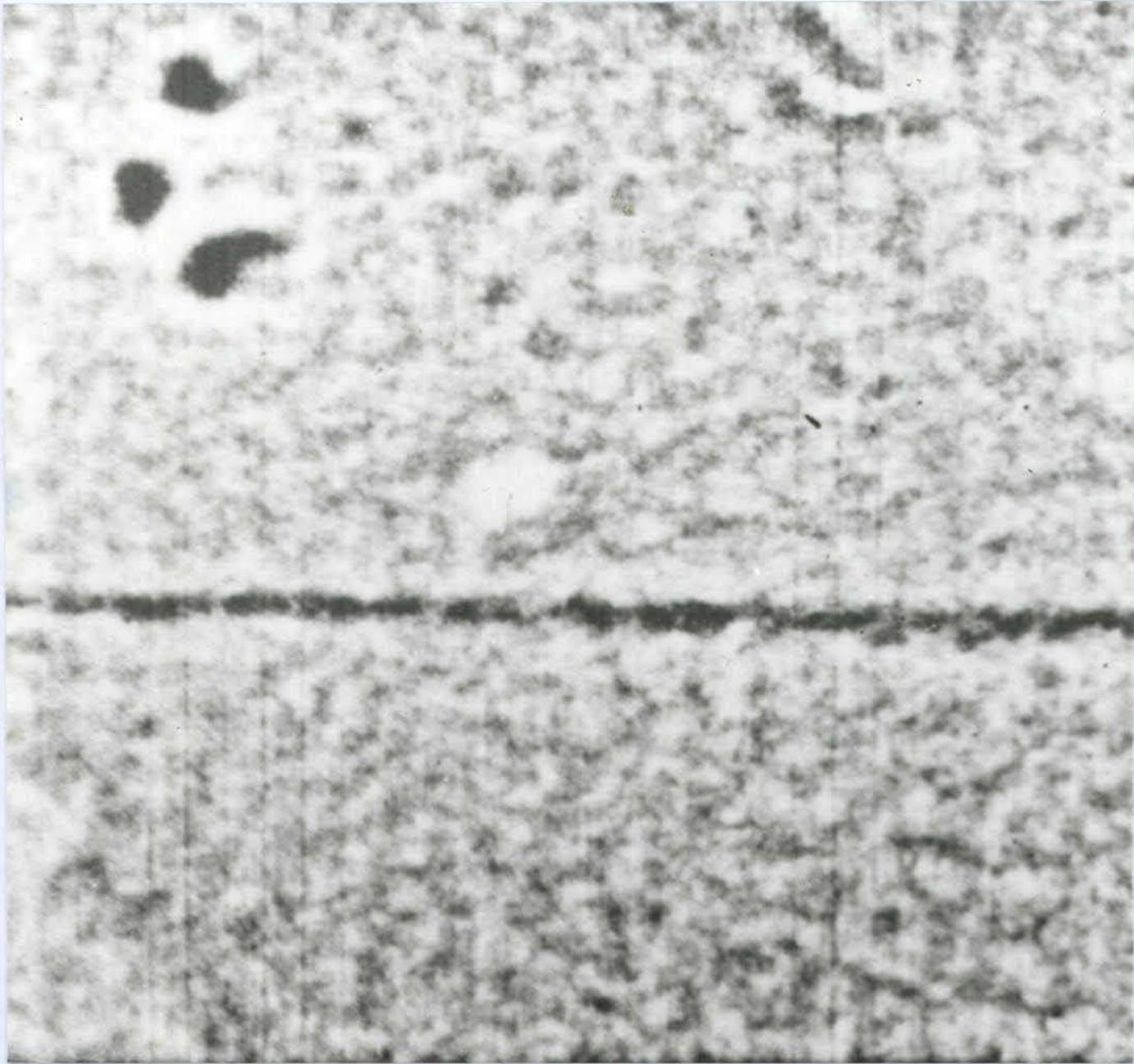
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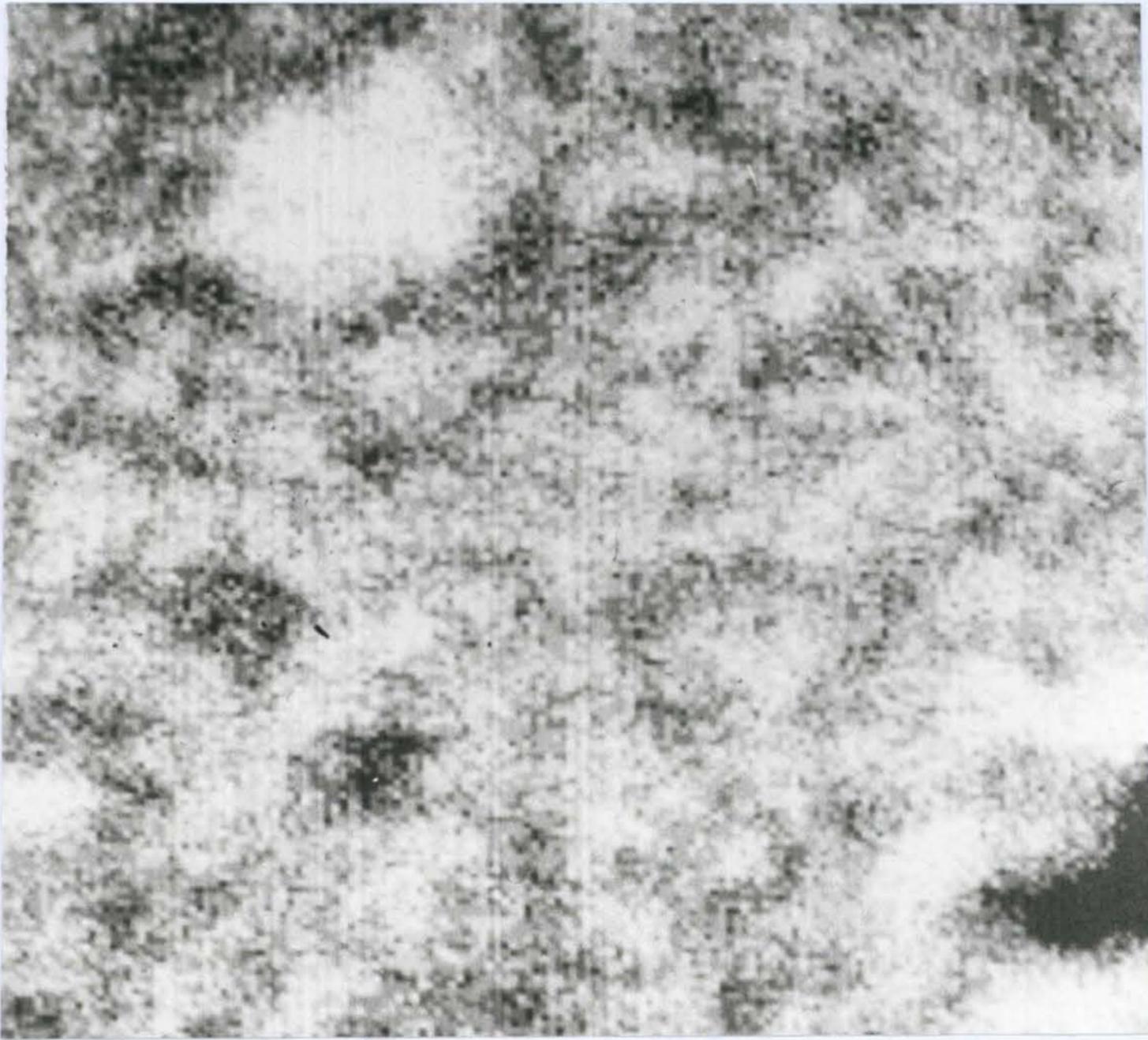
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GSW No 2.





GSW No 2.



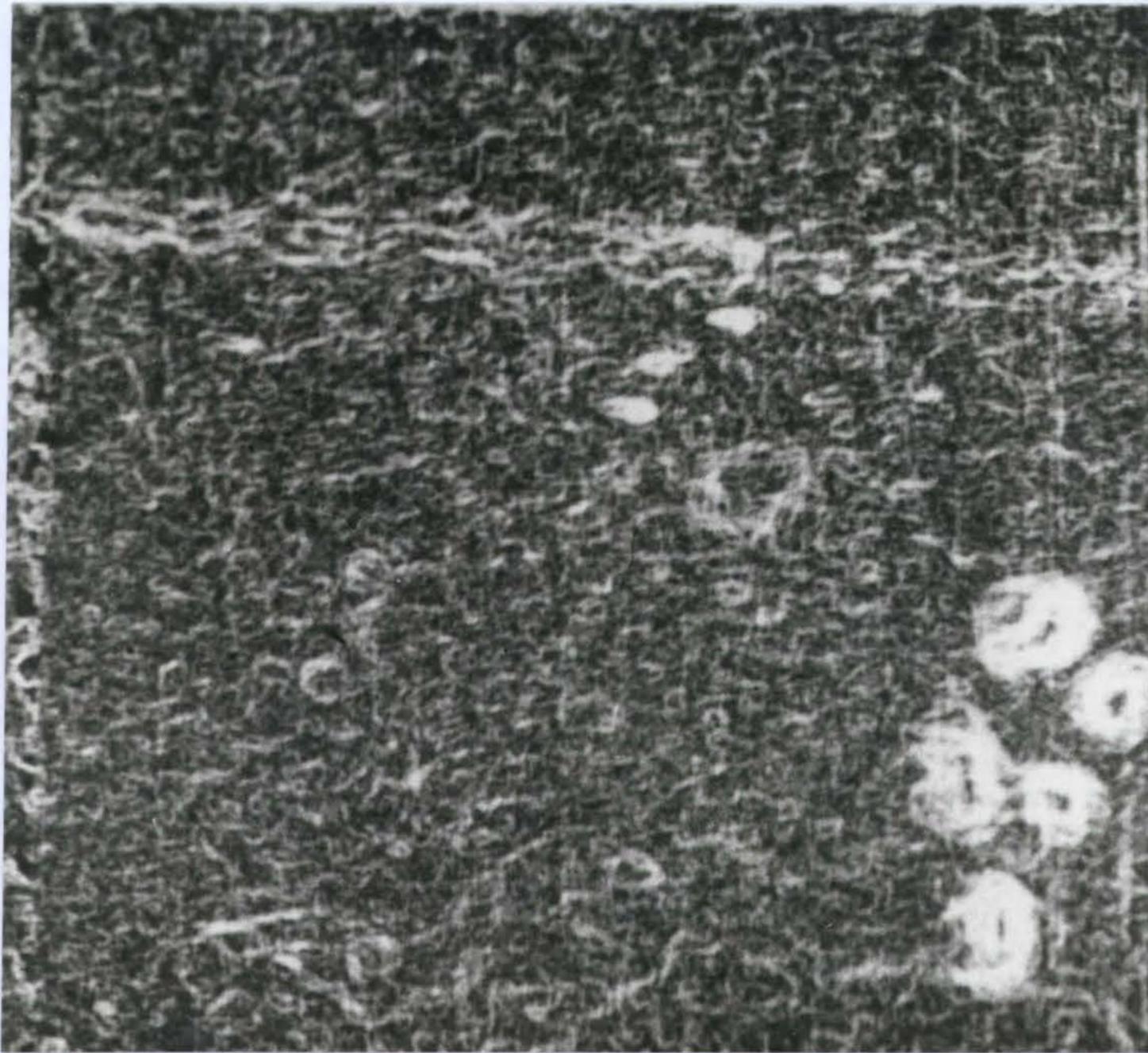
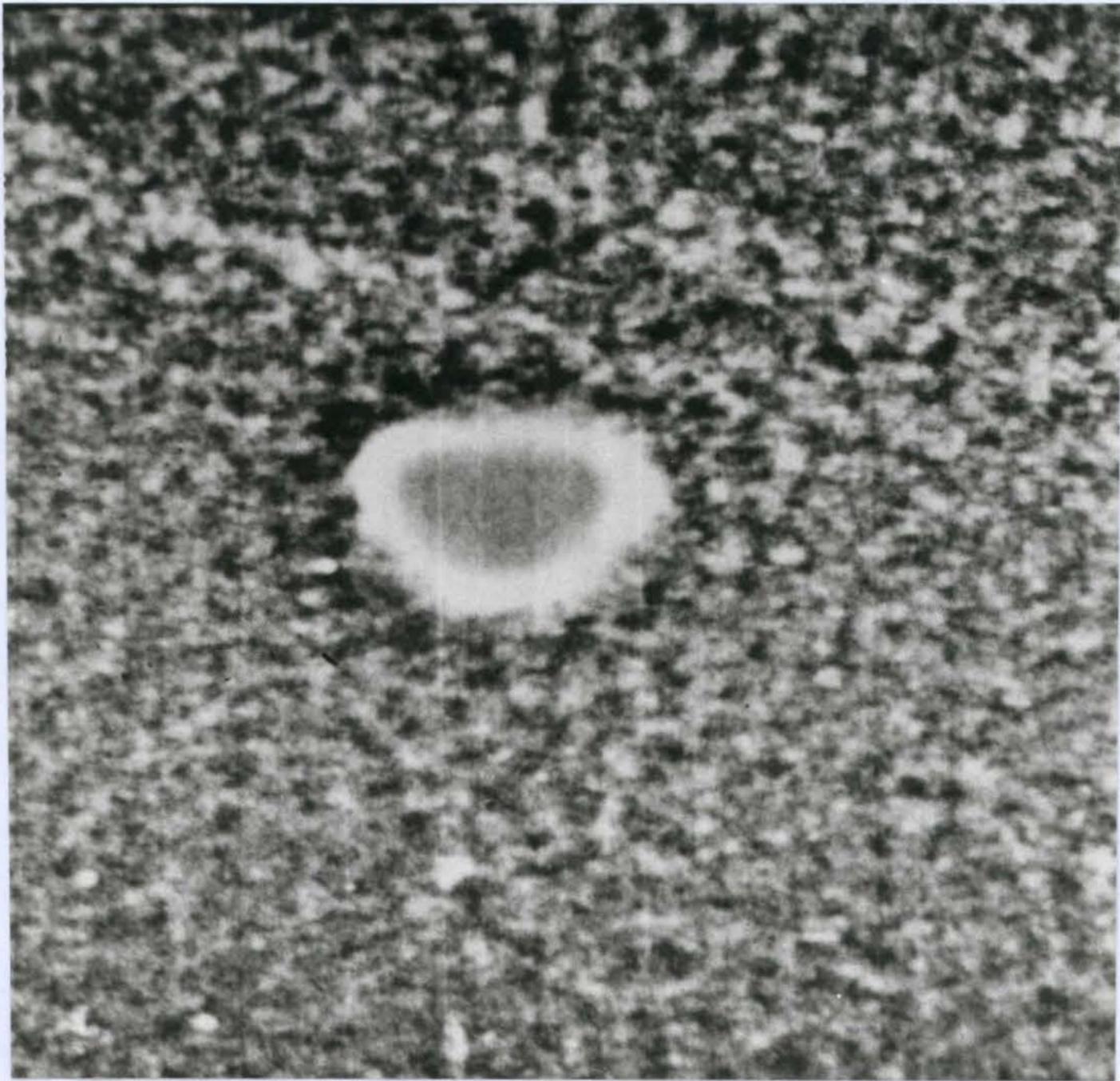
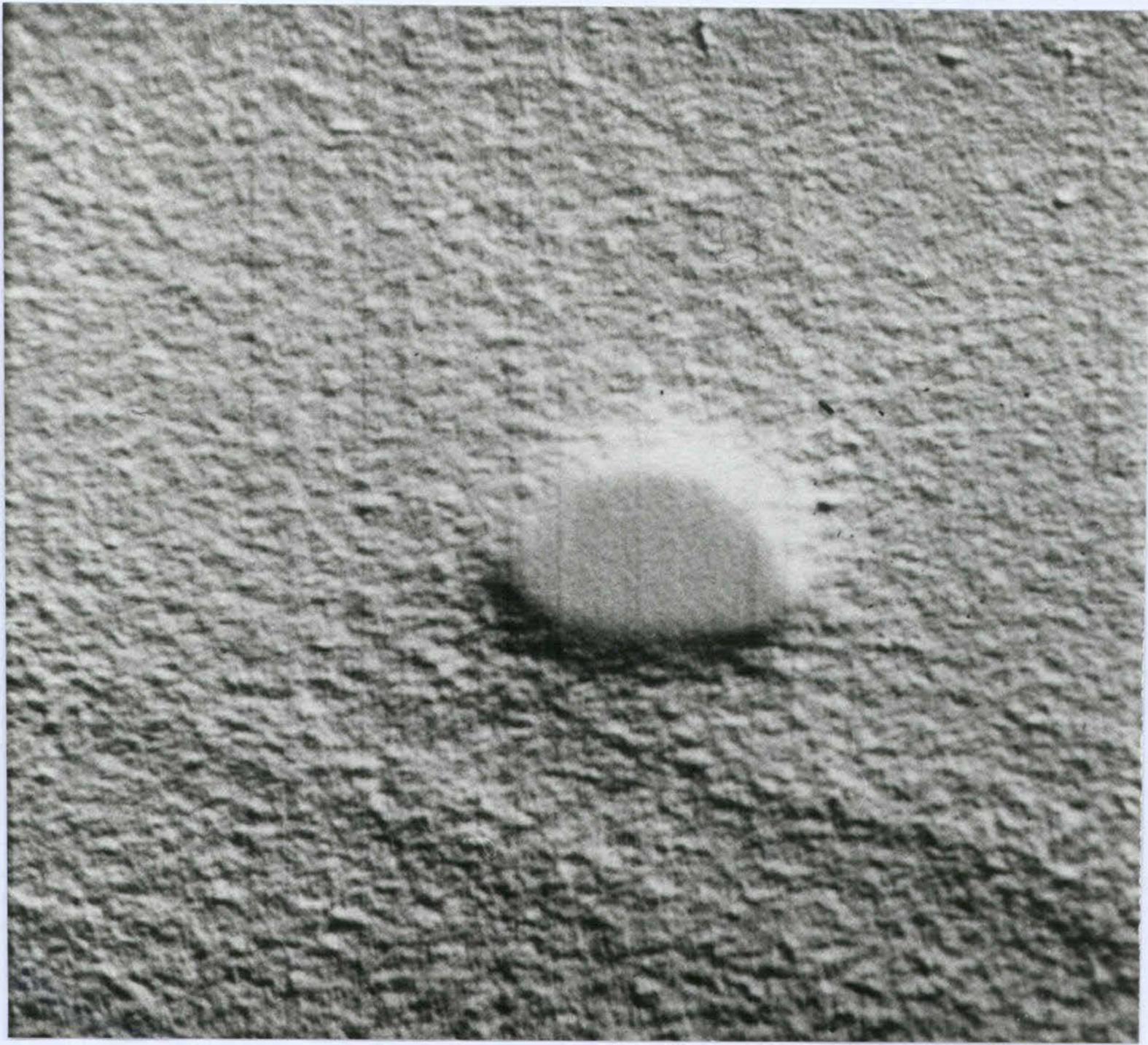


FIG A3 P64 GSW No 3.





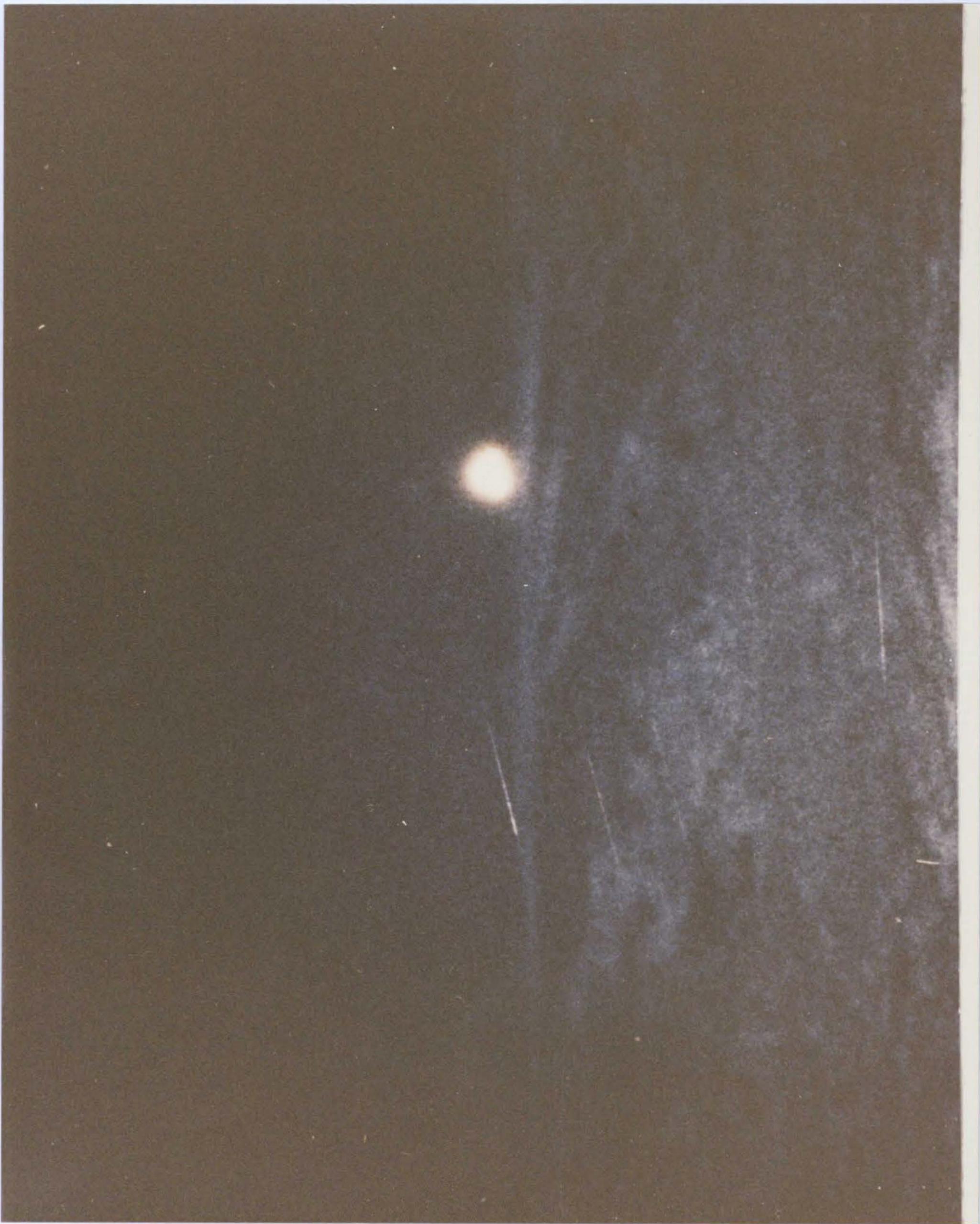
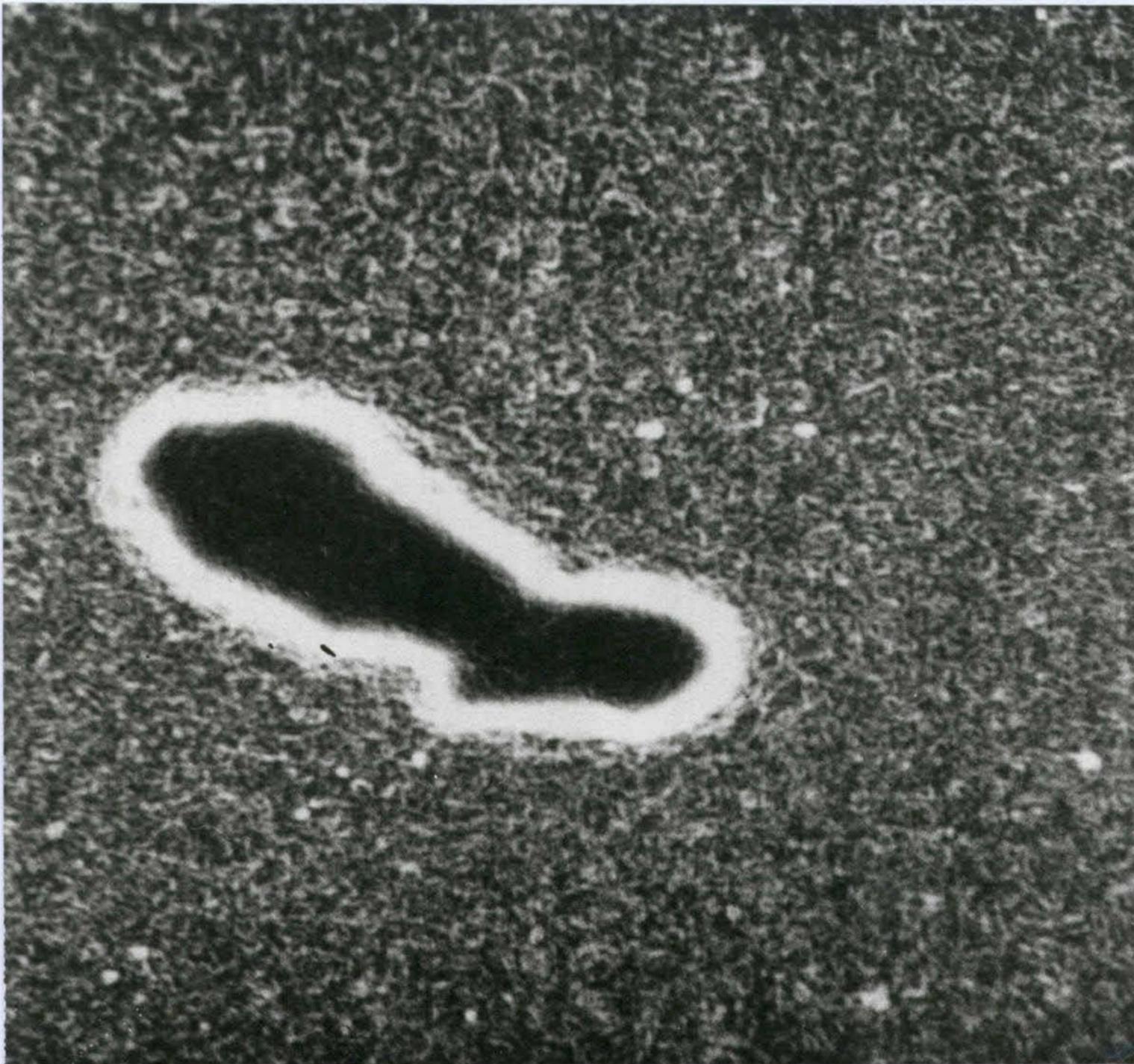
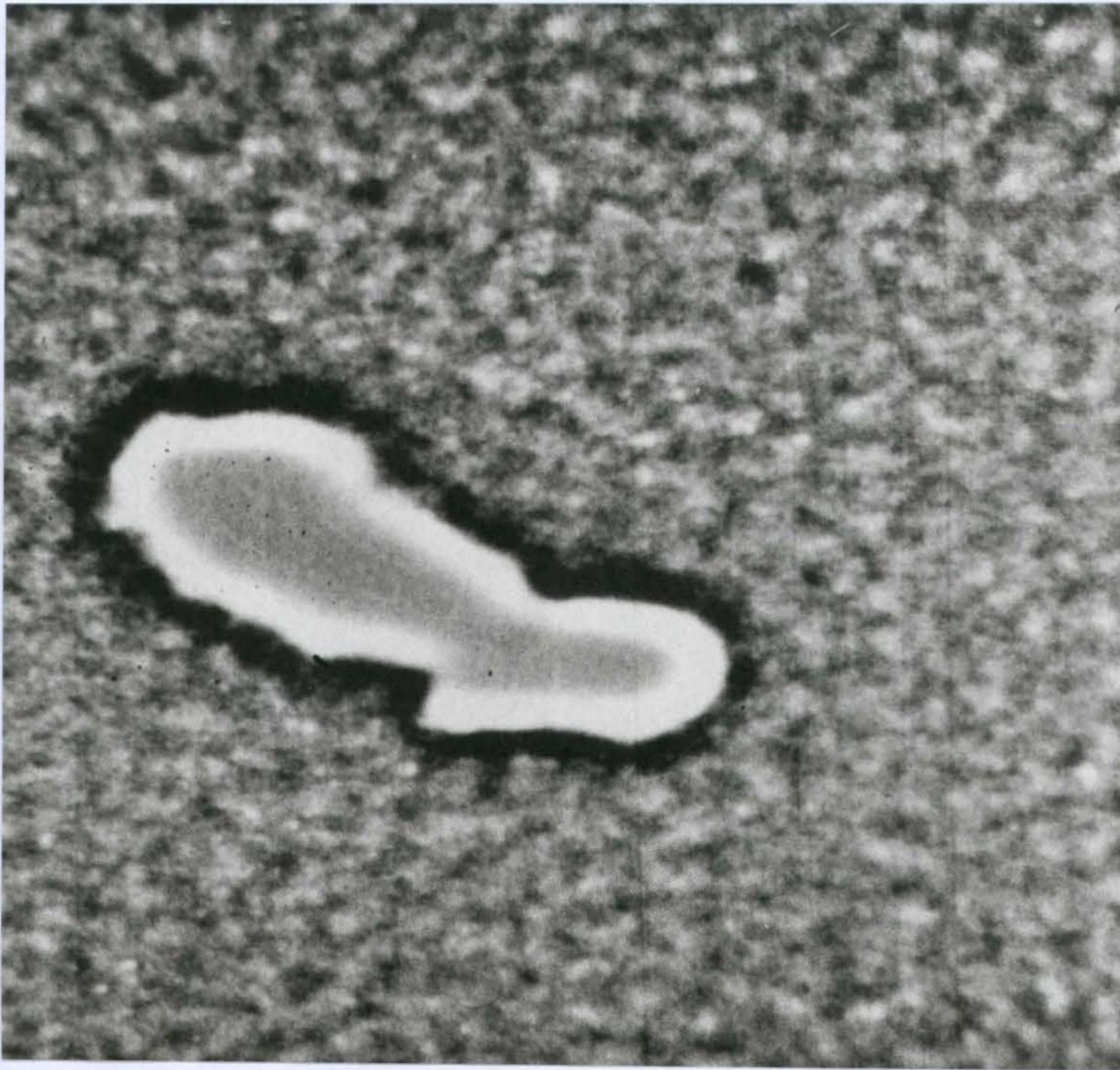


FIG A1 P64 ESW NoA





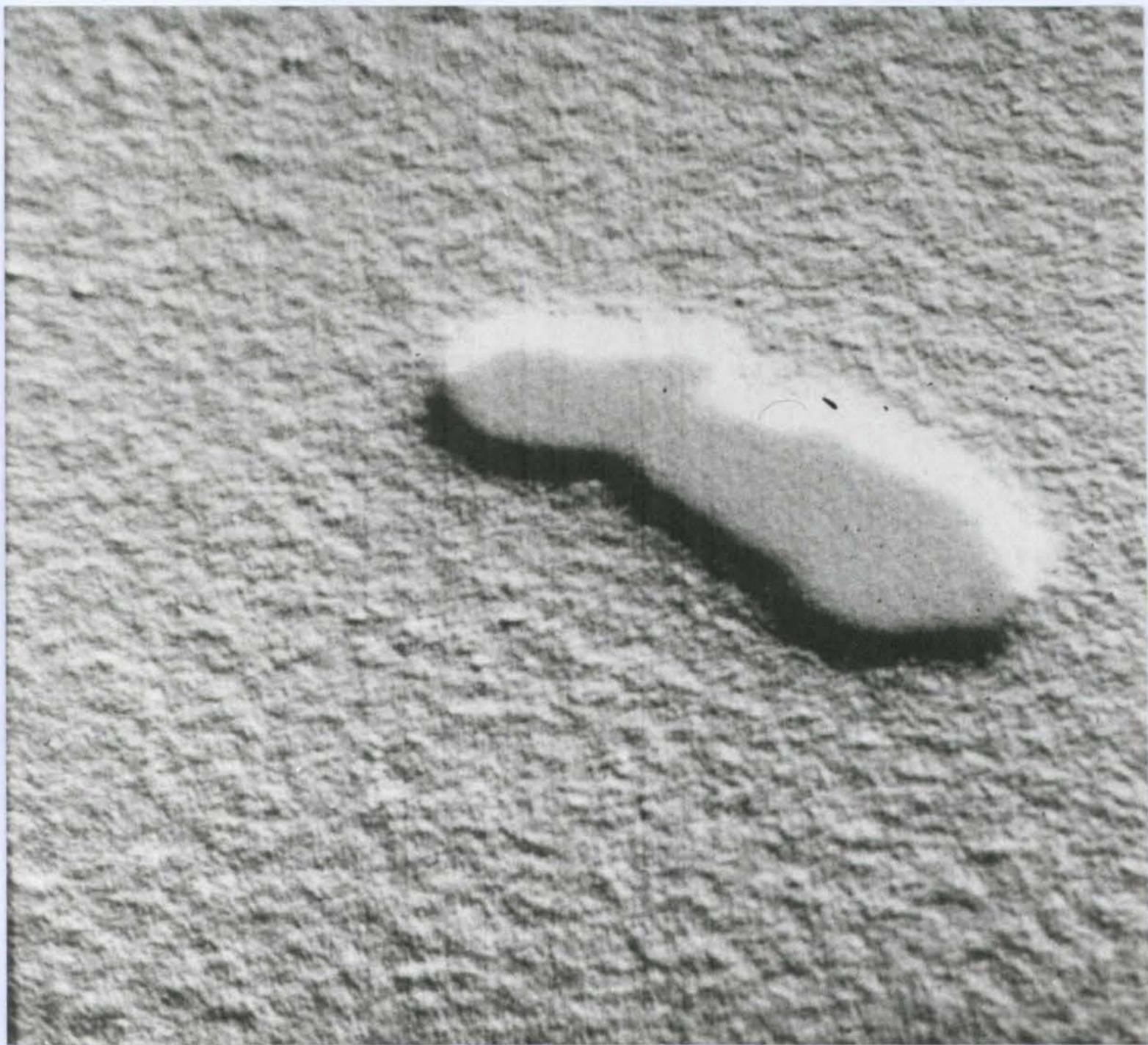


FIG A1 P64 GSW No 2



GSW

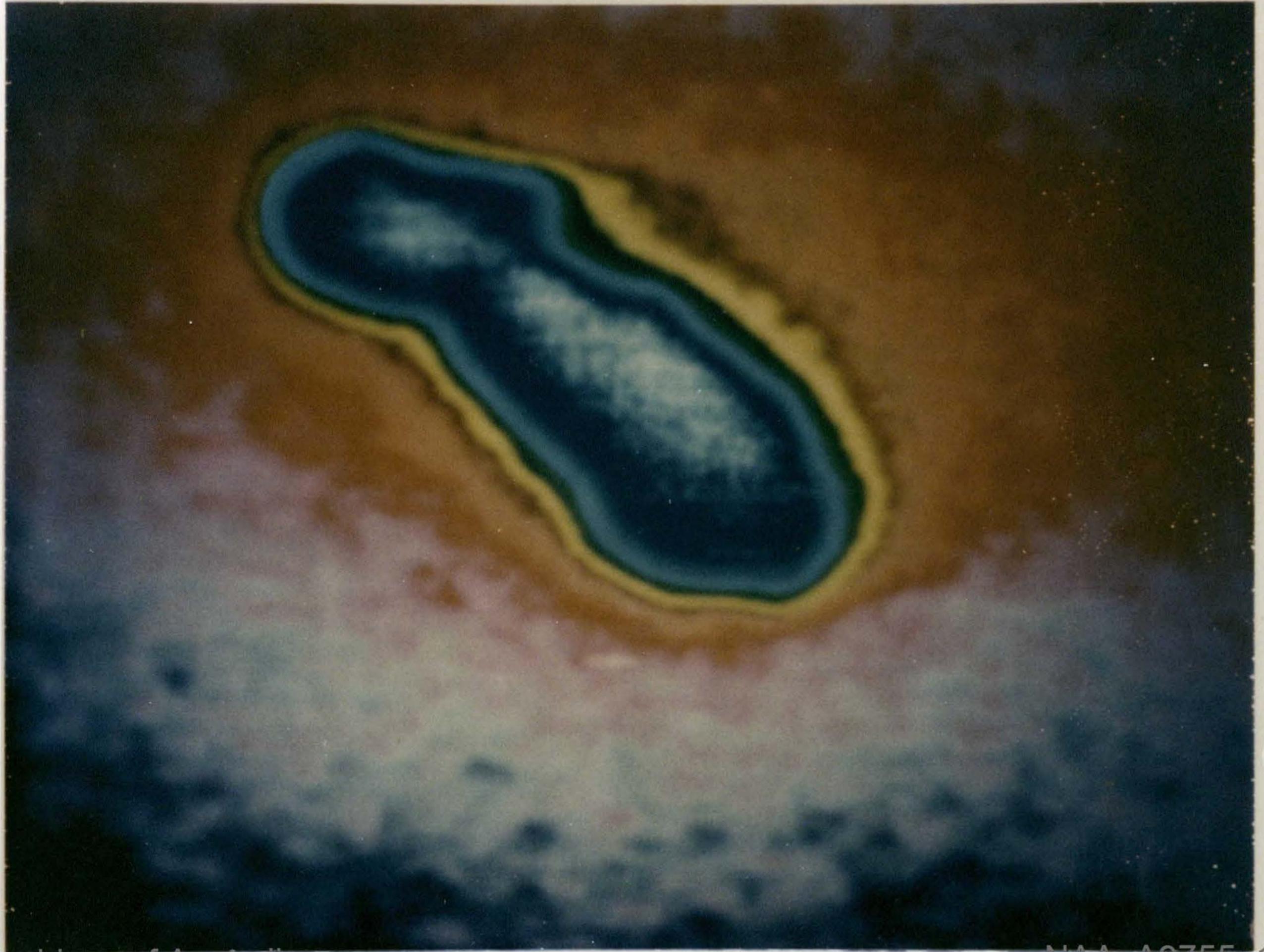


FIG A4 P65 BSW NOS.





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FIG A4, A5 P65 GSW No6.

GSA





FIG A6.P65 BSW No 7.



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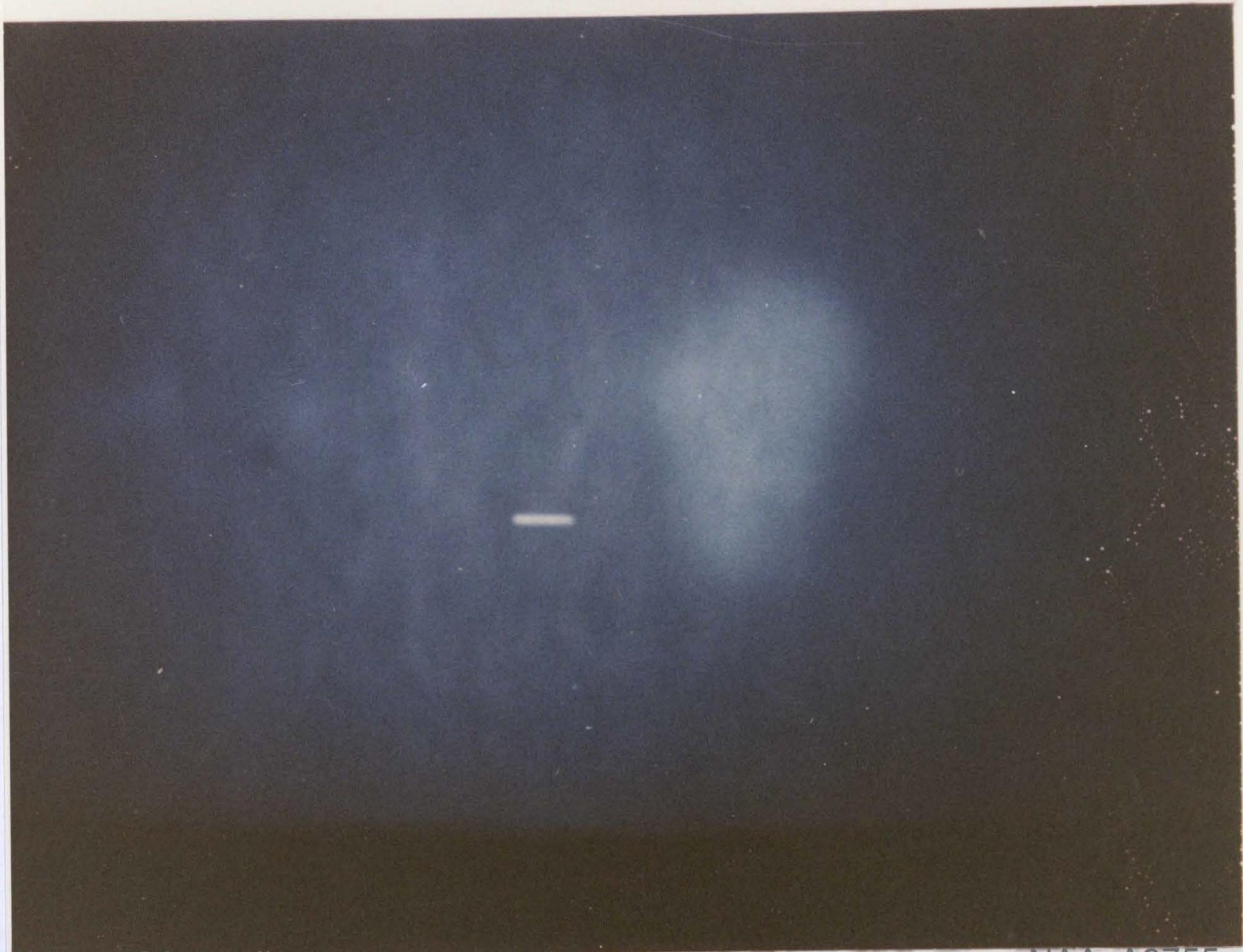
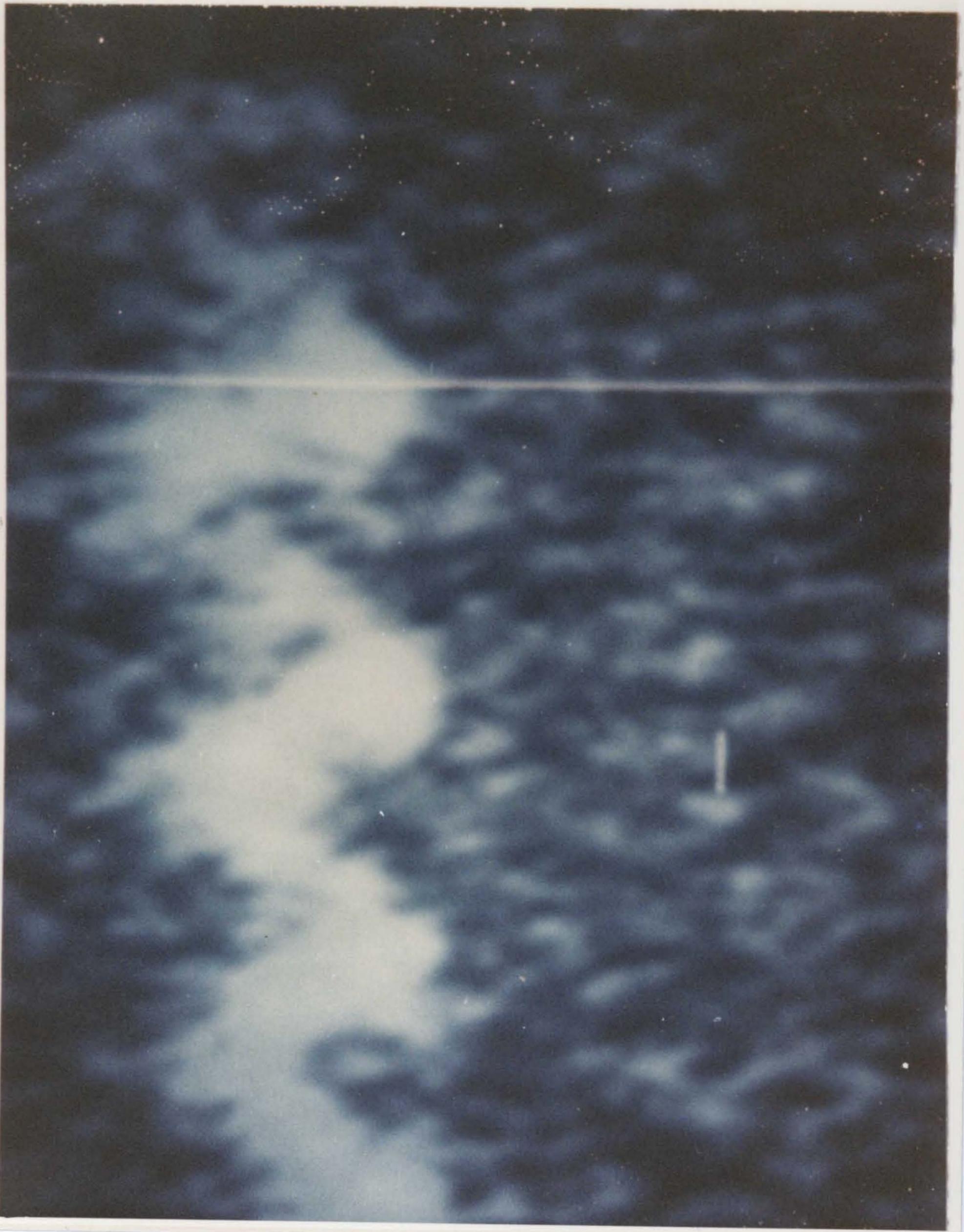


FIG A8 . P66 GSW No 8.



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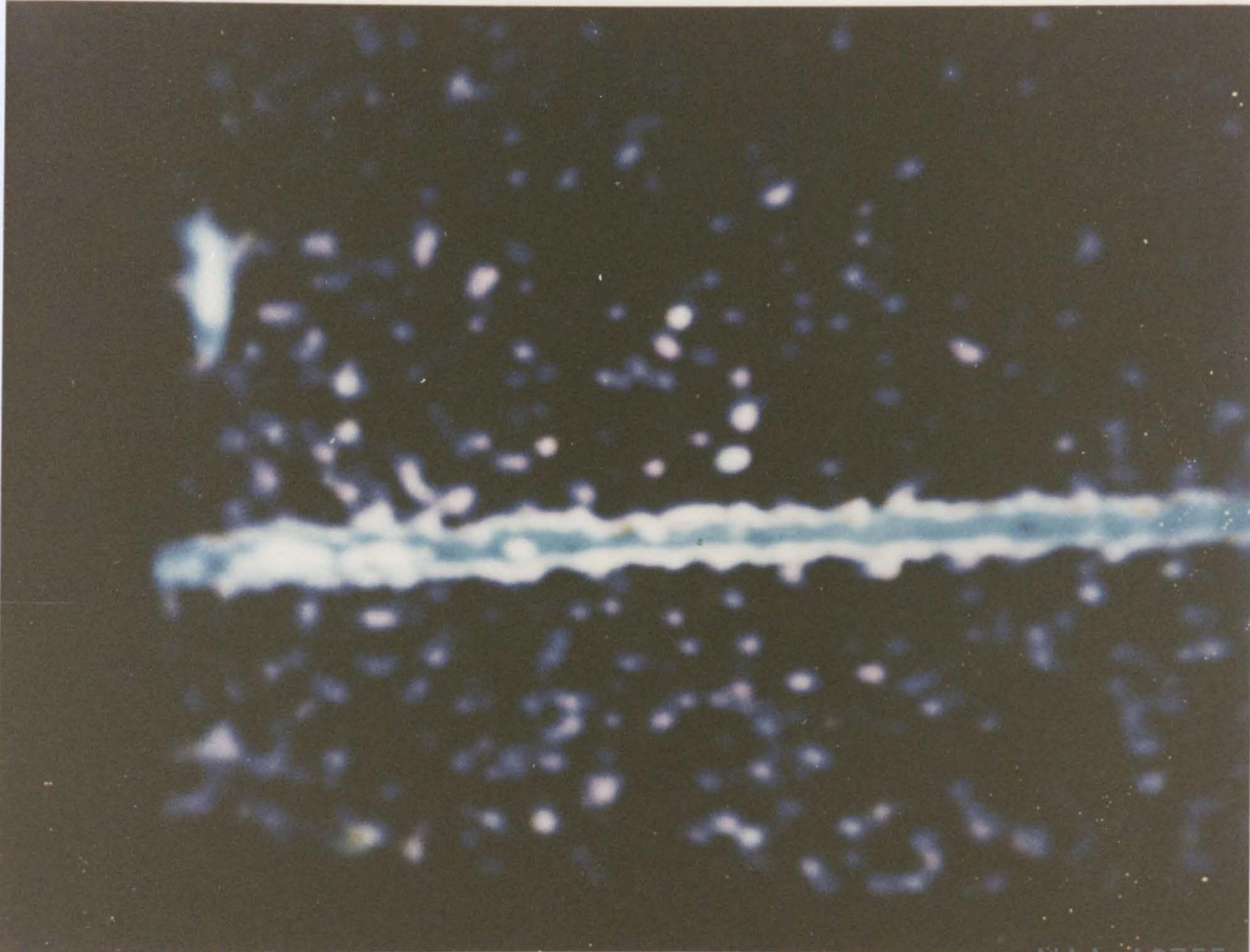
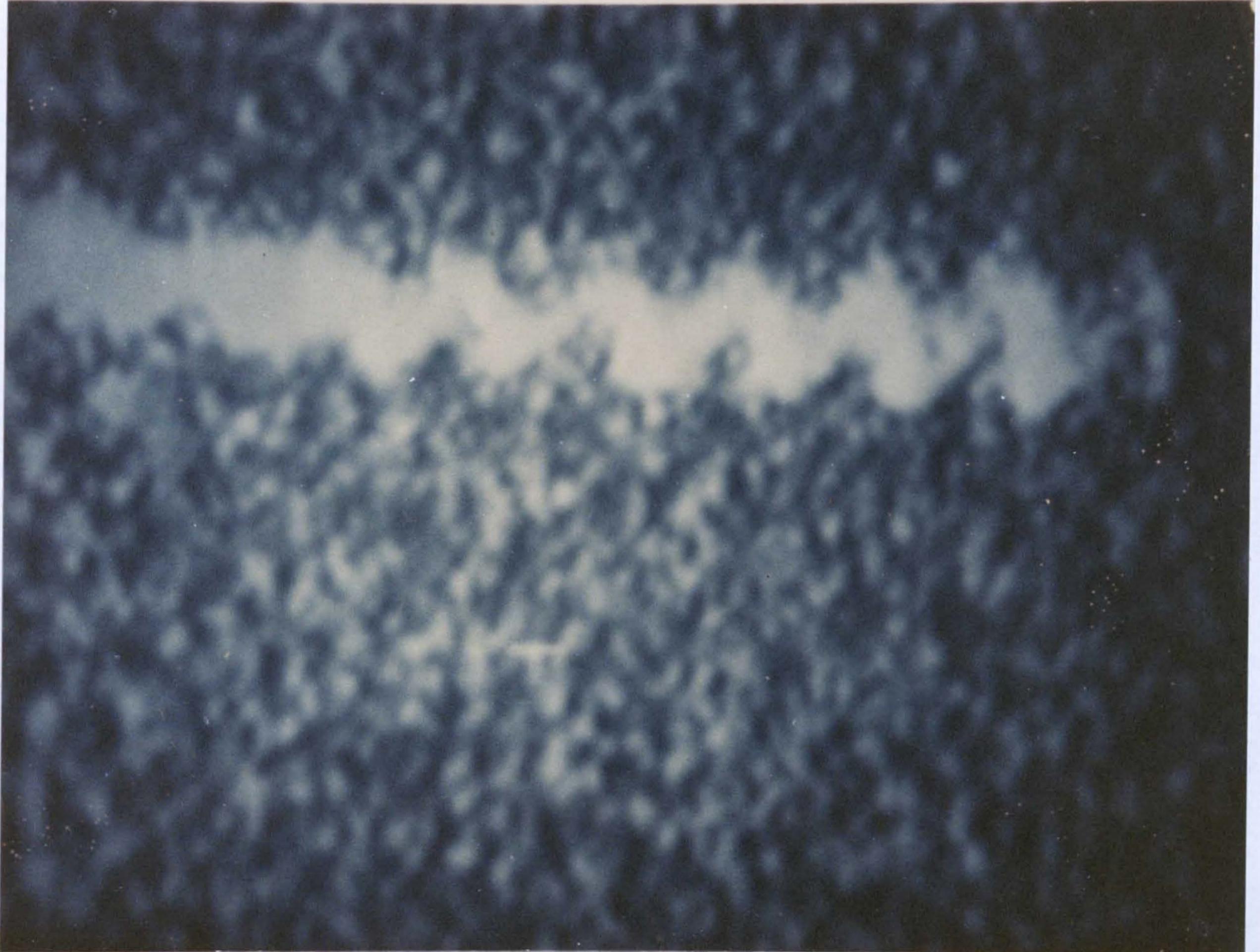


FIG A8, P66 GSW No.8.

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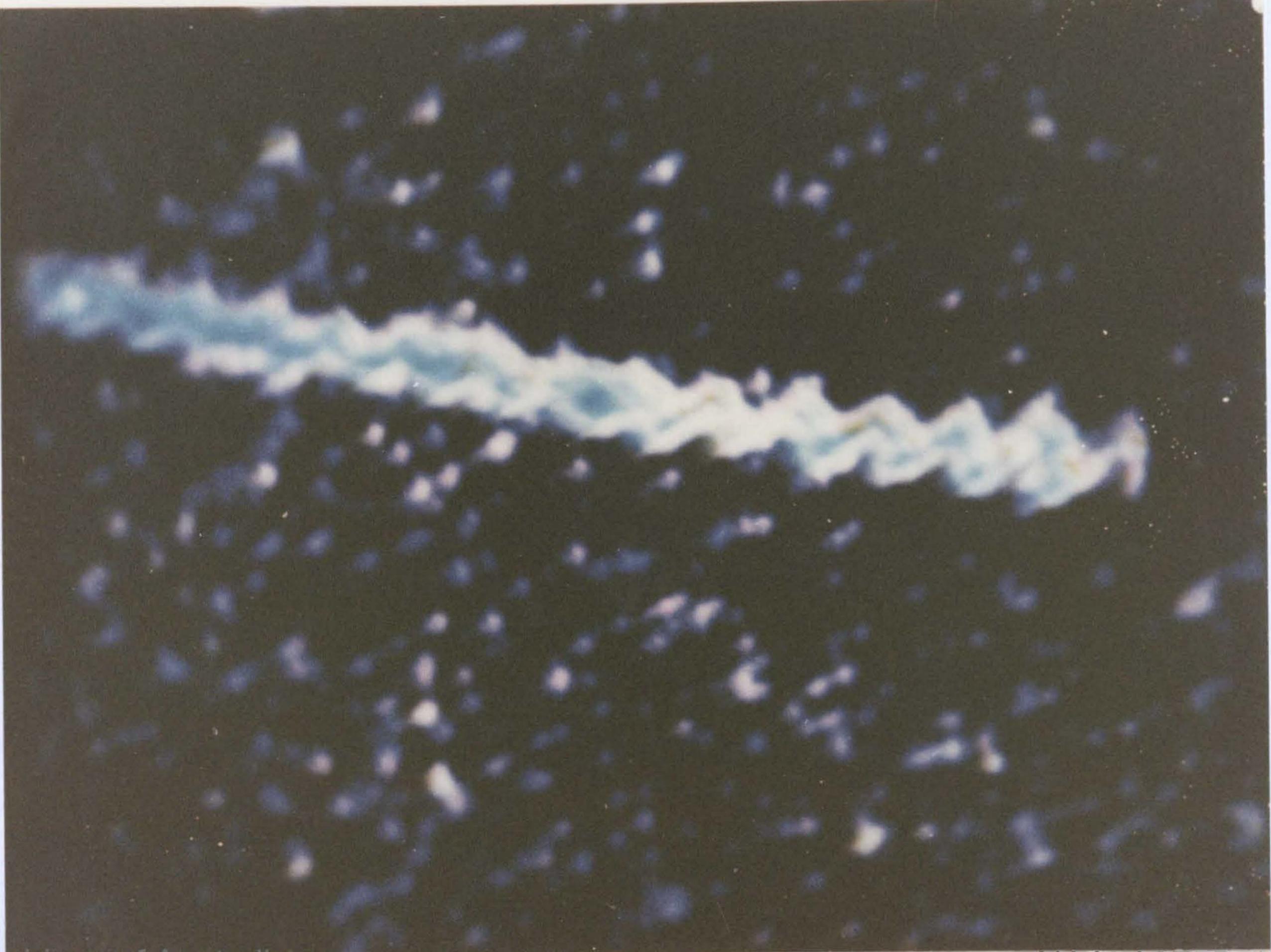
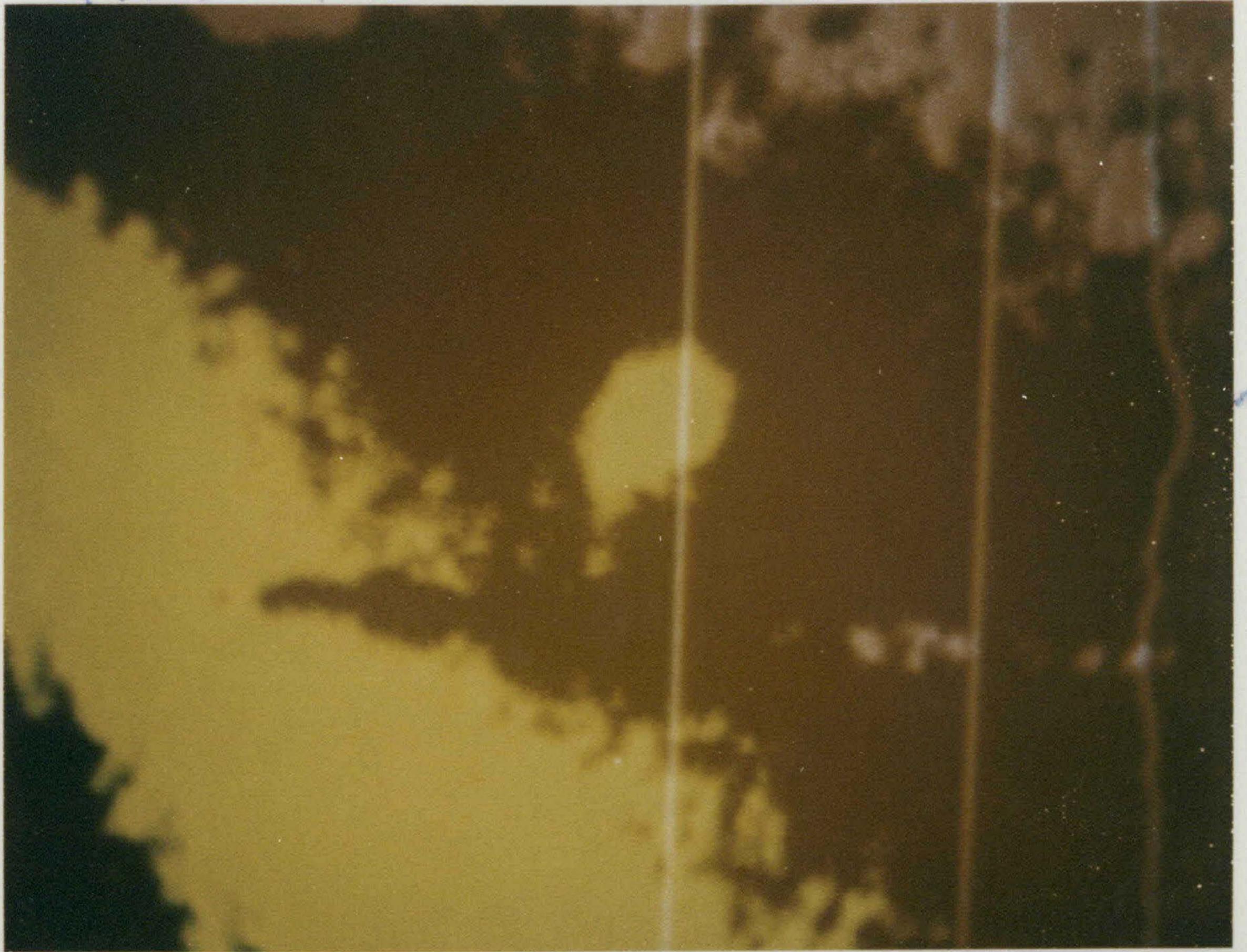


FIG.A9, A10 P67 RADAR CASE

PHOTO 1



COLOR CONTOUR

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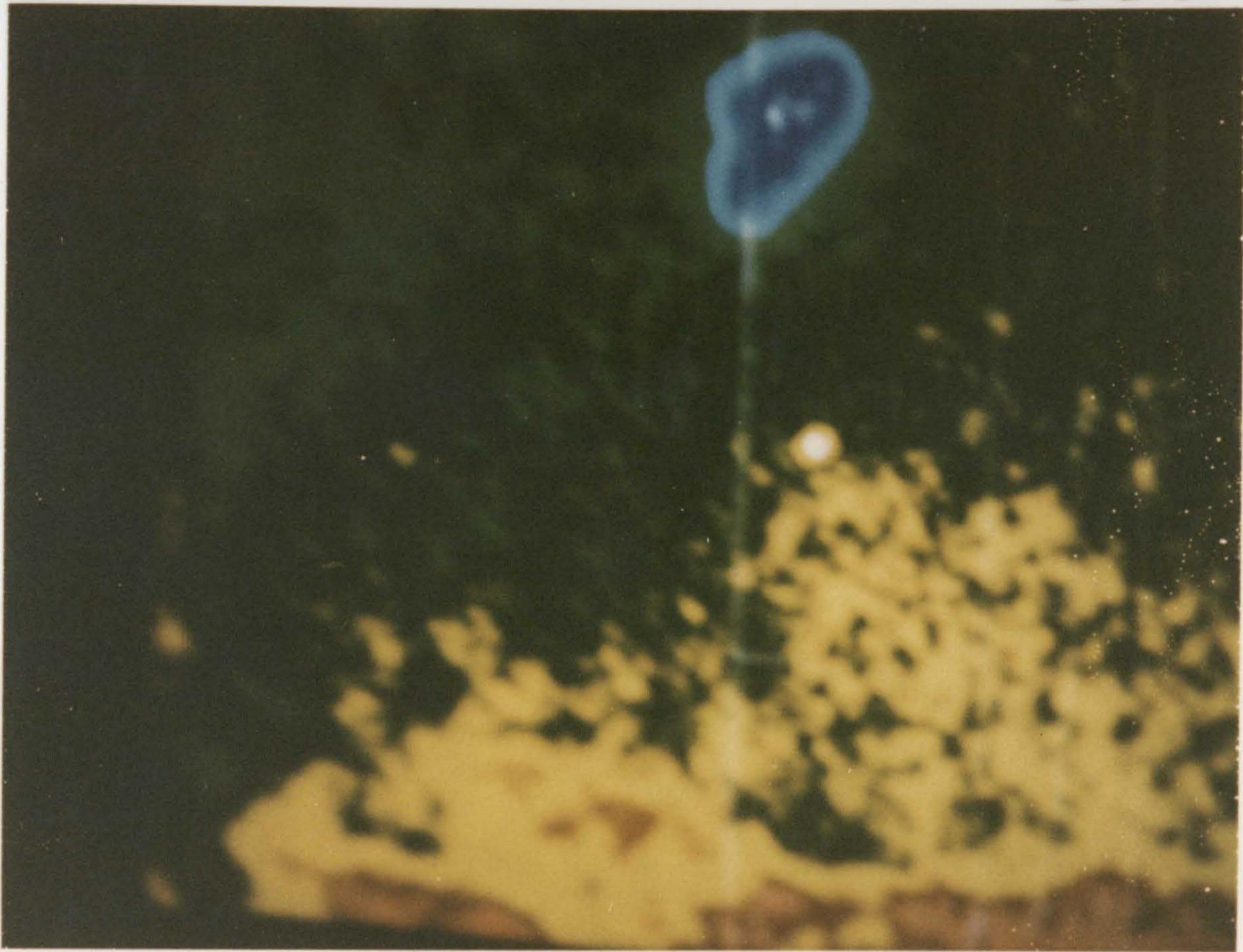
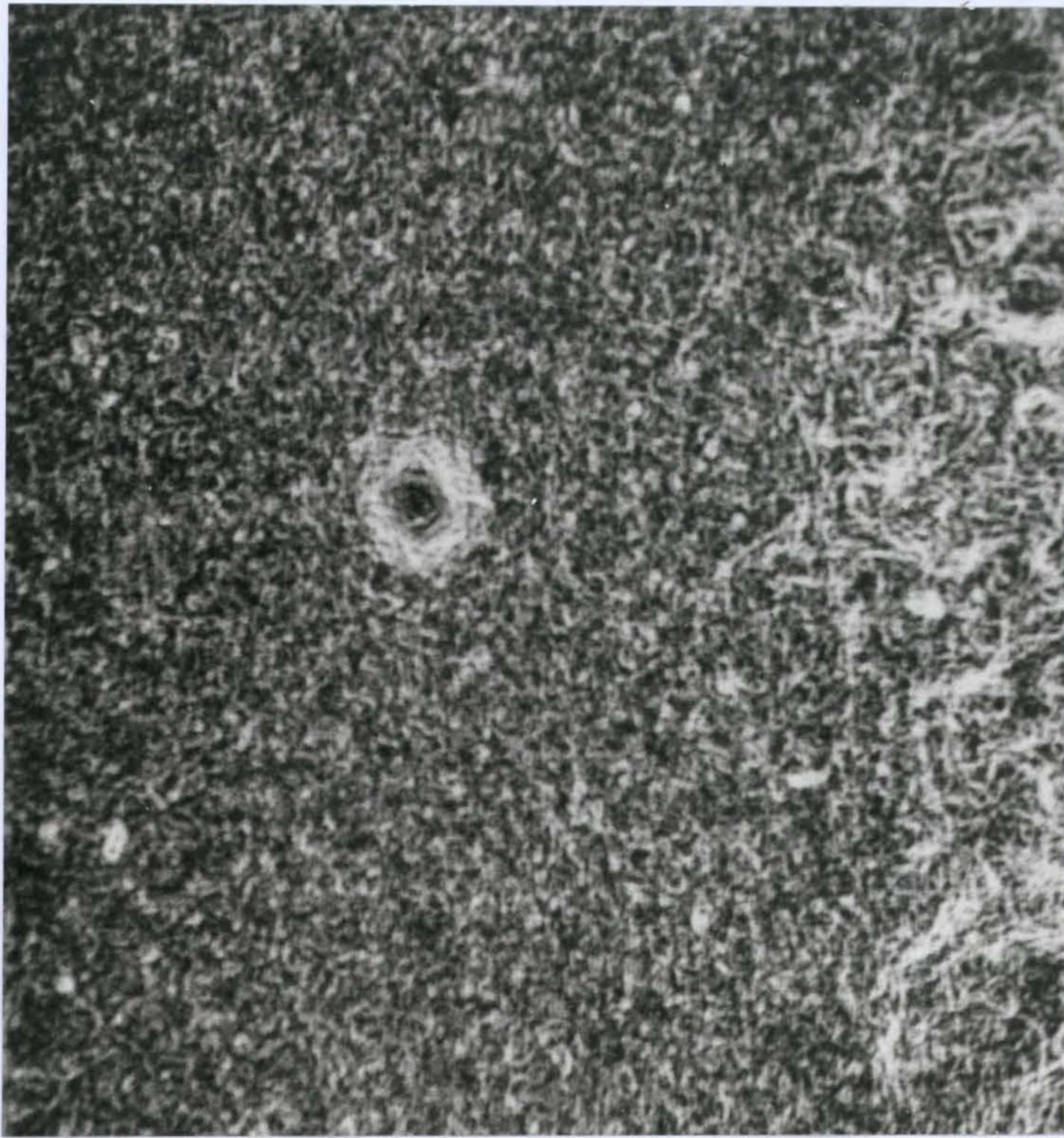
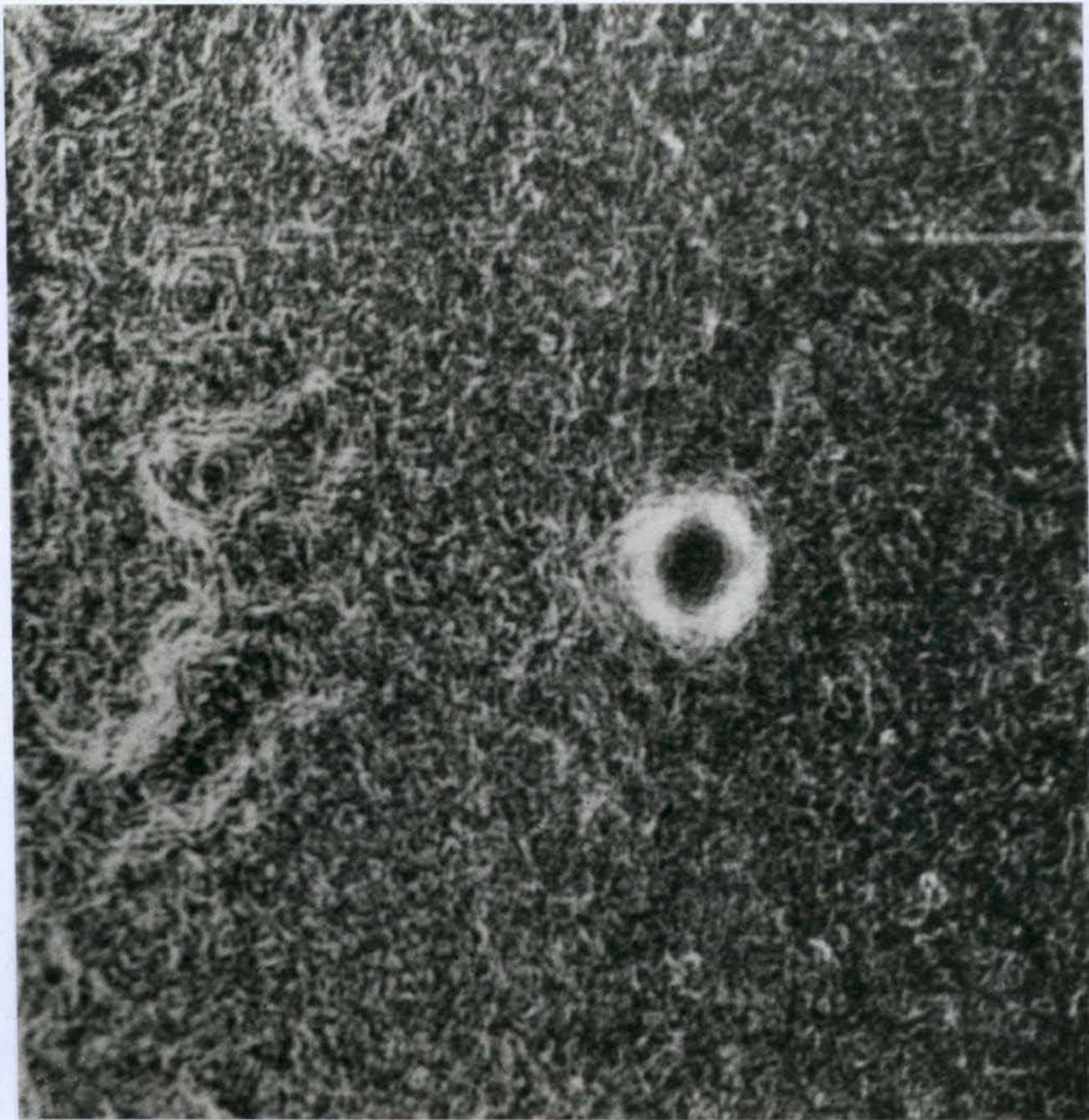


FIG A4, A5 P65 GSW No 6.





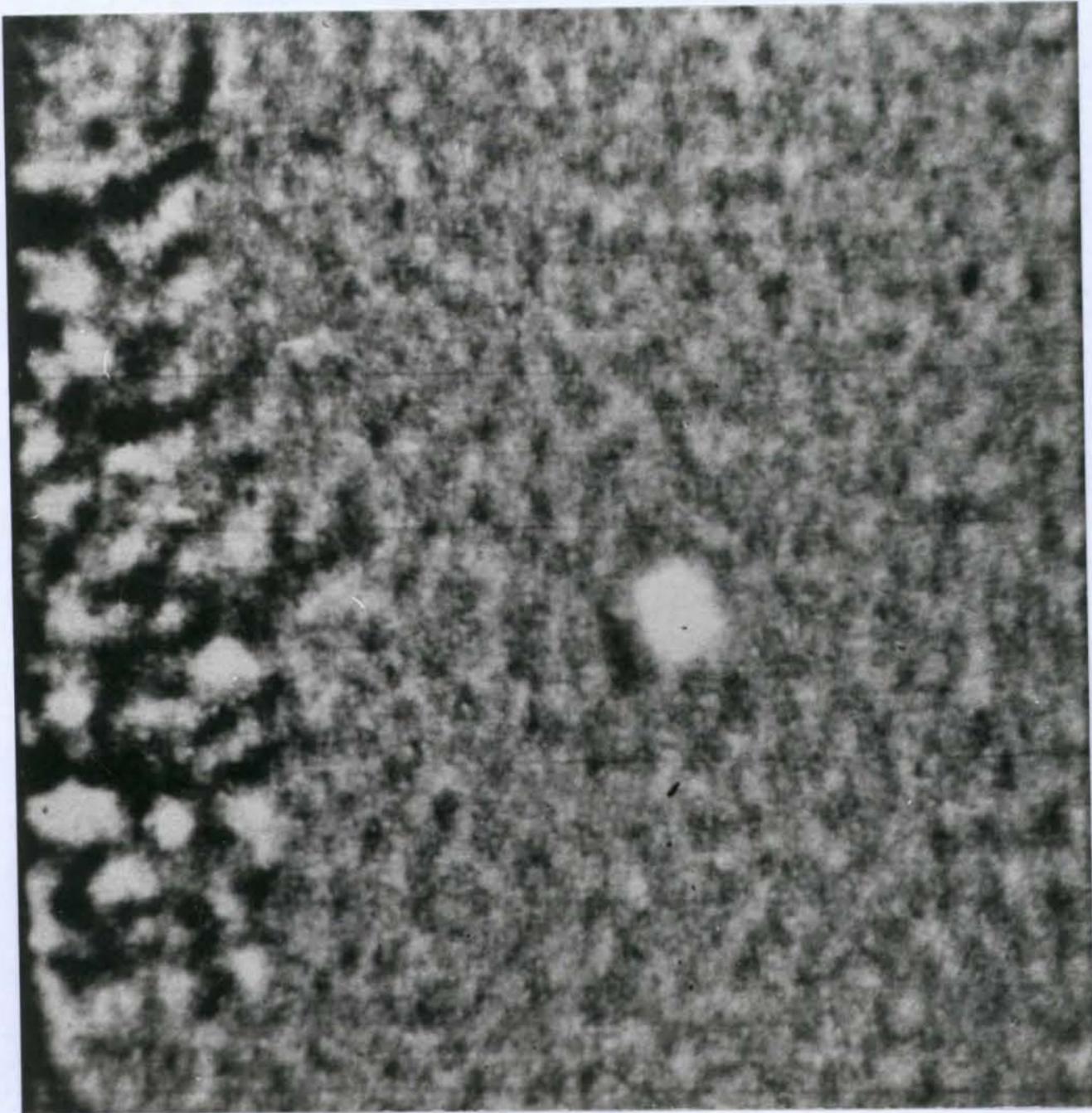
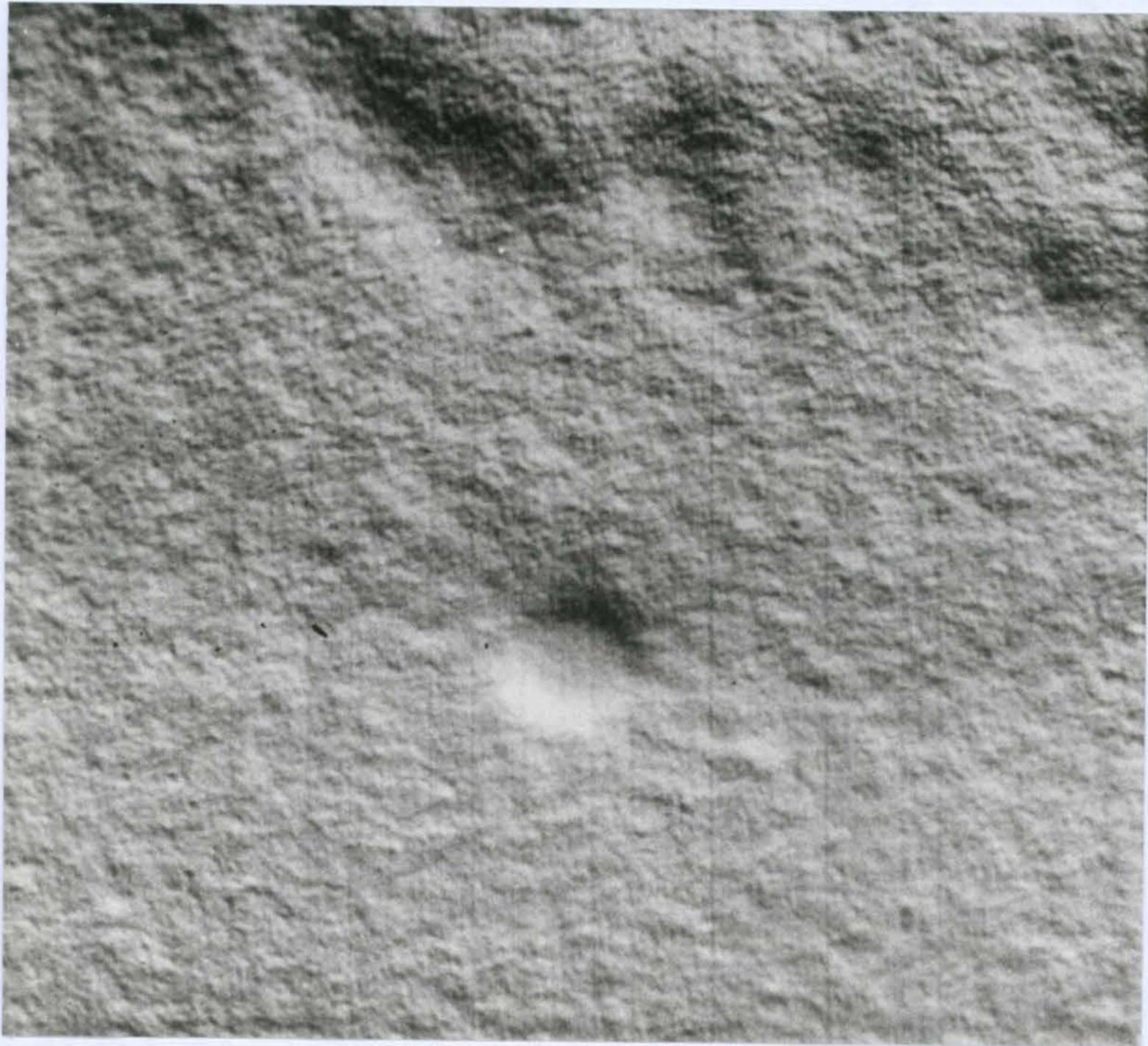
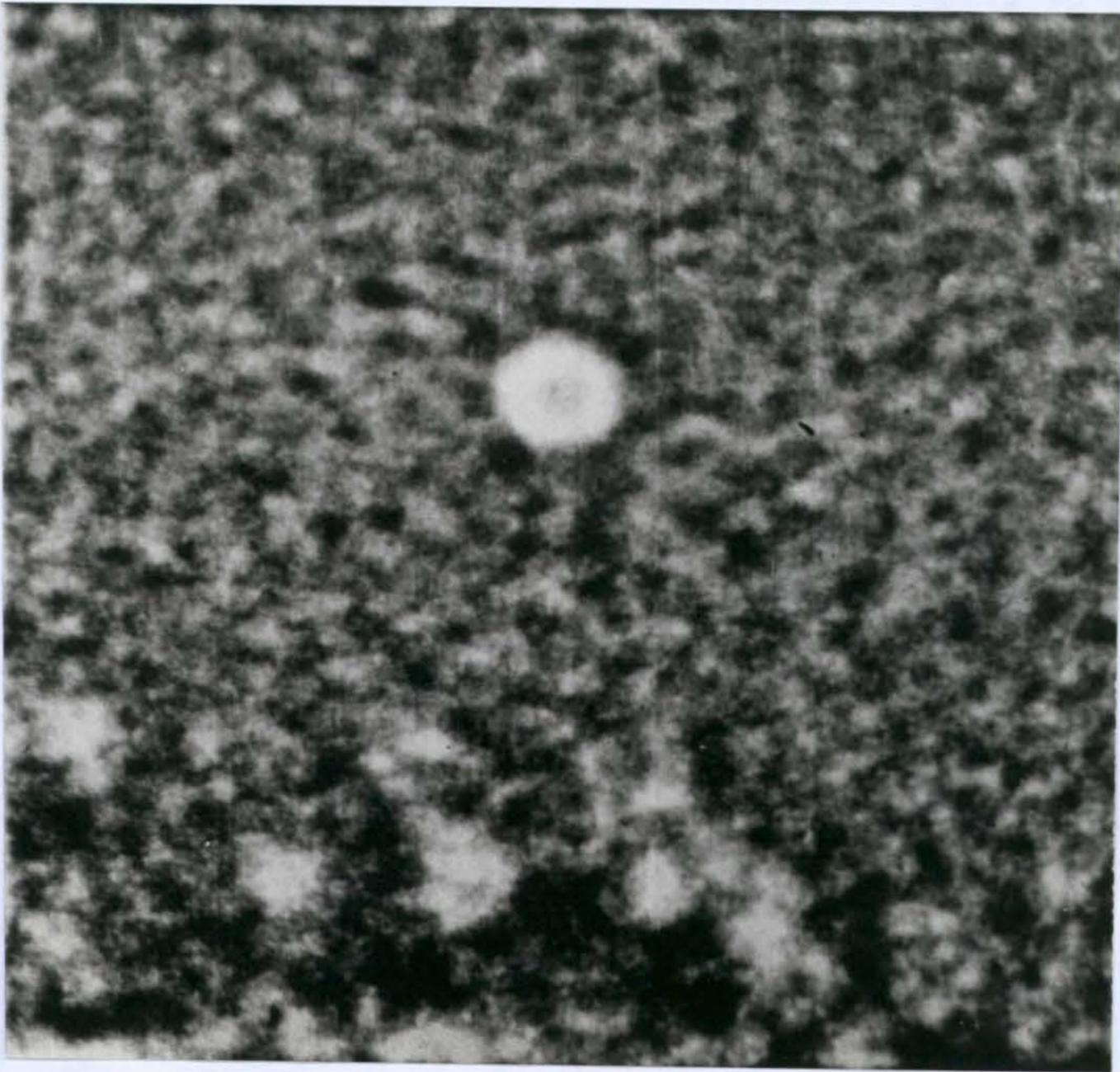


FIG A4, A5 P65 BSW No6.





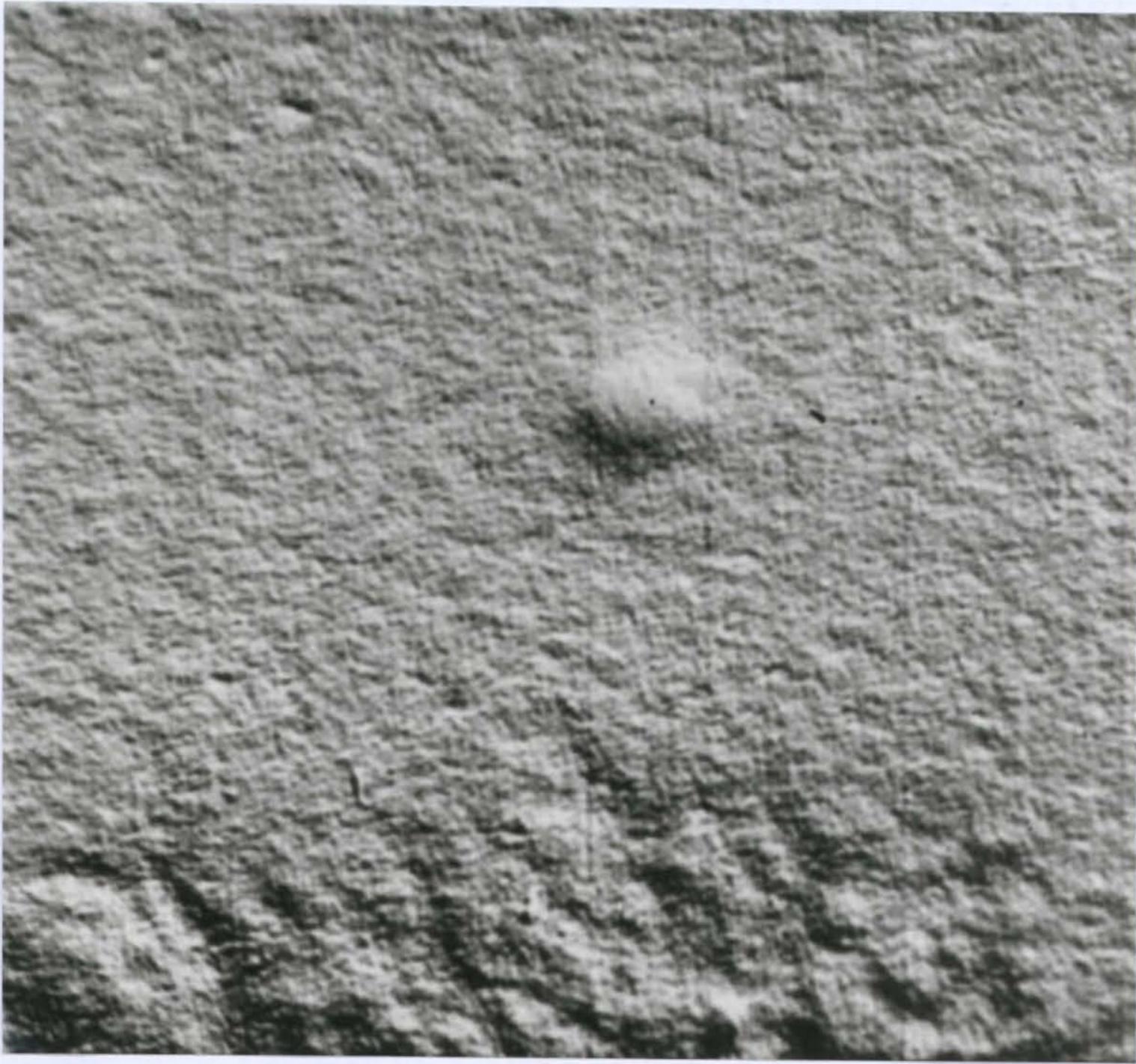
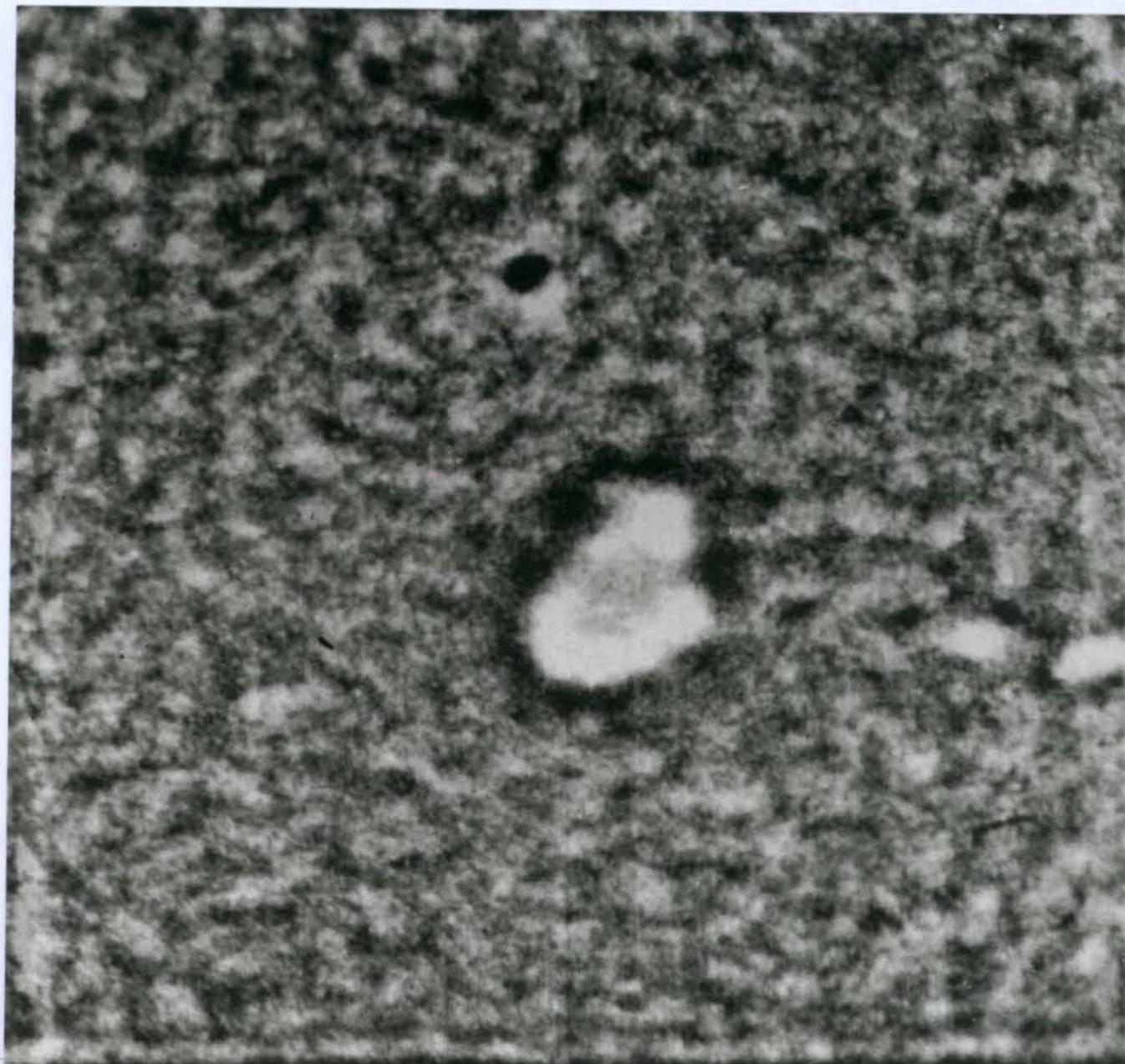


FIG A6 P65 GSW No7.





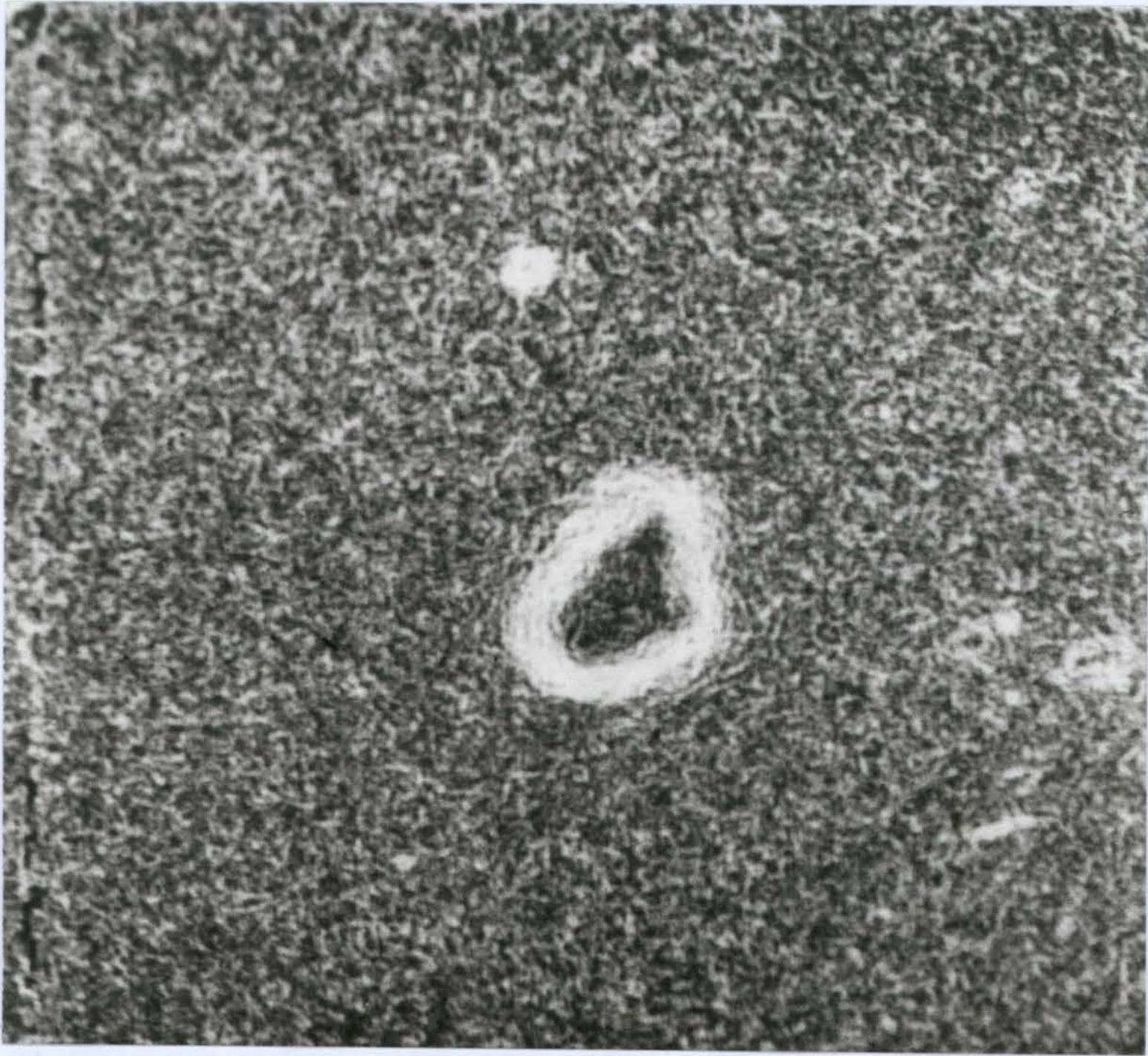
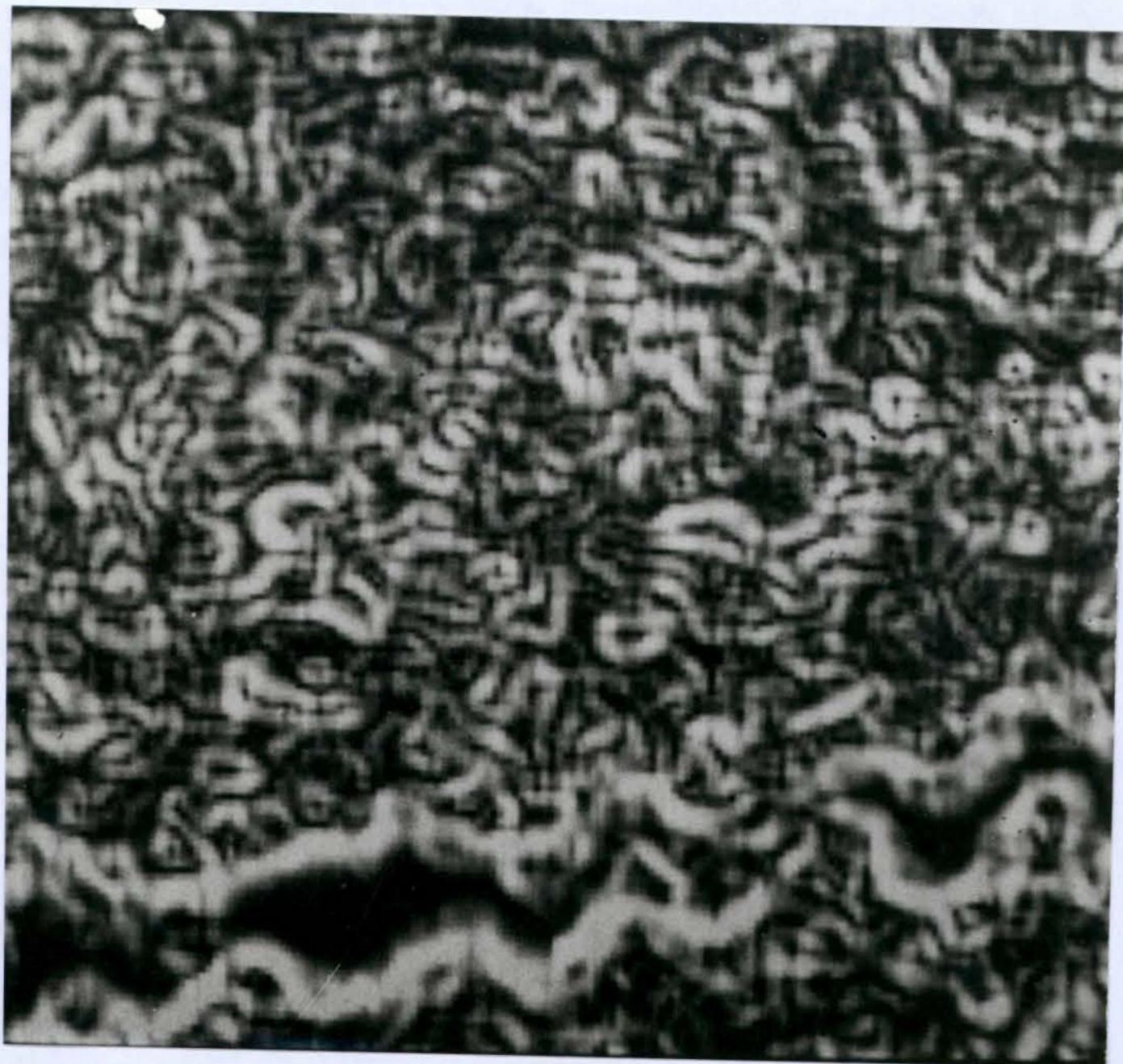


FIG A8 P66 GSW No8.



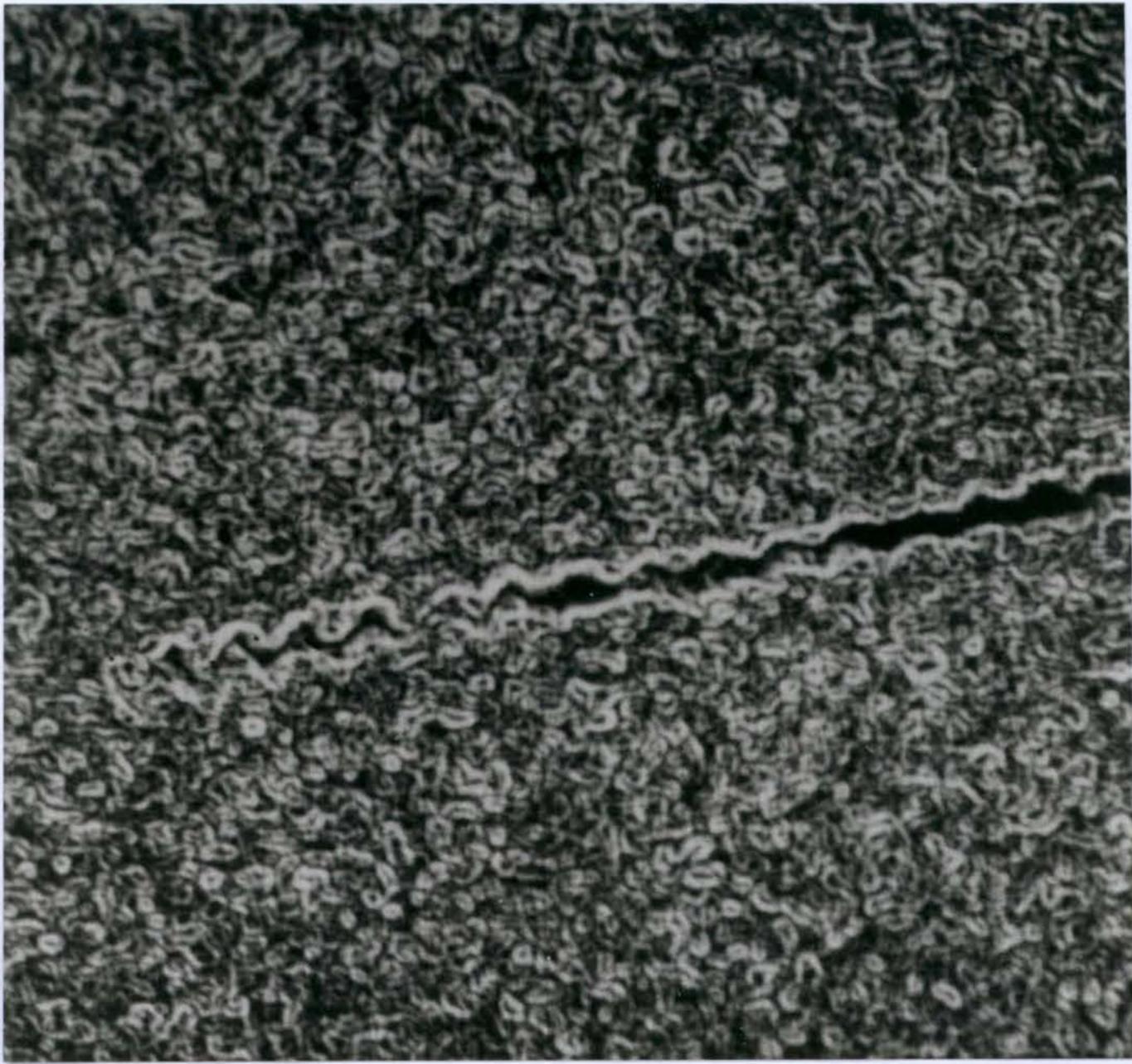


FIG A8 P66 GSW No8.

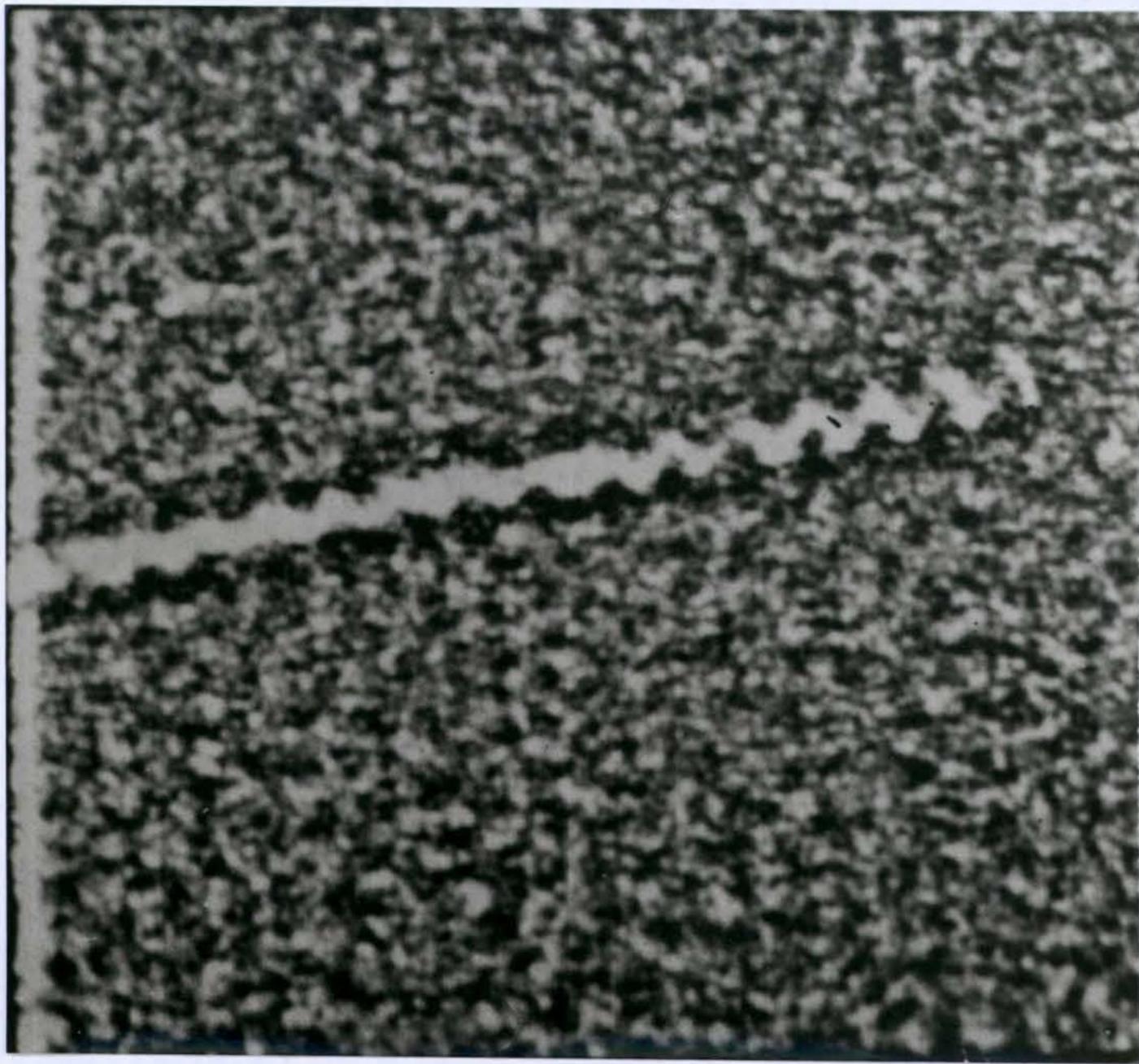
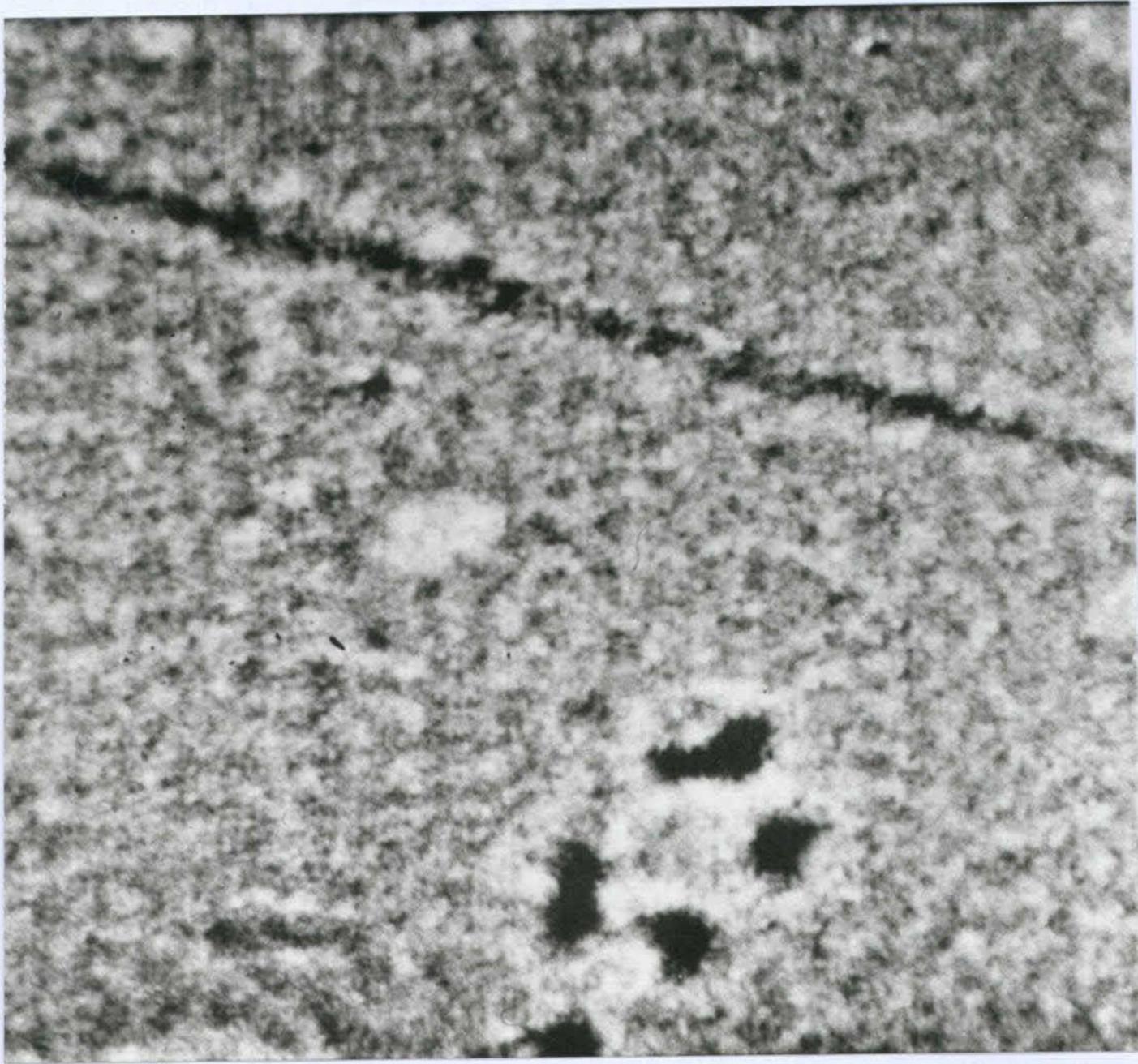




FIG A8 P66 GSW No.8





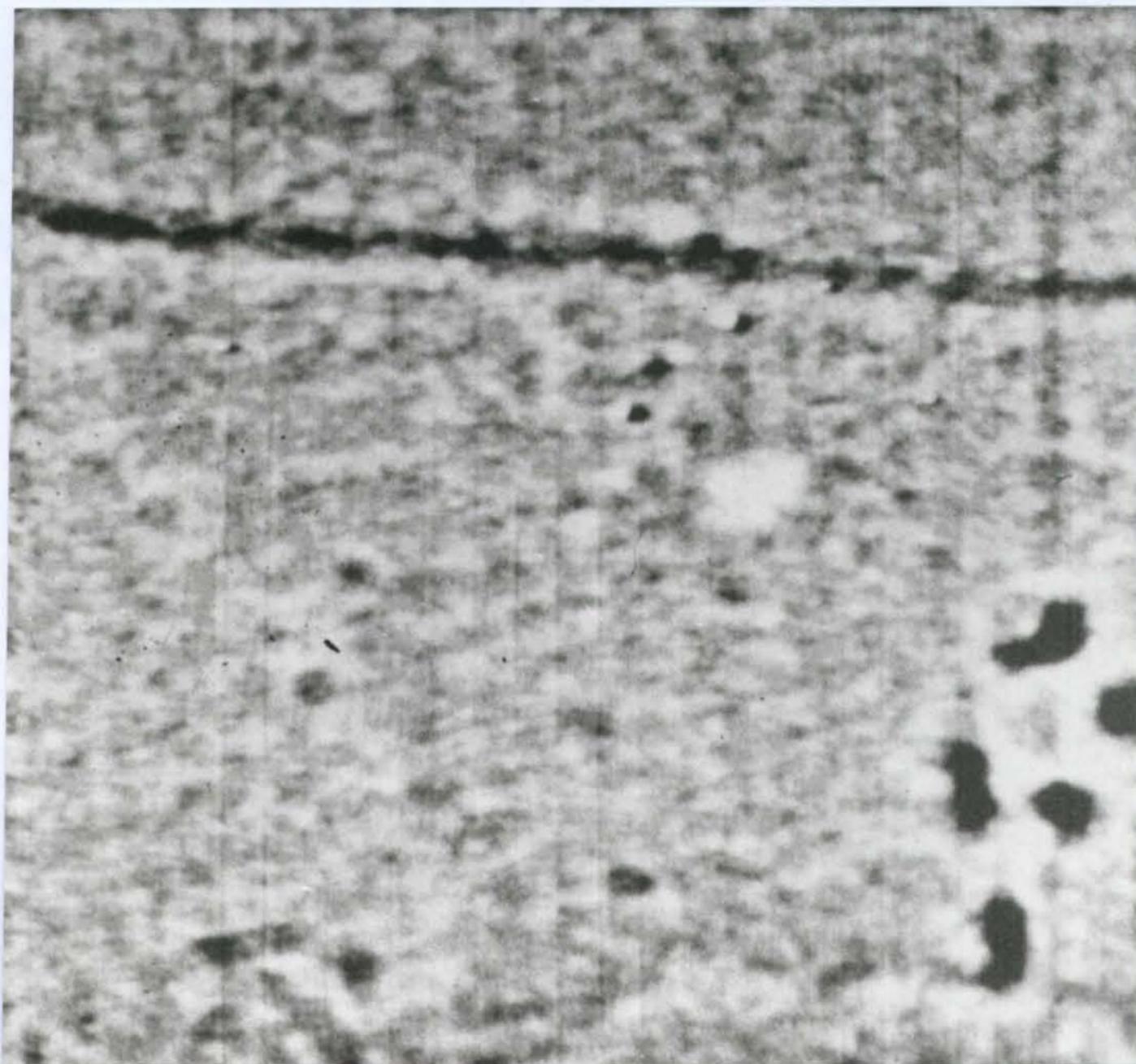
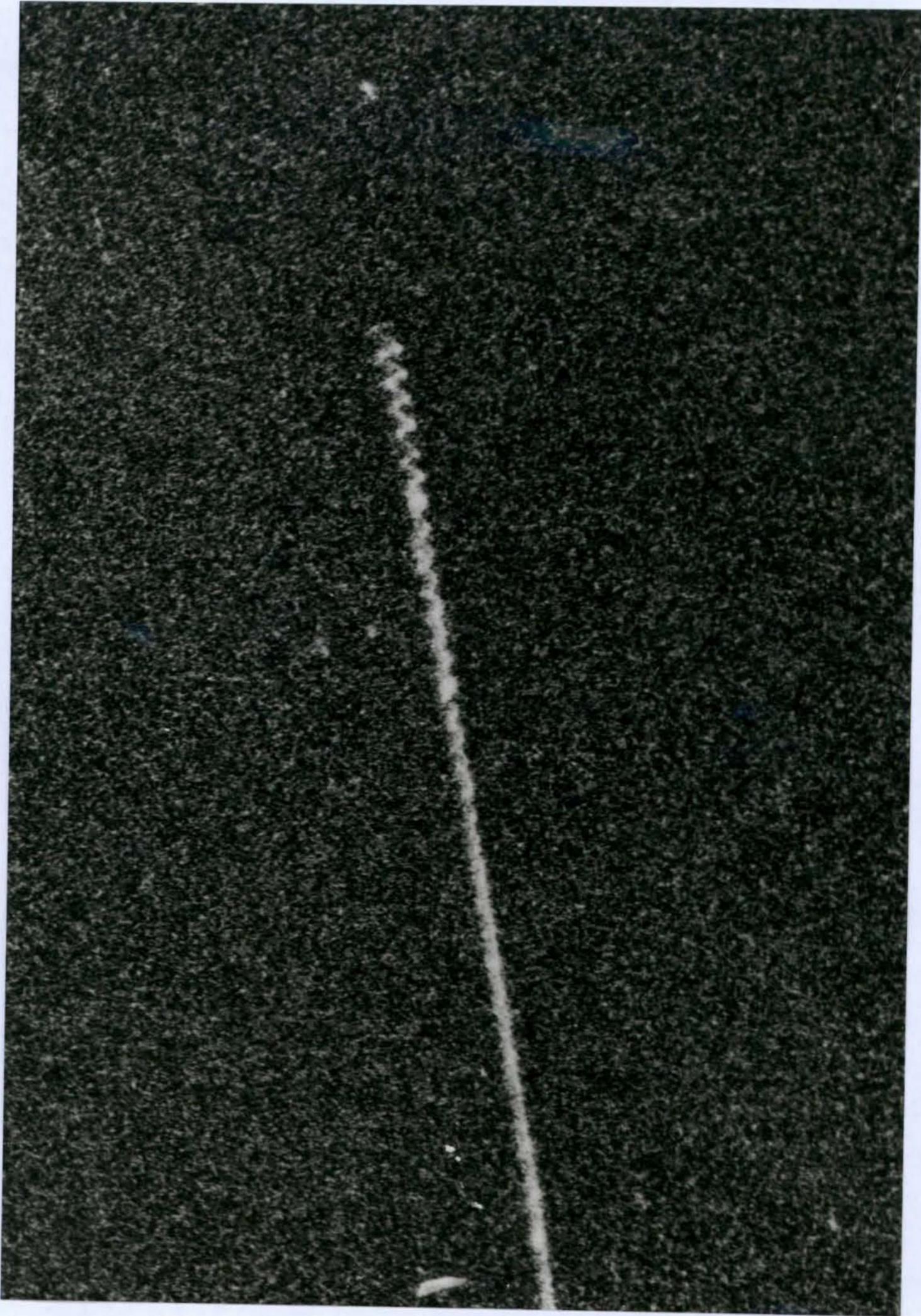


FIG A8 P66 GSW  
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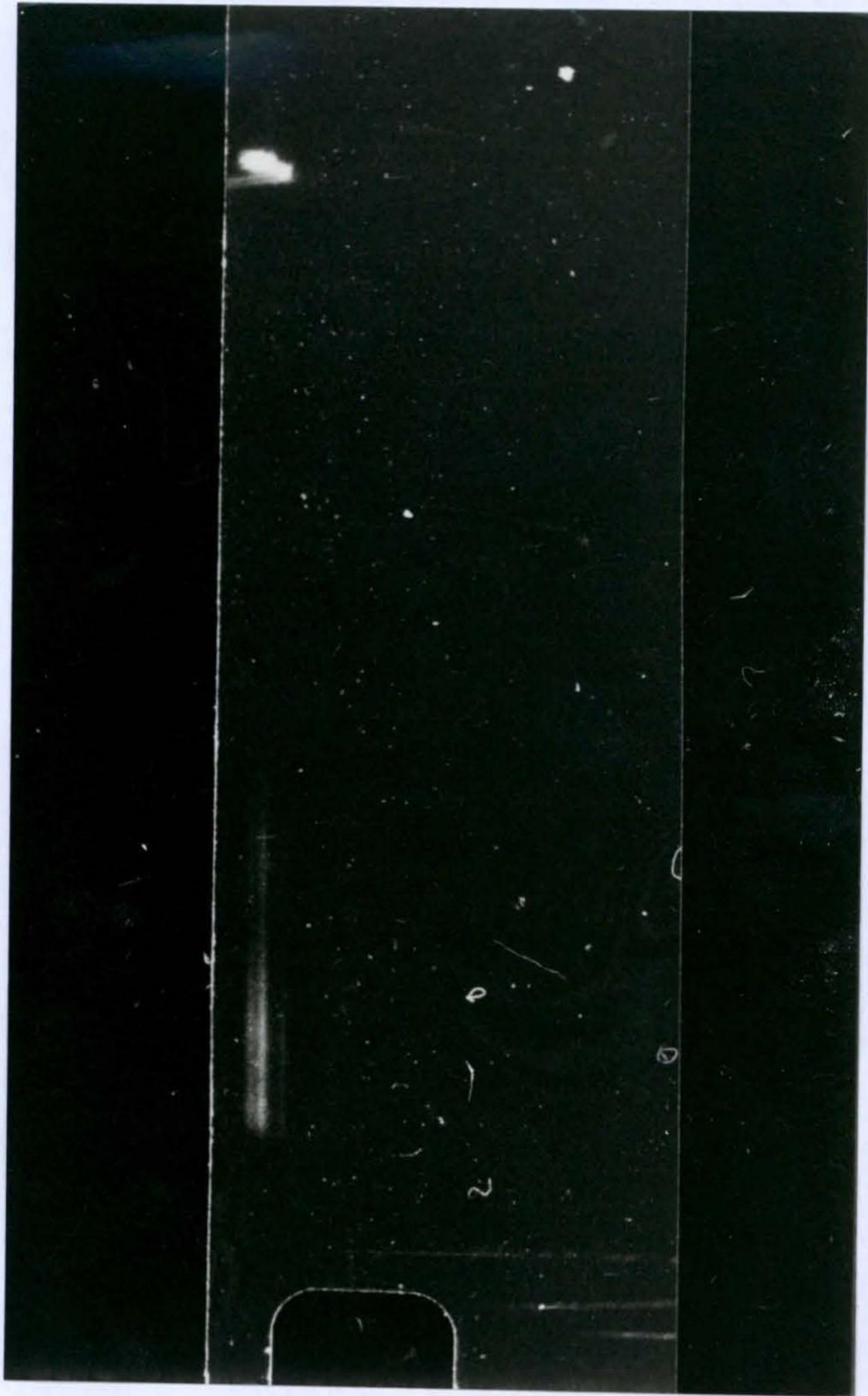
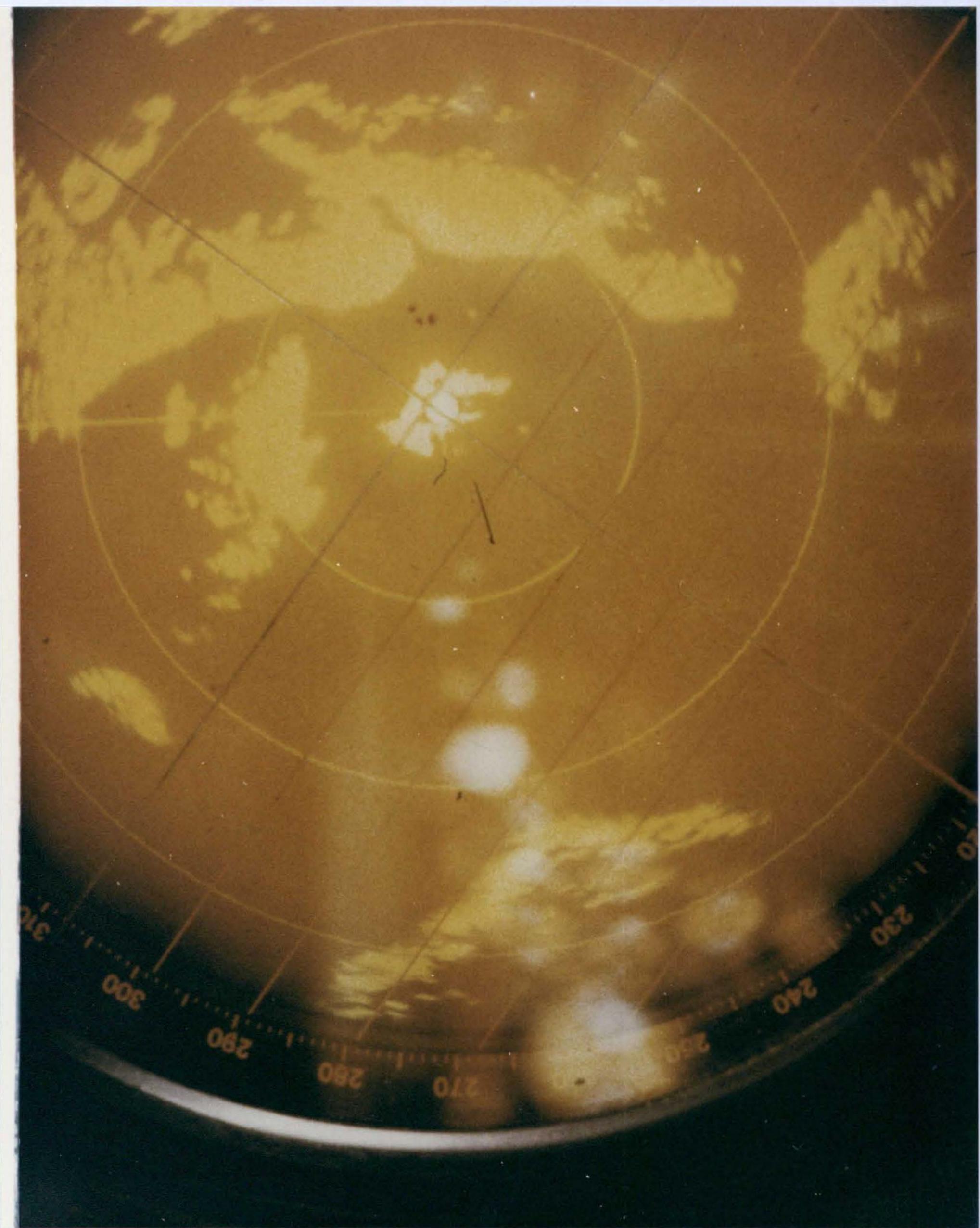


FIG A9 , A10 . P67 RADARCASE



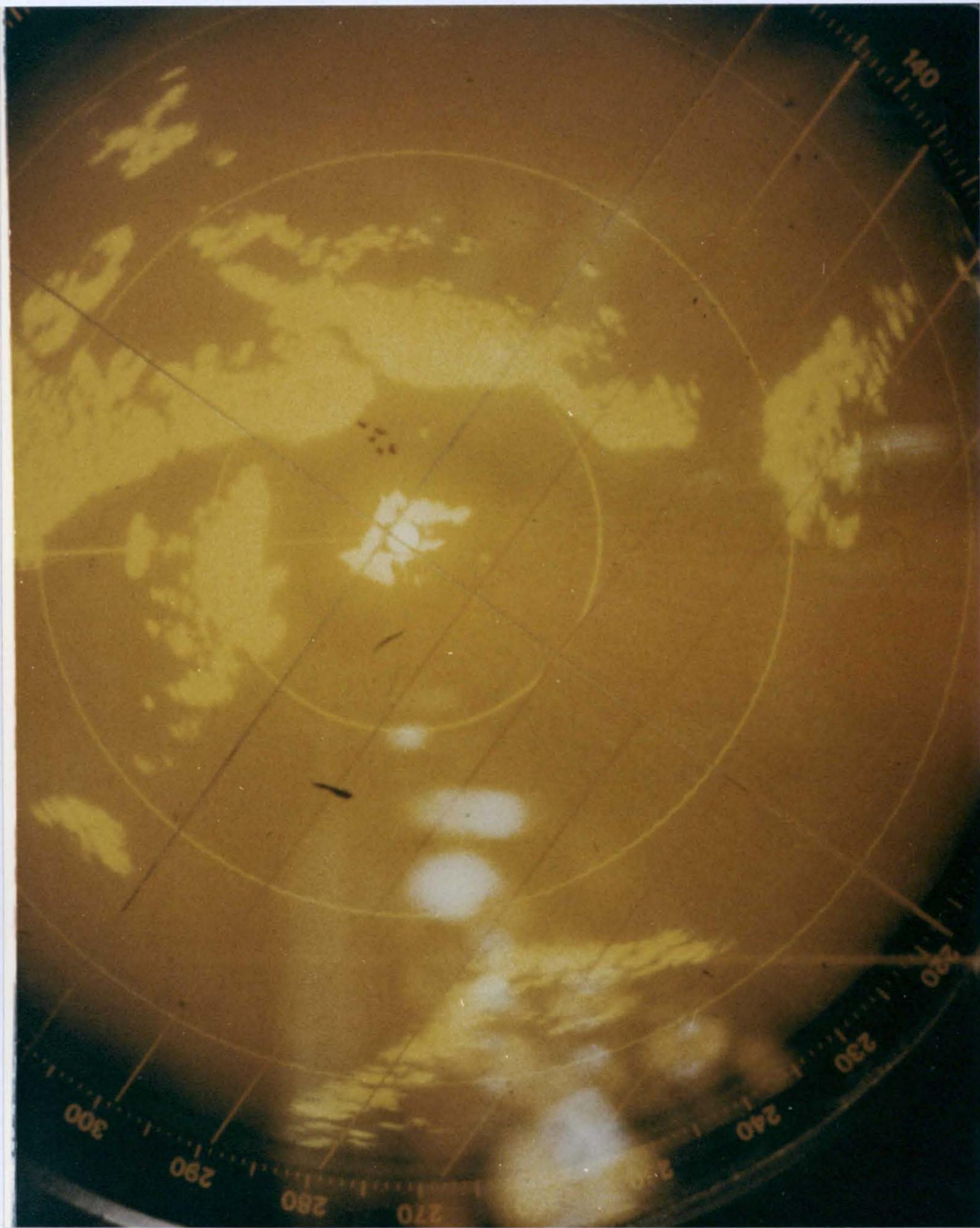
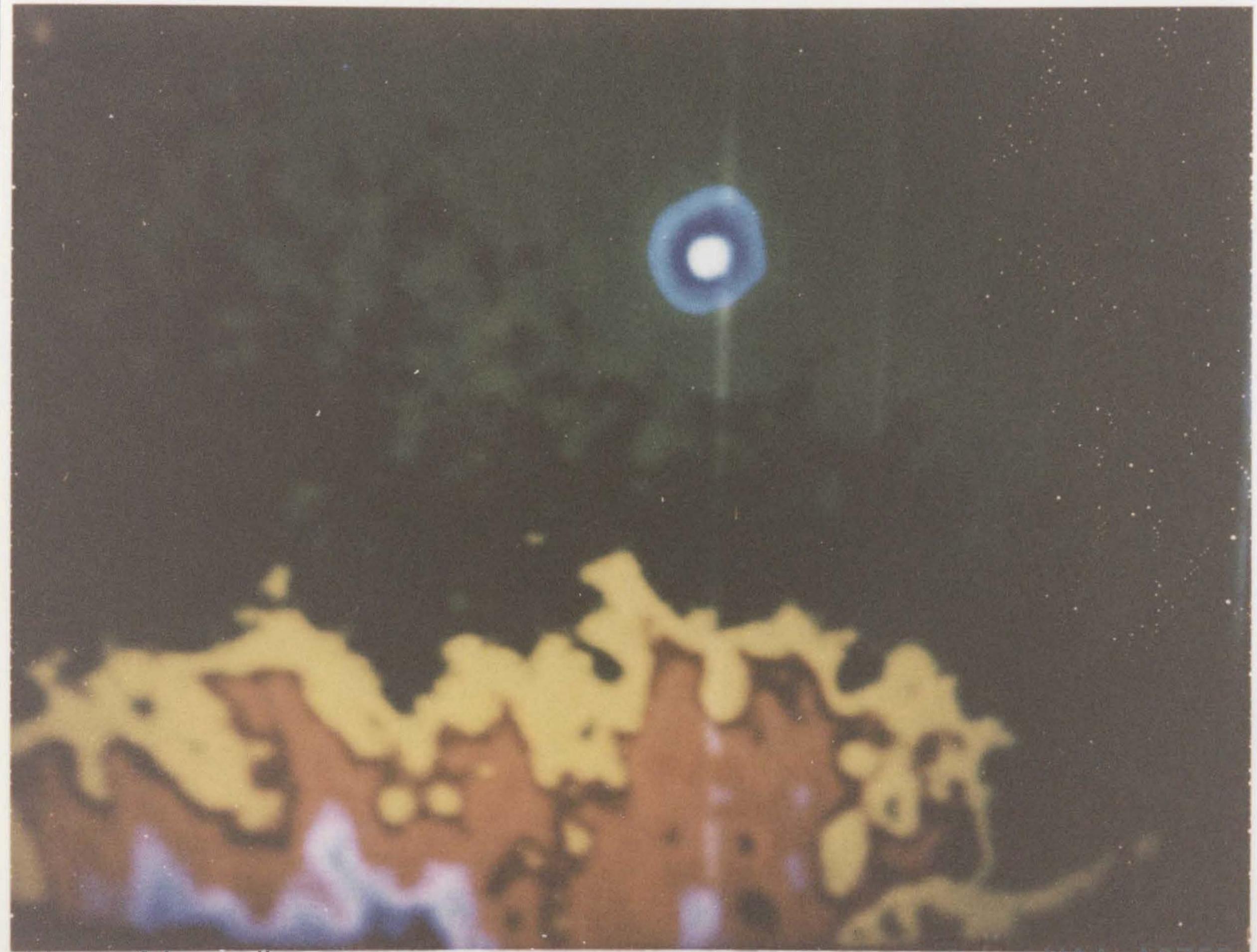


Fig A9, A10 RADAR CASE

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GSW

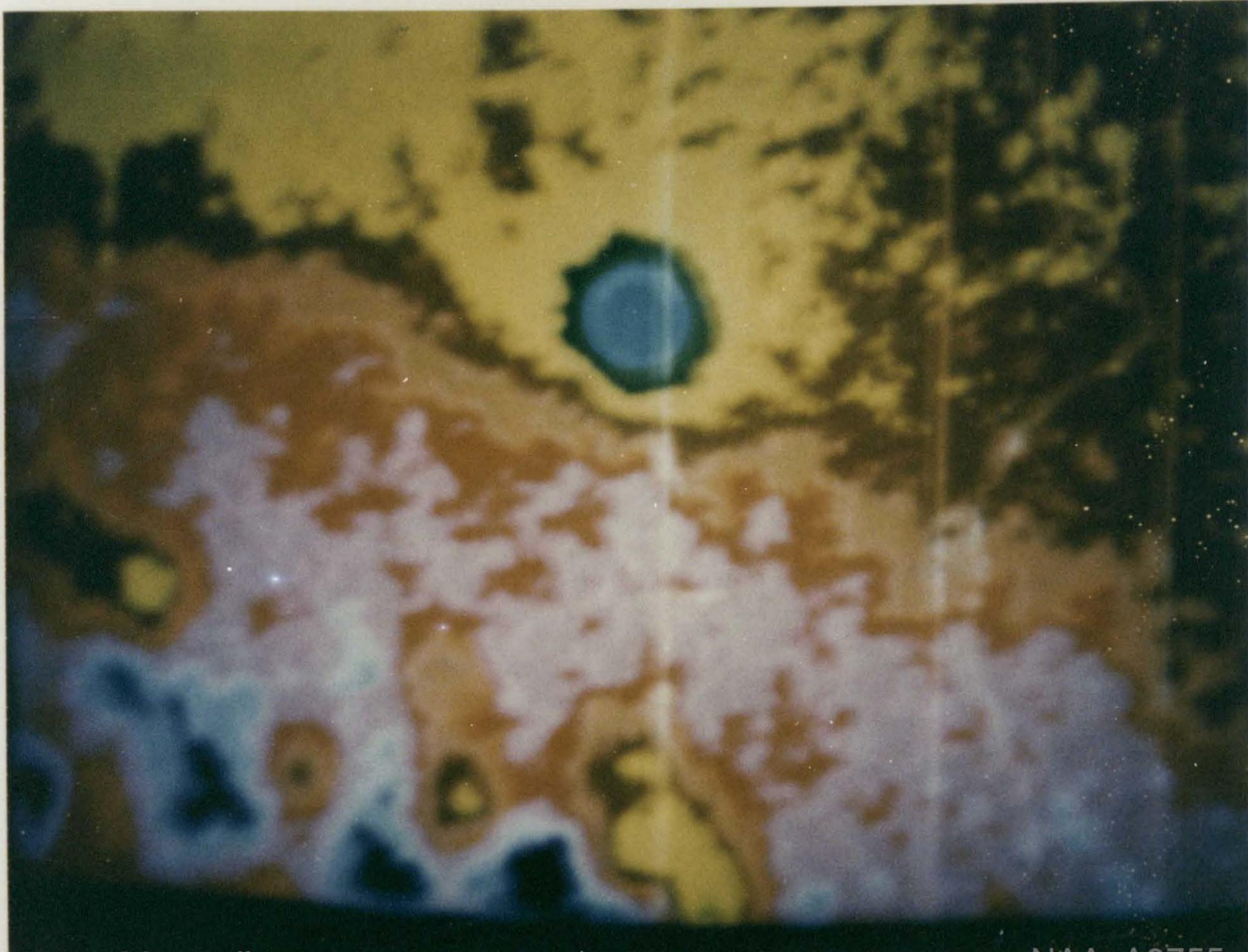
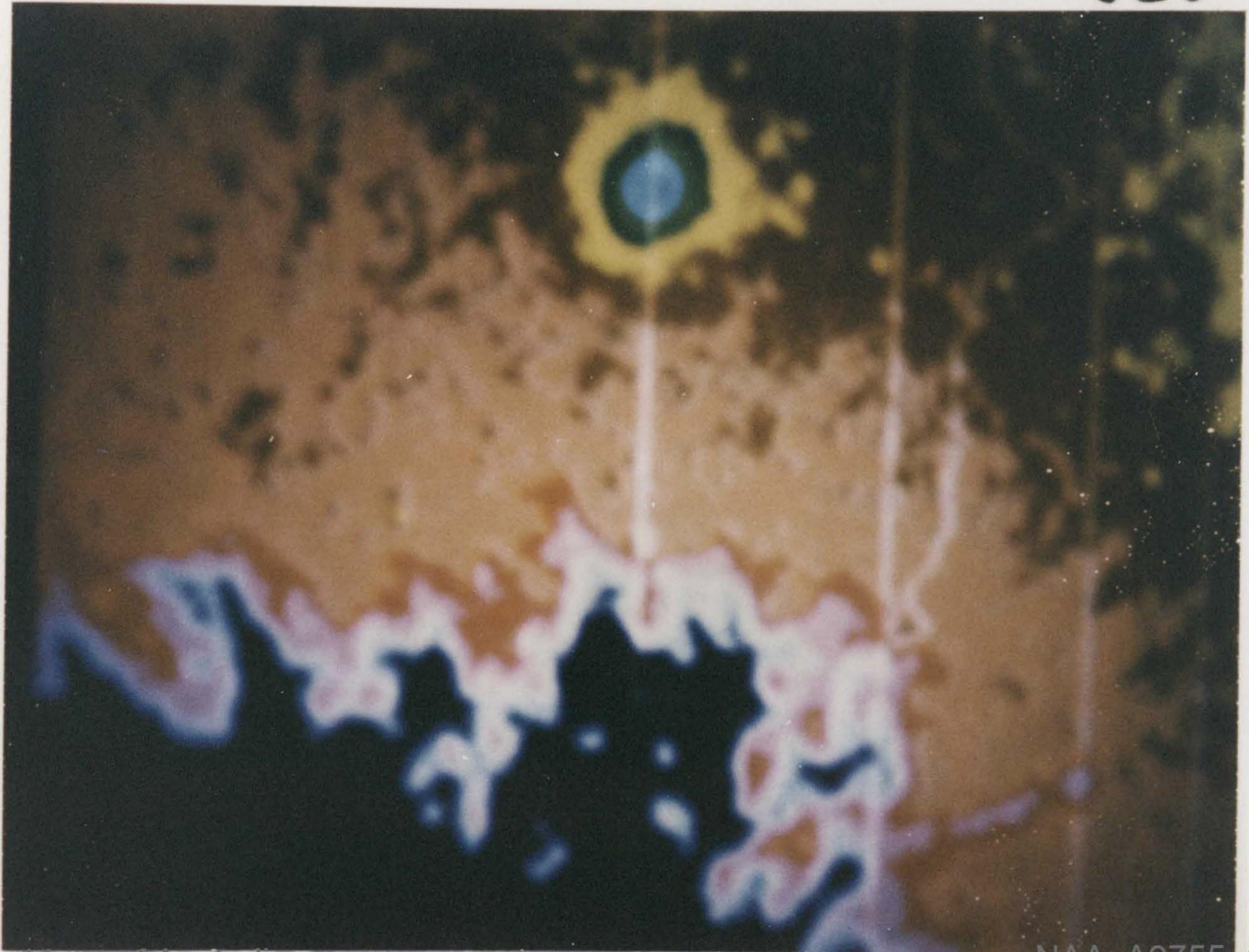


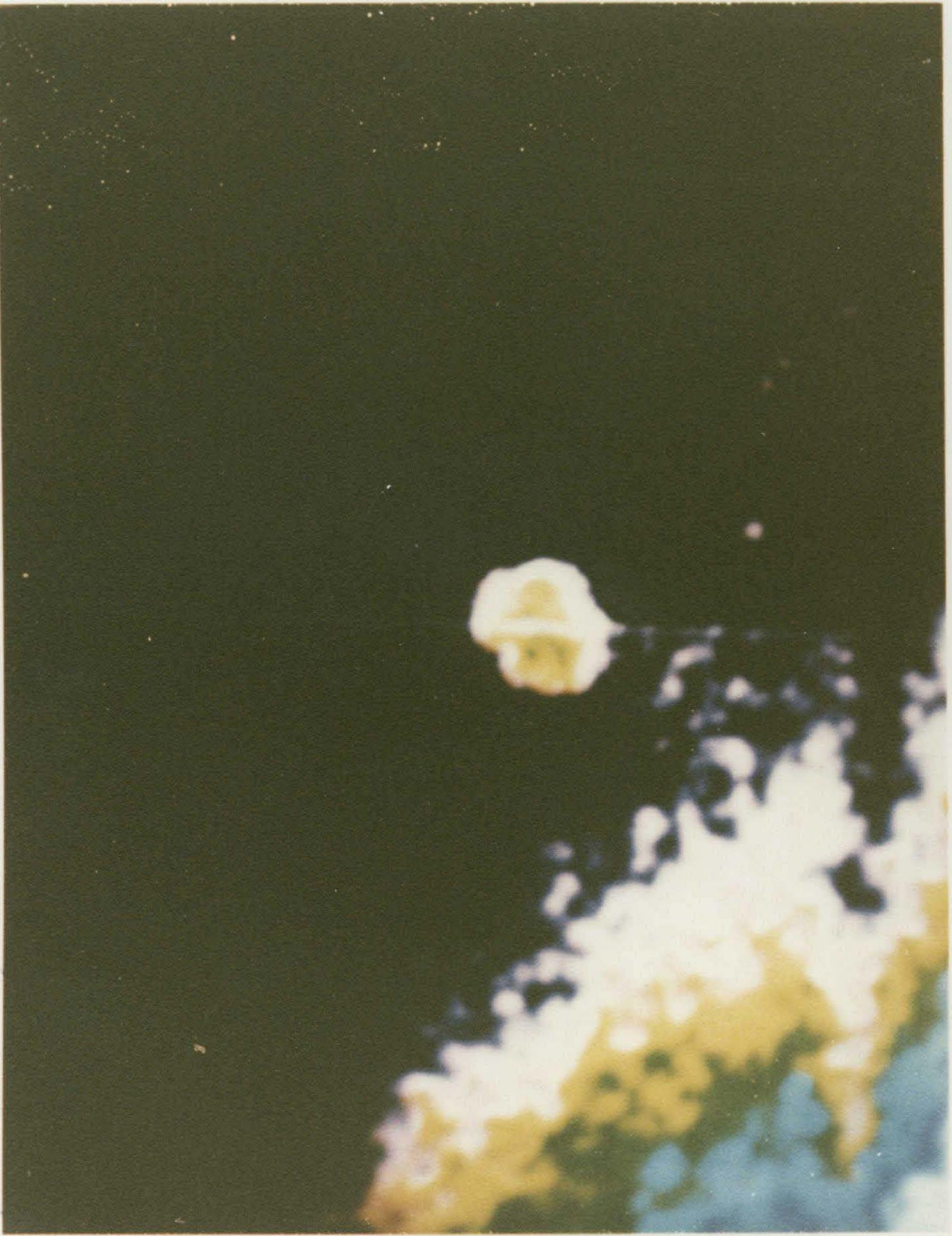
Fig A9, A10 Page 67 RADAR  
CASE

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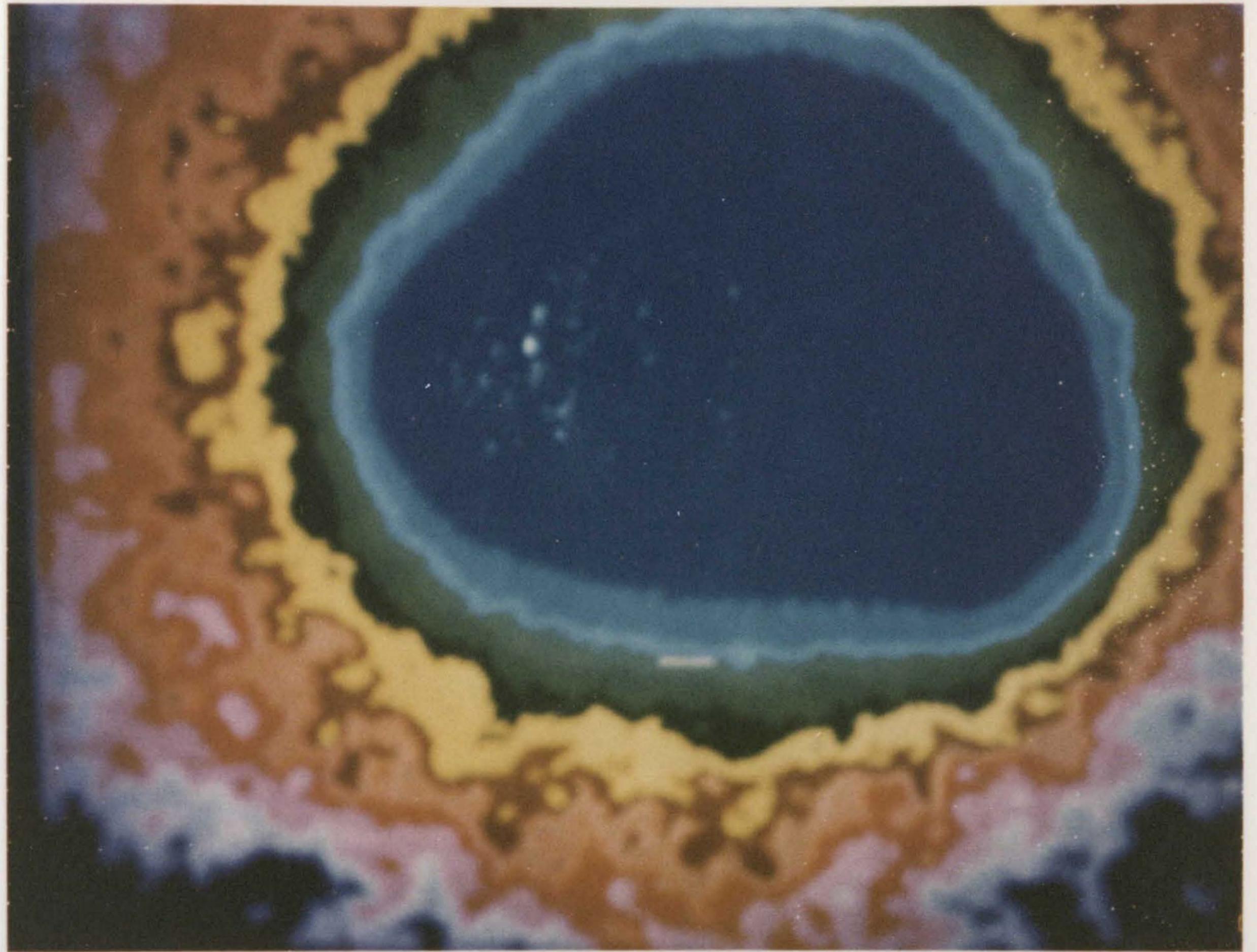
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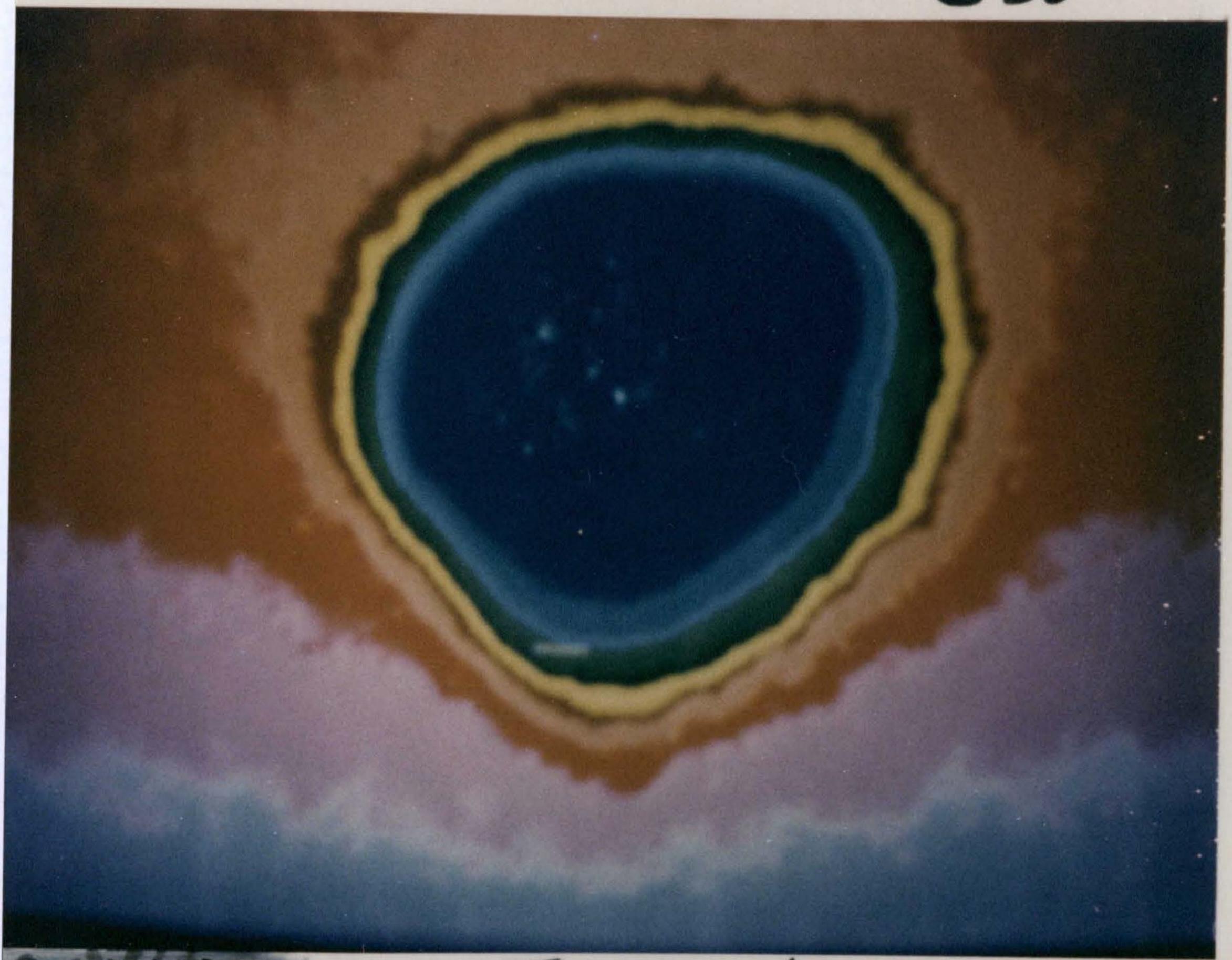
DEANSITY SLICE

FIG A9, A10 Page 67  
RADAR CASE

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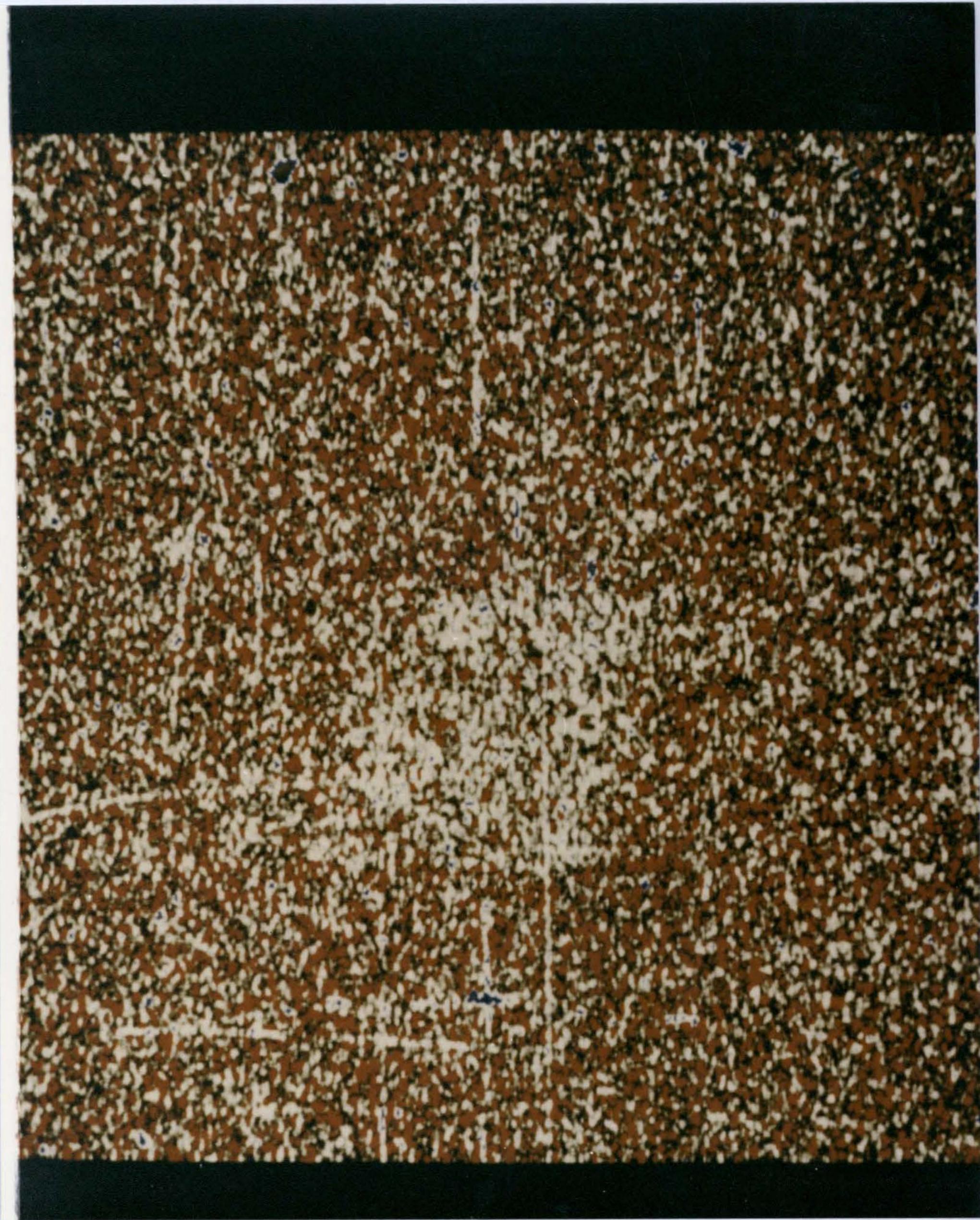


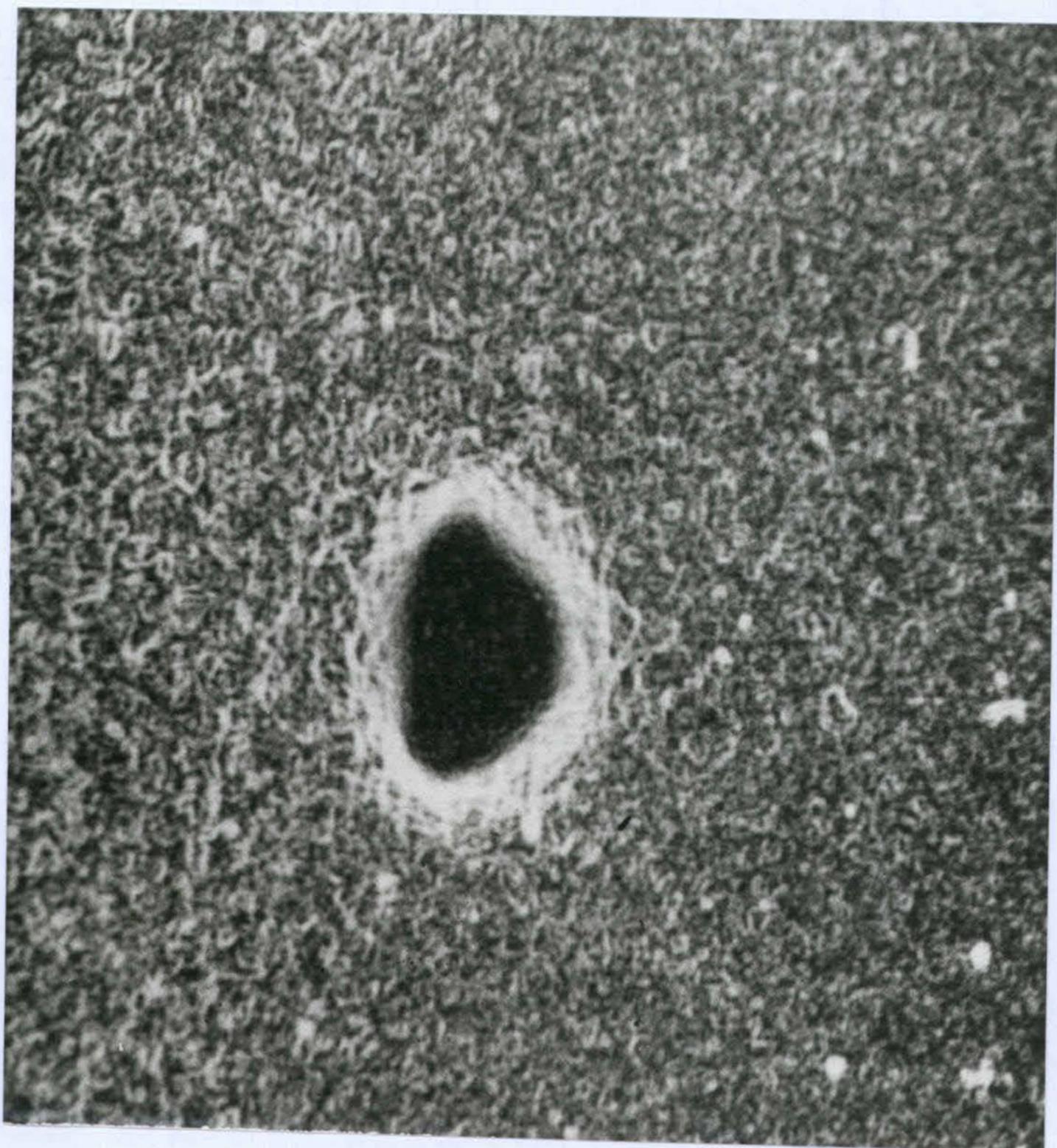
COLOR CONTOURING

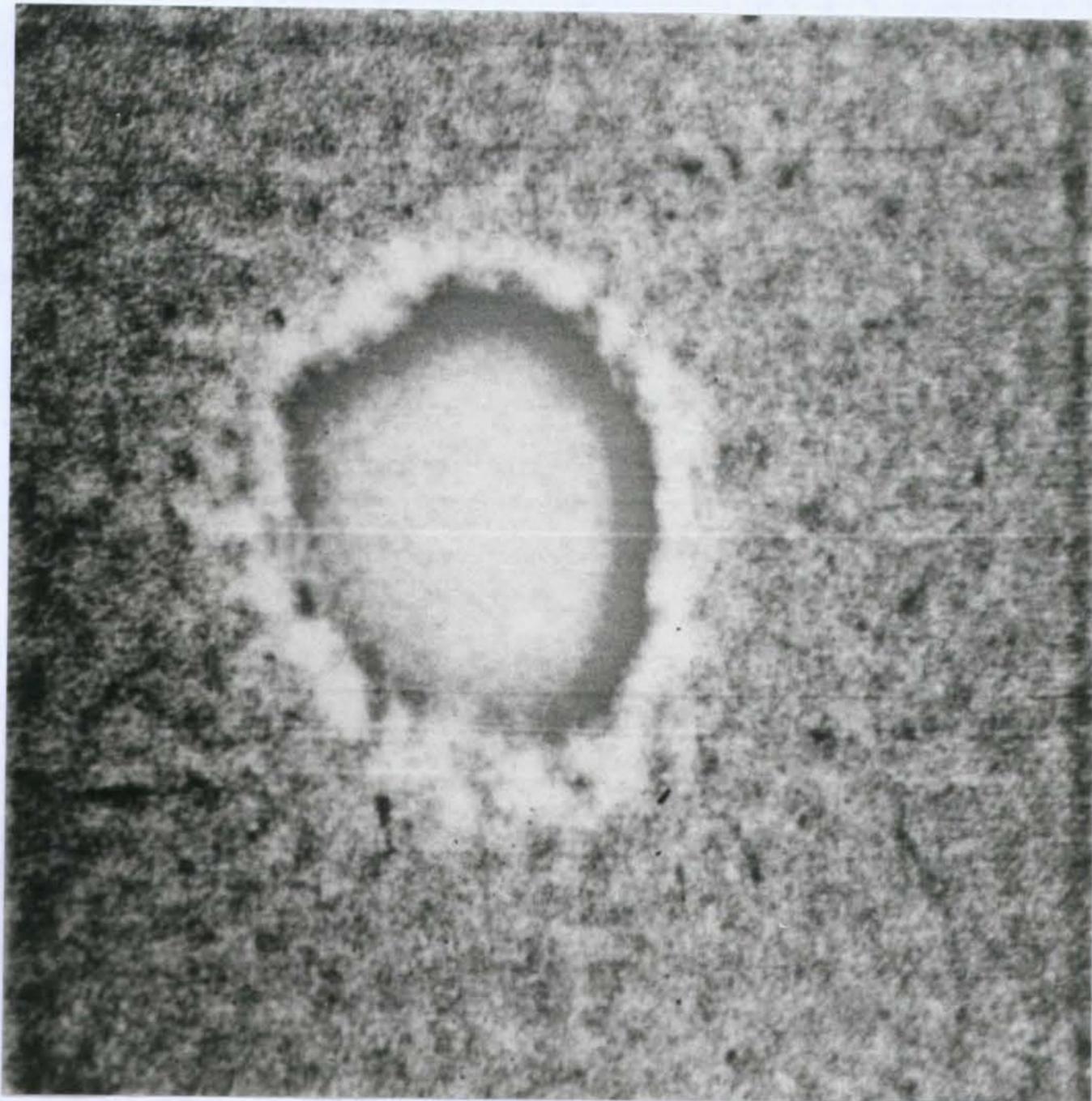
FIG A2 P64

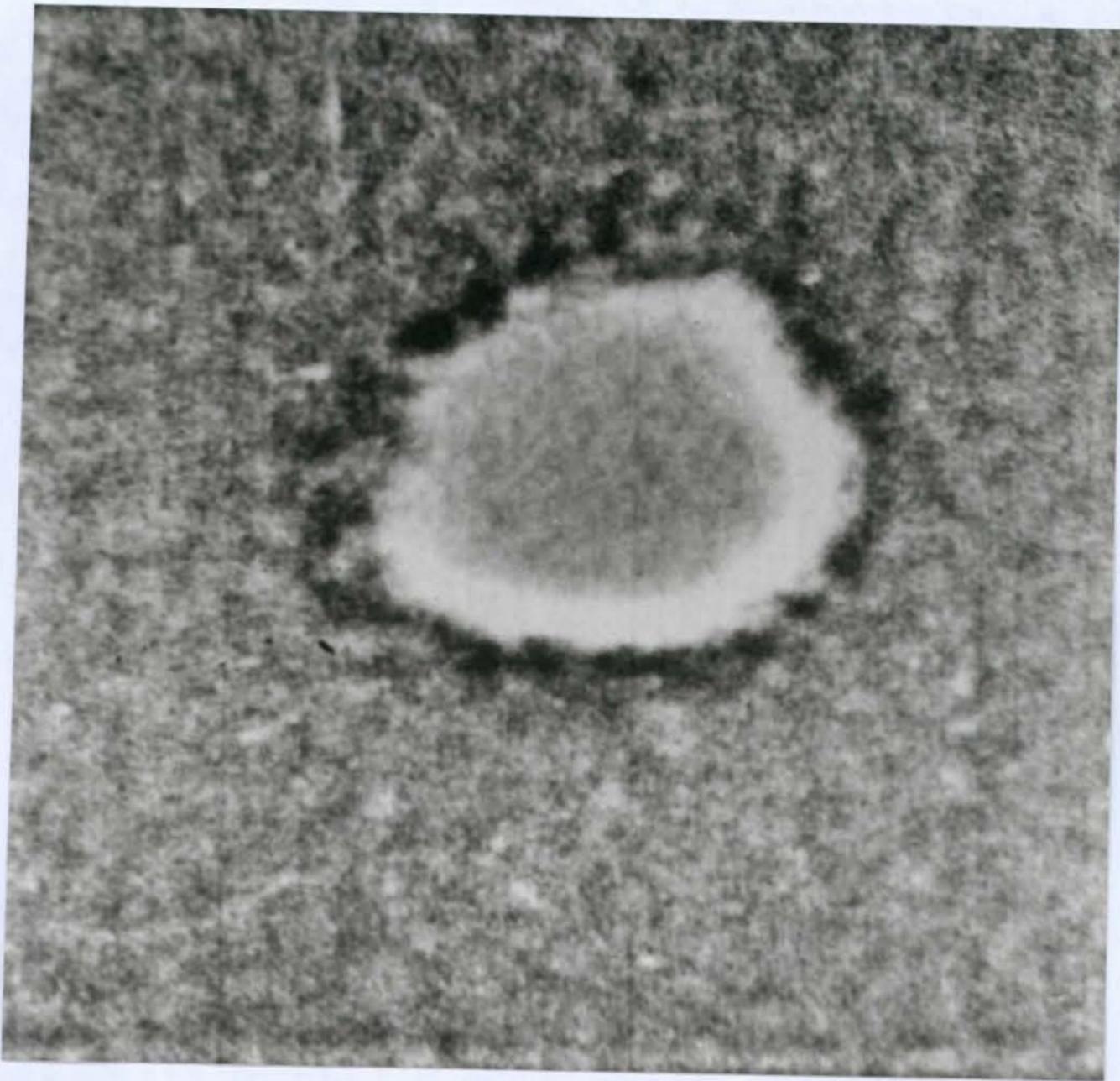


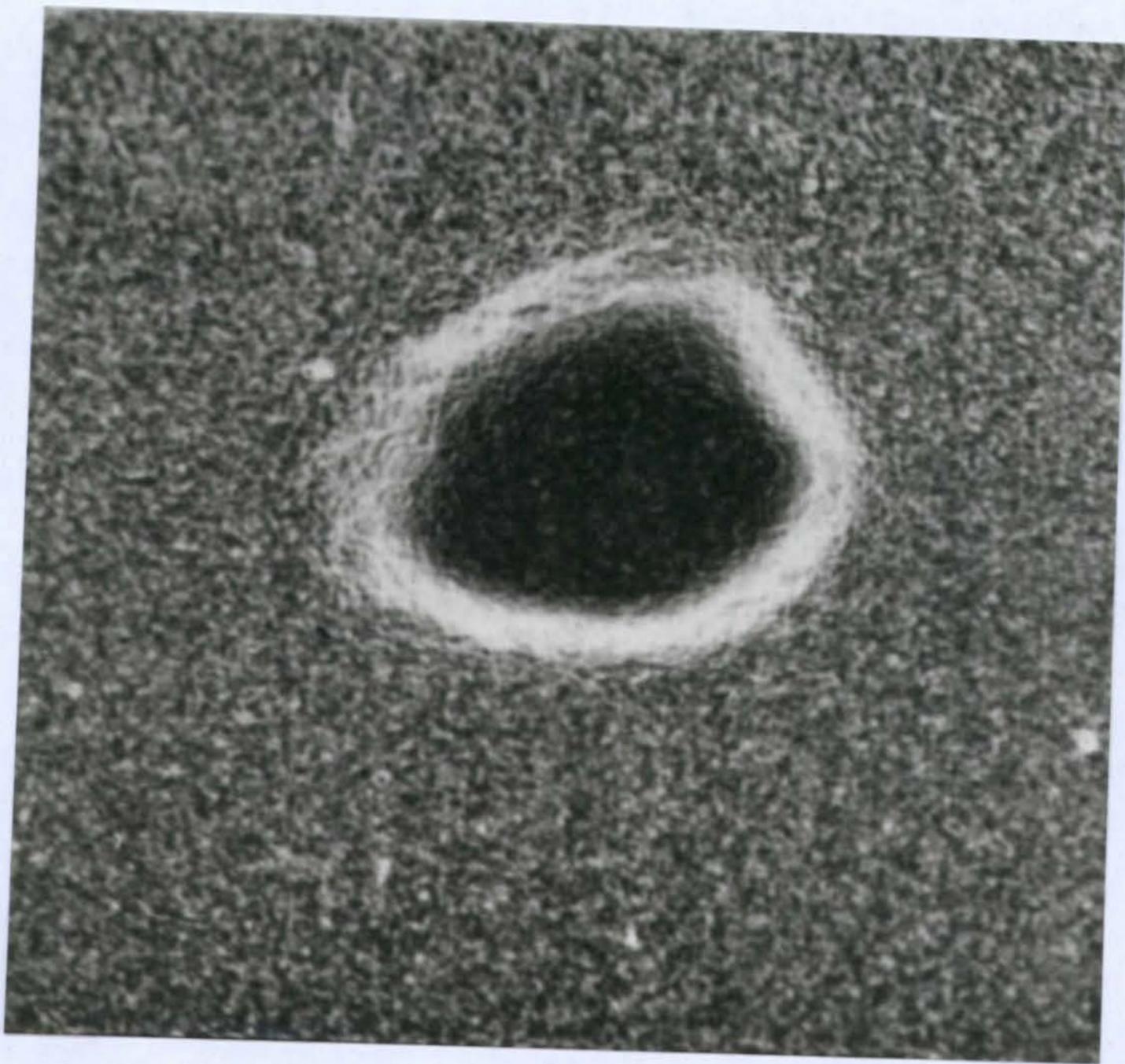
Fig A22 B73017







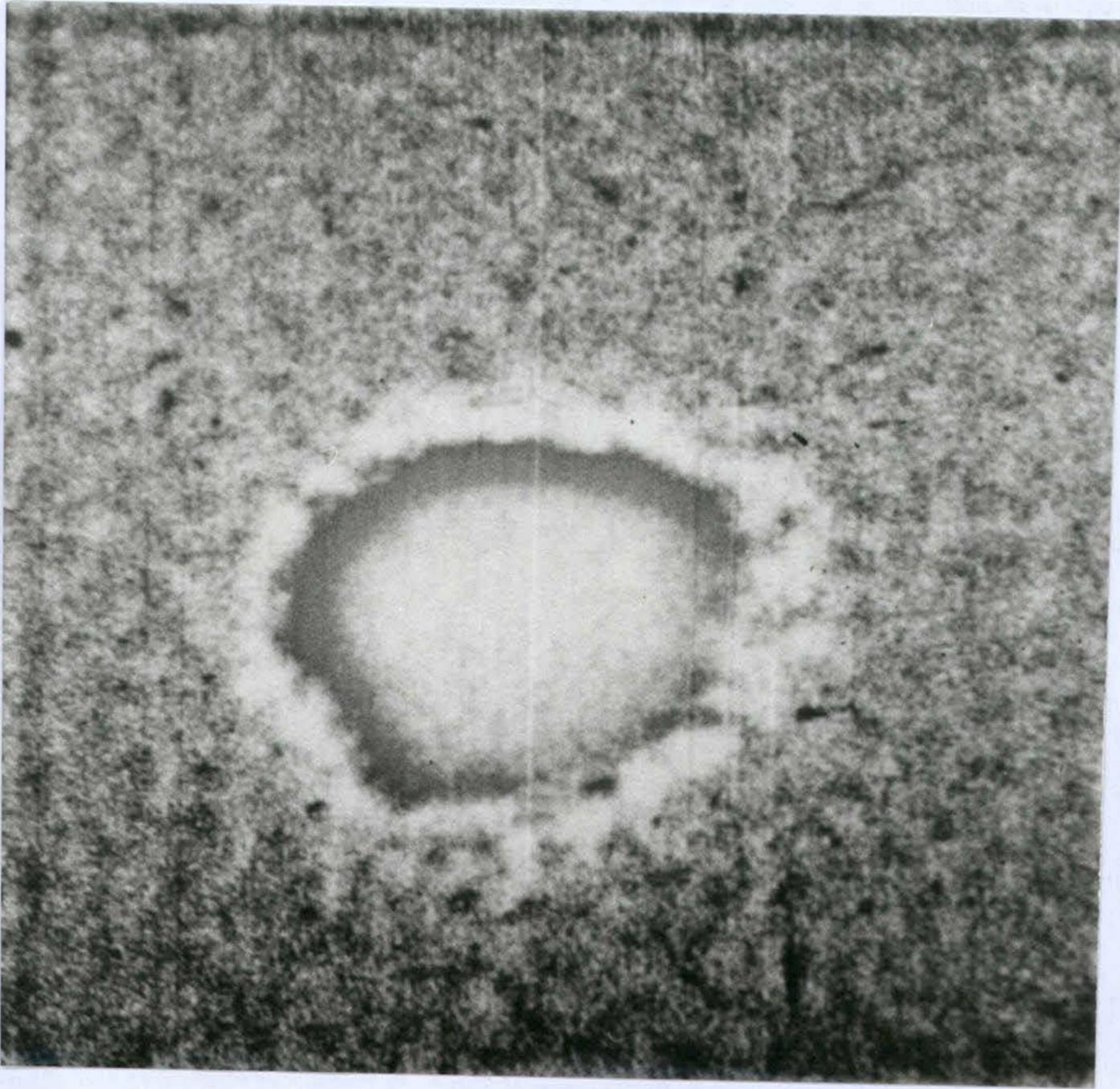


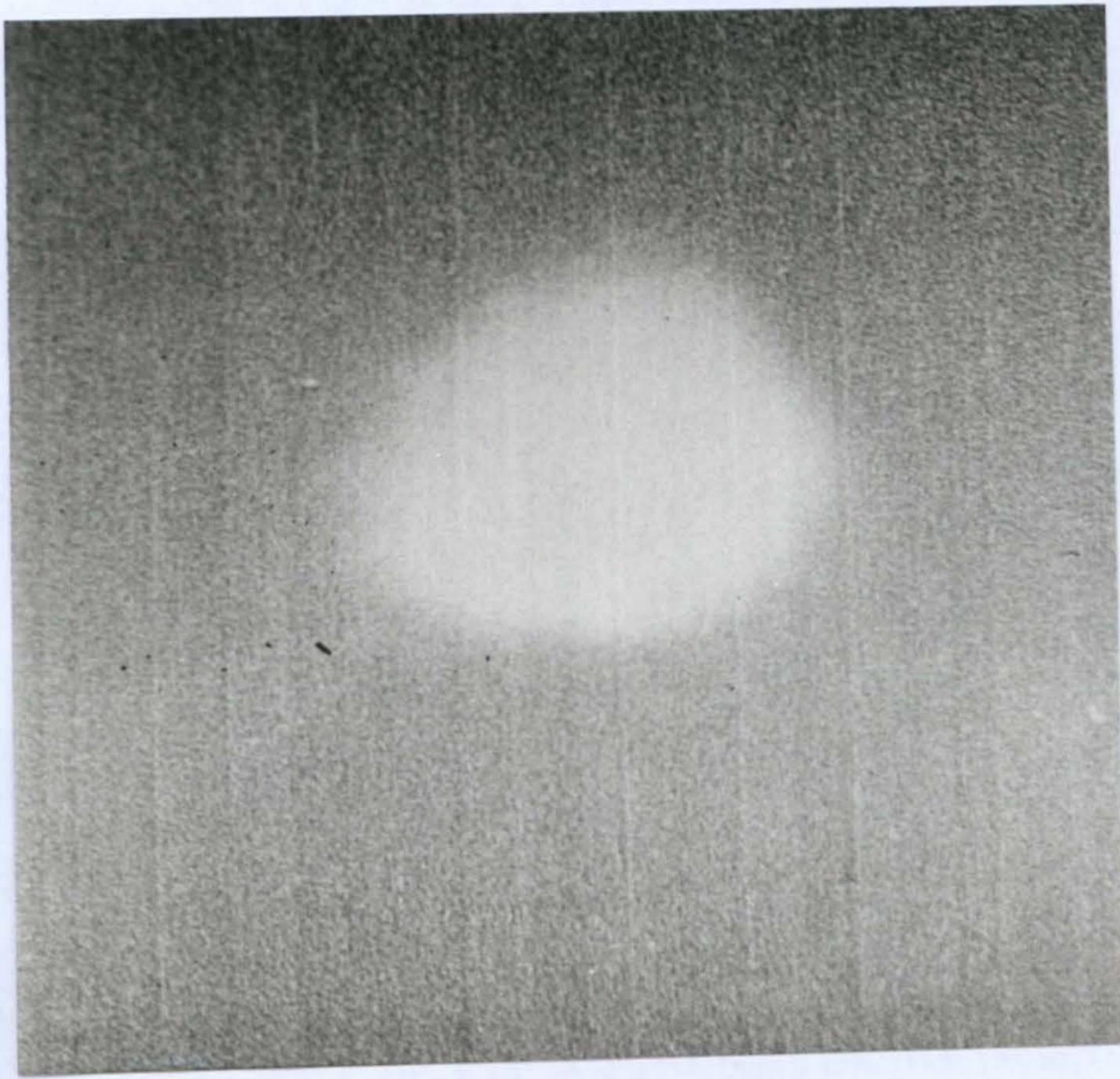














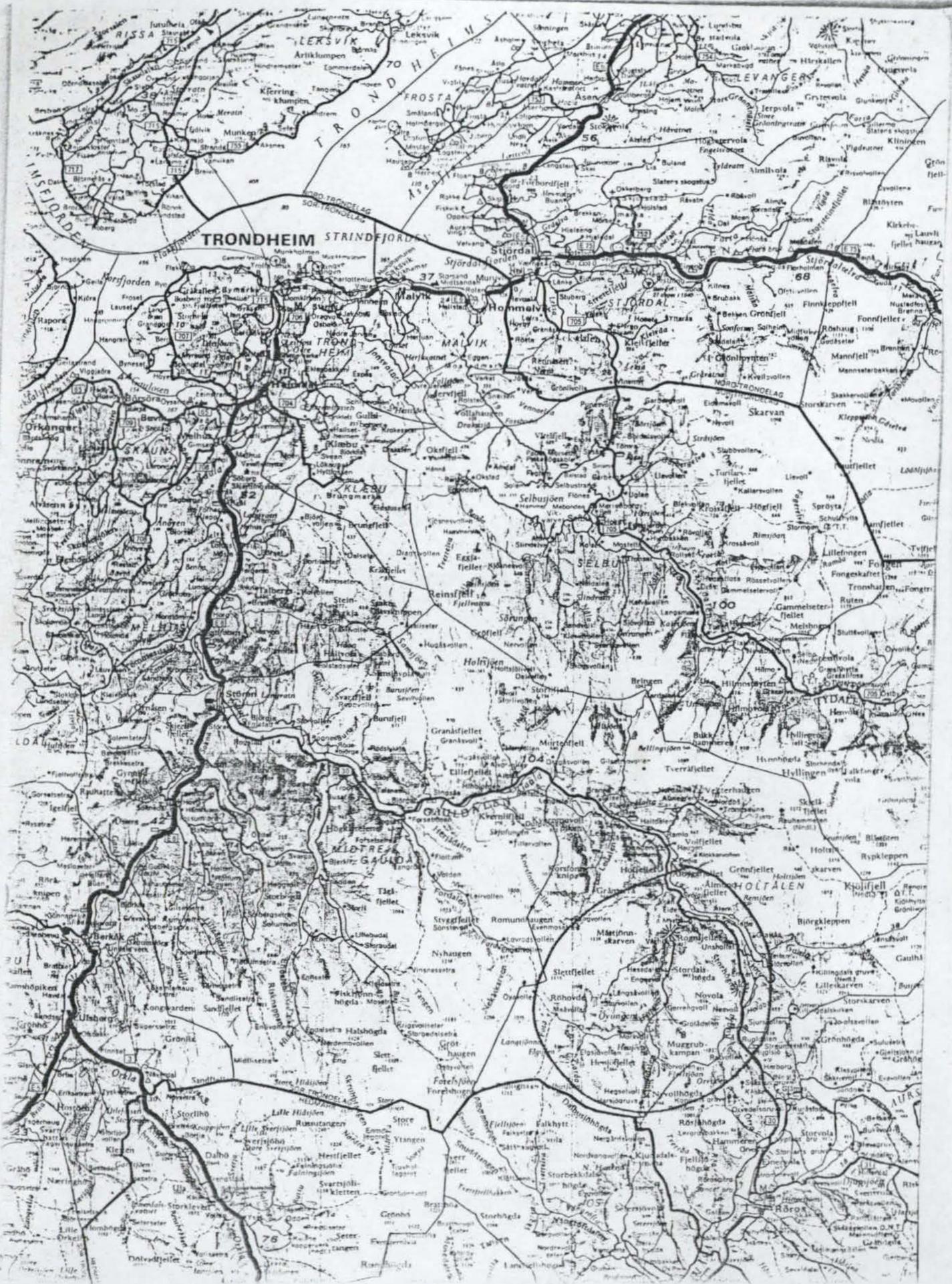
# PROJECT HESSDALEN 1984

FINAL TECHNICAL REPORT  
PART ONE

by siv. ing. Erling Strand

© «PROJECT HESSDALEN»

NAA: A9755, 1



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## FOREWORD.

The report first give an introduction to the project. Telling about the history of the lights and the running of the project. Then it list all the instruments, and the argument for using these instruments. Then it present the results. All the details about the measured data is in the appendix. The fourth chapter discuss what we learned during the project part 1, and what we should have done different. At last, there is a conclusion.

## I. INTRODUCTION.

Hessdalen is a valley in the middle part of Norway, south-east of Trondheim, about 30 km north-west of the town Røros. The valley is about 12 km long, and about 150 people lives there.

In december 1981, unknown lights suddenly started to show up. The lights could stand still for more than an hour, they could move around slowly, and sometimes they could stop. They could also show a large speed: At one time a speed of about 8500 m/s was tracked by radar.

These lights could be anywhere. Sometimes they were reported to be just above the roof of the houses, or just above the ground. Sometimes they could be high up in the air. Mostly the lights were reported to be below the tops of the mountains nearby. No one could give explanations for these lights.

The lights appered to have different specific forms. This showed up on the photos. It could have a form of a bullet, with the sharp end down. It could be round as a football. It could be as a "Christmas-tree" upside down. The colours were mostly white, or yellow-white. Sometimes it could have a small red light, usually on the top or bottom of the white. A few times it seemed to have all the coloures; red, green, blue, yellow, at the same time. And sometimes, on the photos, we can see a blue light.

The lights were occuring several times a day, but mostly during the evening or nighttime. At the most, it could be seen about four times a day. All of these were actually in the valley. If we had counted those lights that showed up higher in the sky also, it could have been a higher number. There were more lights in wintertime. In summertime, lights were seldom seen at all. One reason for that might be that there is daylight almost whole night in summertime in Hessdalen.

The lights could be split in three groups:

- 1. Small and strong white or blue flashes, which could show up everywhere in the sky.
- 2. Yellow or yellow-white lights. These lights have very often been seen in the valley, just over the roof of the houses, or even down on the ground. They could be stationary for more than an hour, move slowly around in the valley, and sometimes show large accelerations and speeds. They could also be higher up in the sky. Mostly they moved on a north/south course.
- 3. Several lights together with a fixed distance from each other. Mostly it was two yellow or white lights with a red in front. Many people talked about "The object", when they saw this type of light. These lights could move slowly around the top of the mountains. The direction of "travelling" was mostly on a north/south course.

Suddenly, in the spring of 1983, the lights seem to be much more seldom. In the summer of 1983 we got no reports. However, in the autumn and winter reports started coming in again, but much fewer than the years before. However, in this autumn (1984), we have got more reports than last autumn.

As no official institutes with governmental support seem to care about these unknown lights, five persons startet their own project. The aim of the project was to find out what this phenomenon in Hessdalen and nearby areas was. Even if we didn't succeed in that, we hoped to find out a little bit more about the phenomenon than what we knew before. This is the report on part 1 of this project. If founding is available, we will go on for another year.

The project consists of a "working committee", which has the responsibility for running the project, and an "advisory committee", which should help the working committee in the in the theoretical part. It should act as an expert group and answer questions from us; the working committee. (The fact is that the advisory committe got very little work from us, because we managed to build up a local expert group, consisting of people from Norwegian Defence Research Establishment (NDRE), The University of Oslo and The University of Bergen. In these days, the University of Trondheim also join the group.)

The project was born 3. June 1983. On the 27. of August it was presented on BUFORA's 3.rd. international UFO-congress in England. During the autumn a research program was established. The 19. of November the project was presented to the people in the valley. During the first part of January 1984, an information bulletin, explaining about the project, together with a simple report form, which people should return to us, were sent out to 3300 households in the district. The work in the field, with all the instruments, started the 21. of January 1984, and ended the 26. of February.

The work in the field started with a "test weekend". This weekend should be a training session for the main part, which should go on from the 11. of February to the 26. of February. During the test weekend about 22 persons were present. Some of these people could be on duty between the test weekend and the main part. Therefore, we decided that the project should go on, all the time from the 21. of January to the 26. of February. During the time between the test weekend and the main part there were few observers present. From monday the 23. of January to Friday the 27., there were 5 people. After that, only one or two people were on duty. That is perhaps the main reason why there are few reports during that periode. In the main part, from the 10. of February to the 27. of February, the number of observers was as shown in fig. 1.1.

PERSONELL DURING THE SECOND PART.

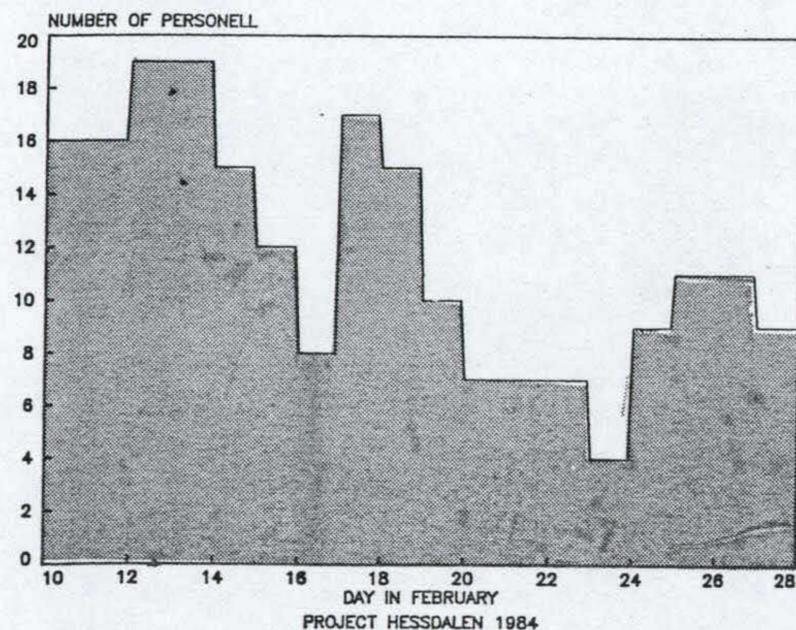


Fig.1.1 - The number of observers during the main periode.

The people in the field were divided in three groups during the test weekend. Some on the headquarter on Aspåskjølen, some on Finnsåhøgda, and some on Fjellbekkhøgda. For a short period, some people were at Heggset too.

During the main period, from 11. of february to 26. of february, people were divided in three groups, but now the field-stations were at Hersjøen and Litlfjellet. The headquarter was still at Aspåskjølen. The headquarter was a caravan, with most of the instruments in it.

Some of the photos that were taken of the Hessdals phenomenon prior to the project period, are in the appendix.

- Acknowledgements.-

I wish to express our thanks to :

Norwegian Defence Research Establishment (NDRE), especially Dr. E.Thrane and T.Blix for all help in planning the field investigation, getting instruments, and discussion of the results.

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The people in the valley for providing us with living quarters, transportation, power to the instruments, and supporting us with positive attitude.

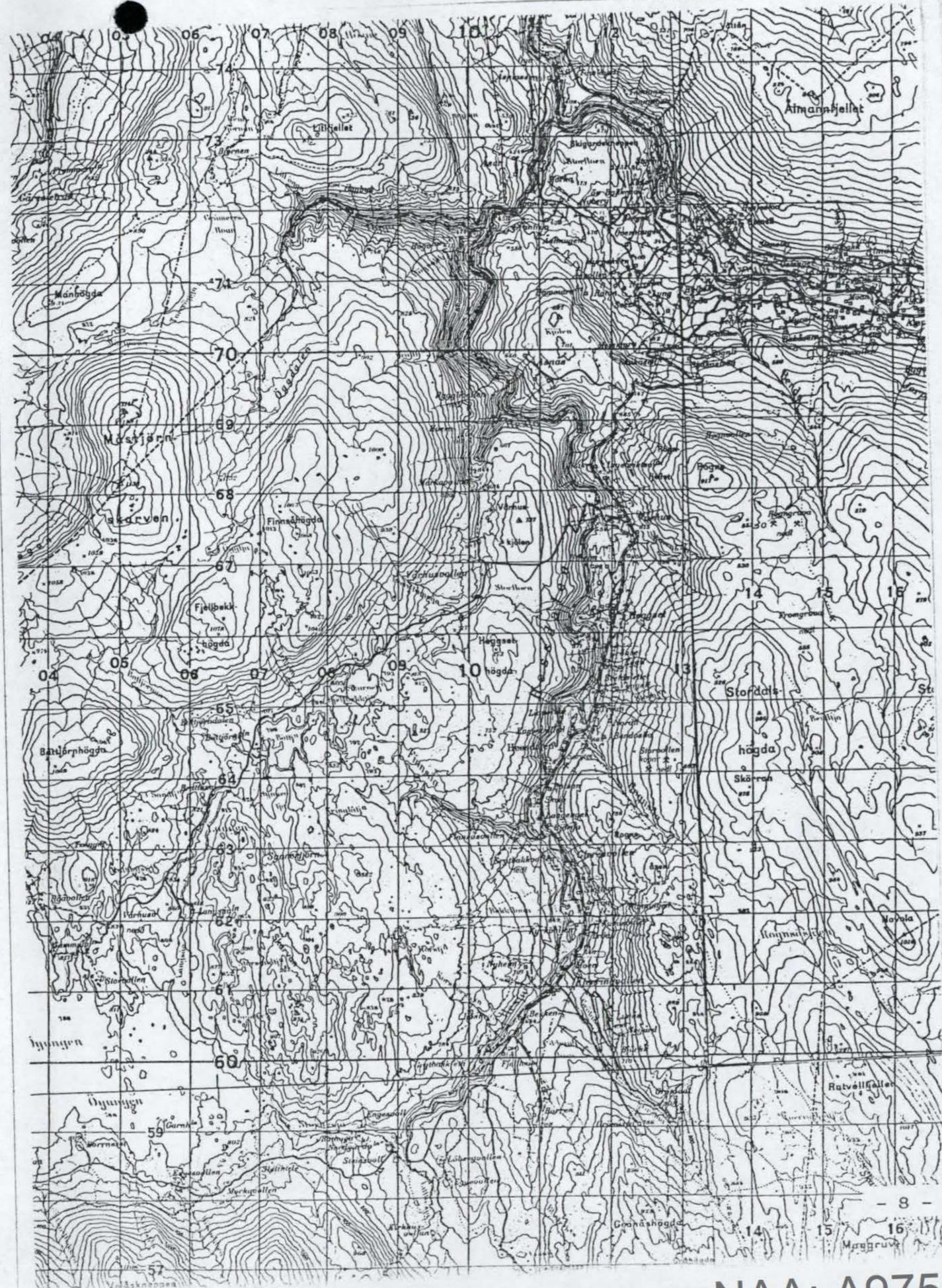
All those who performed excellent fieldwork, free of charge: L.G.Bärting, L.Berggren, L.S.Berlin, J.W.Bjordammen, D.Ekenhage, U.Ekstedt, C.Flemk, H.Gullberg, P.E.Gullberg, M.Heim, J.Hjelvik, J.Karlsson, S.E.Knutsen, M.Kaarbø, B.Lagesson, A.Lindholm, I.Lindstrøm, O.Løvgren, K.Malvik, K.A.Matsson, D.Mattsson, K.Melander, M.Nielsen, M.Nilsson, C.Nordin, S.Ohlsson, M.B.Pellving, K.Persson, K.O.Pettersson, H.Svaerd, U.Tellander, A.P.Thomassen, T.Thomassen, B.Tyselius, J.K.Qvam, K.Aakerlund and others that helped in the project.

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Per Solerud for developing most of the films. Knut Aasheim, Hans Kr. Moe and Rønnaug Hansen for discussion and correction of this report.

The working committee has consisted of:

L.Havik, O.G.Røed, H.Ekstrand, J.Fjellander and myself, Erling Strand. Together we acted as a project leader-team, which had the responsibility for each part of the project.



## 2. THE INSTRUMENTS.

We were facing something unknown, mostly reported as light sources. We wanted to find out what this could be. What should we do?

We focused upon the lights, mainly because most of the reports were dealing with them, and because they were most likely to give results. To find out what kind of instruments we needed, we first studied some of the reports, then we studied what people had proposed as solutions for these unknown lights. That led us to the following instruments:

### - Camera with gratings.

This is the best way of getting information of what kind of light source we are dealing with. Is it a continuous spectrum, or is it not? That is: Is it a light due to a thermal process, or is it not. If not, what gas-combination can it be? If it is, the big question is: What is the energy source?

This is probably one of the most important measurements to be done. If we get an answer to this, then we can choose the further procedure. It will also eliminate the wrong hypothesis. Plasma phenomena may give a line spectra, as for instance the aurora.

We obtained totally 6 gratings, 3 especially designed for spectral analysis: Paton Hawksley TE.216E. We also got one Paton Hawksley TE.218C and TE.215.

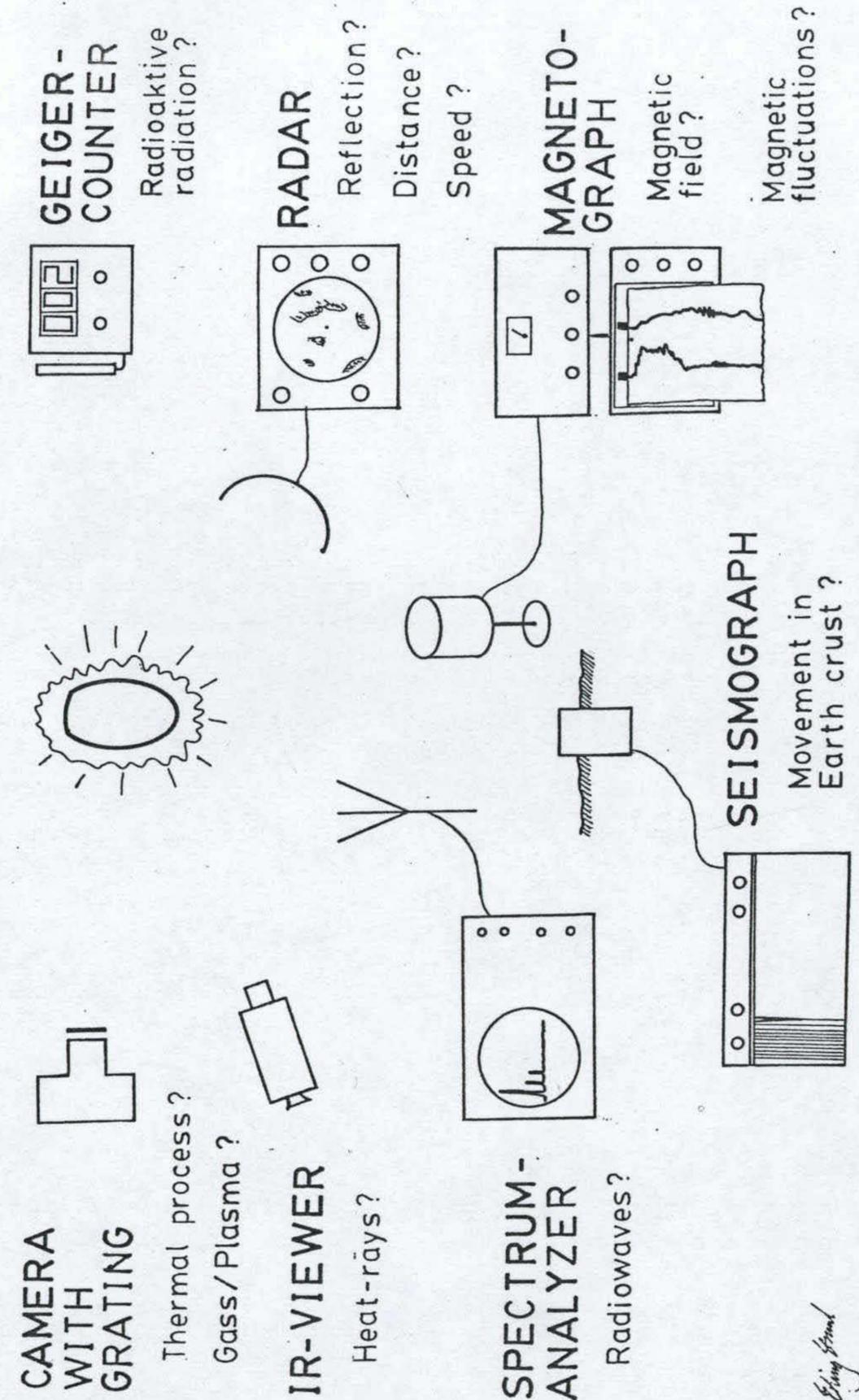
### - Seismograph.

Is this light due to movements in the ground? This is a hypothesis, widely discussed in these days. The hypothesis was proposed by P. Devereux, in his book: "Earth Lights". There could either be a direct connection with movements in the ground, or it could be a connection with the tension in the ground just before or after a movement in the ground.

That hypothesis was the background for the seismological and geological investigation. We installed a seismograph; "MEQ-300 Portable Seismic System", in Hessdalen in October 1983.

We have also got detailed stereoscopic pictures from Hessdalen and the nearby areas. We could then find out more about the geology. This work is done by Dr. sc. nat. M. Heim.

## HESSDAL - PHENOMENON



- Radar.

Do these lights reflect radar waves, and if they do, what is the distance and speed of these lights?

This lead us to the radar: "Atlas 2000". This radar has a wavelength of 3 cm, with a maximum distance of 33km.

- Spectrum analyser.

Many reports from other parts of the world indicate that there has been electrical interference when an unknown aerial phenomenon is nearby. Radio communication has been affected. Even though, nothing of this has been reported from Hessdalen, we decided to watch the spectrum. We coupled a broadband antenna to a spectrum analyser, which swept from 150KHz to 1250MHz continuously. This was a Hewlett Packard, with a 8554L-RF Section, 8552A-IF Section and 141S Display Section.

We also got a Radio interference and field intensity meter; Singer NM-25T. This instrument cover the band from 150 KHz to 32 MHz. The purpose of this instrument was to measure the strenght on any unknown source detected by the spectrum analyser.

- Magnetometer.

There is an hypothesis claiming that this phenomenon may be associated with a magnetic field.

We wanted to test this hypothesis as well. We also wanted to see if there was any connection with magnetical fluctuations (which occur frequently). We got a Fluxgate Magnetometer; Modell FM100, Serial 73. This device had a high sensivity; 1000 gamma gave a reading of 1V. It had three outputs, X (;towards north), Y (towards east) and Z (vertical). We connected this to a two-channel recorder; TOA Electronic Polyrecorder Modell EPR-200A. Then we could record two (of the three) dimensions. This recorder was available only for a small periode of the project. Whenever it was not available, we used an Esterline-Angus Graphic Ampmeter.

The magnetometer was mainly designed to measure slowly varying magnetic fluctuations, as for instance magnetic storms. It was not a pulsationmeter. It had a frequency response within 3 dB from dc to 0.5 Hz. Some of the pulsations were recorded when we used the TOA Polyrecorder. Sometimes they could be hard to read.

- Laser.

A couple of reports from Hessdalen state that the light disappeared when a strong light source was directed towards it. We wanted to test if this was correct. Therefore, we got a 633nm laser from Spectra-Physics Inc. Modell 155. This had a power of 0.4 to 0.76 mW in the TEM(00) mode. The divergence was 1 mrad.

- Geigercounter.

Some people have claimed that there have been radioactive radiation fram such unknown phenomena. Therefore, we got three geigercounters, which countinously measured the background radiation. We had two Radiation Alert Mini, and one home-made with digital readout.

- IR-Viewer.

If there is any strong IR-radiation from these lights, it might be seen with an IR-viewer. We got two of these, from FJW, model 80045.

### 3 THE RESULTS.

#### 3.1 The lights.

During the project period in the field, from 21. January to 26. February, we obtained 188 reports on different lights. These reports have been characterized by two indices:

- One describes the quality of the report, and is given values from G1 to G10. If the report has very few details, it will probably get a G1. If the report is well documented with many details in it, it will get a G9 or G10.
- One index indicates the probability of finding a natural, or a "known light"- explanation. If one can decide, with absolute certainty, that the light the report refers to, is a known light, i.e. an airplane, the report will get a F1. If no explanation is found, it will get a F10.

How can we decide if the report shall get for instance a F5 or a F6? This is of course very difficult, and we have not any specific rules that make the decision clear to us. It is therefore a subjective decision, but it is made by two persons. Even if one report has got a G5 and should had got a G6, the result of giving quality marks is good enough to get an overview of the reports. The same arguments applies to the F-category.

If you study tabel 3.1, you notice there are few reports which both have a high F-score and high G-score. There is 6 reports with F9 and higher. 4 of them have got G7 or higher. That is too little to draw any conclusion about the nature of the light, or to find anything in common. You will find the details about the lights with high F-number in chapter 3.10, and in the appendix.

After studying the reports, I will set a threshold between F4 and F5. A report which has got a F5 or higher might be the Hessdals phenomenon. If we study all reports which have got a F5 or higher, we see that about 68% moved along a north-south axis. If it was exactly on the axis is hard to say. 12% had other moving directions. 3 lights (2 of them have got a F10) changed moving direction during the observation. 2 moved up and down (one F9), and 6 reports have not indicated anything on how the lights moved.

Among these 53 reports, 3 indicate a special kind of movement. One of these was photographed (picture RW1/3). In the picture, you see the start of an oscillation. The frequency of this oscillation is 7Hz +-2Hz. The report tells that this oscillation was growing in amplitude until the light disappeared. Another report indicates that a flickering light stopped flickering, made a big jump, and start flickering again. All the time was it moving towards north. A third report tells about a "waving movement" when it was moving toward north.

39% of the reports (F5 and higher) indicates some kind of

flickering. Two F10 lights was among these. 57% does not mention flickering at all or they say it is a stable light.

	G1	G2	G3	G4	G5	G6	G7	G8	G9	SUM	
F1		8	6	4	1	13	2	47	5	86	135
F2	2	8		2	3	1	1	1		18	
F3		3	1	1	2	1				8	
F4		1	7	1	4	3	7			23	
F5			3	2	2		4	5		16	53
F6		4	1	1	1	3	4	3		17	
F7	1	1		1		2	1	3		9	
F8						2	3			5	
F9		2								2	
F10							2		2	4	
SUM	3	27	18	12	13	25	24	59	7	188	

Tabel 3.1 - Categories of the reports. G=>Goodness, G10 best. F=>Strangeness, F10 something unknown; Hessdals-phenomenon.

#### 3.2 The spectral-analysis.

Out of seven films that were taken with a grating in the front, only four pictures are good enough to see some kind of spectrum. Two strong ones and two weak ones. None of these pictures were taken of a light that have got a F10-G9.

The two strong ones are taken of a light which have got a F5. With other words; it might be a known light. They are taken by Bjørn Lagesson, Sunday the 26. February at 03.08 am. The light was in the mountainside, northwest (366 degrees, out of 400 as max.) of the field station "Hersjøen". First there was a strong flash, then after 20 seconds, a strong "spotlight" was pointing at the observers for a couple of seconds. Then the spotlight was directed straight down for a couple of seconds. Thereafter the direction of the spotlight moved upwards and round in a half circle, and back to the observers once more. Then it suddenly "turned off". The time from the first flash to the "turning off", was about 3 minutes. There were three observers seeing this light. One of them thought it might be the spotlight from a snowscooter. But he was not sure, because the light seemed to be "too strong for that", and it had a little bit "strange movement". Anyway - this made it only a F5 - light, even if it is strange that anyone should be out in the mountain on that time of day. You find the pictures in appendix. Fig.A6.

One of the weak ones, with G7-F6, is analysed in a computer at the University of Oslo. The conclusion of this work is that it is too weak to say what kind of spectrum it is. It seemed to be some kind of spectrum from 560nm to 630nm. The maximum wavelength the film (Tri-X) can tolerate, is about 630nm. We chose to

analyse this picture, because it was best documented, and had the highest F-score. The picture was taken by Arne P. Thomassen on January 25. at 19.10. He and his wife, Tone, was at the southern part of Finnsåhøgda. They saw a bright "planet" low in south-west. It was as bright as Venus at the strongest. It didn't move for a couple of minutes. Then it started to move towards north, on their west side. Arne shot three pictures. Just after Arne had shot the pictures, the light suddenly speeded up, and disappeared. You will find a copy of the picture Arne took in the appendix, together with the data analysis.

We have also one picture taken by me, January 21. at 19.30 (7.30 pm) This is also too weak to say what kind of spectrum it is. The picture have also a lot of low and high orders of star spectra.

As I have mentioned earlier, I will set the criterion between F4 and F5: Any light that has got a "score" of F5 or higher, should be treated as if it was the Hessdals phenomenon. Because the pictures you see in appendix, taken 26. February, lies just at the limit, this picture can not be used as a proof that the Hessdals phenomenon has a continuous spectrum.

### 3.3 The Seismograph.

The seismograph was installed october the 24. 1983. We have not recorded any local seismic activity. All recordings on the seismograph was from earhtquakes, or movements in the ground, with centers a long way from Hessdalen.

The sensitivity we obtained with this installation was 1.5 on Richters scale.

The Hessdalen area is not so well covered from other seismological stations. In Norway, the nearest station to the south is Hamar, in west Florø, in north Tromsø. There has to be a quake with a greater amplitude than 2.5 on Richters scale in the Hessdalen area, to be detected on one of the nearest stations.

Inside a radius of 70km from Hessdalen, there have been detected four quakes, all small in amplitude, during the last 6 years. Inside a radius of 50km, there have been 15 recordings, during the last 100 years. Even though the area hasn't got any good cover, you can say that there is very little seismological activity, compared with other areas in Norway.

Until know, we have not found any connection between the phenomenon and movements in the ground.

Details of the recordings on the seismograph (from quakes in other parts of the world), and a list of seismological activity from 1887, within 50km from Hessdalen, will be found in the appendix.

### 3.4 The radar recordings.

Totally, we have 36 radar recordings. Three of those were probably also seen as lights. All the others were not observed visually. Nine times we could follow this reflection on the radarscreen, travelling on a nearly straight line. We have taken pictures out in the air, where the radarscreen said there was something. But the pictures didn't show anything unusual.

Most recordings was done 2., 3. and 4. of February. More details in appendix.

Two times, we managed to take a picture of such a reflection. As you can see in the picture (fig.A9,A10 in appendix), this reflection is as strong as the reflections from the mountains. Such a strong reflection can be caused by a solid object, a strong gradient of for instance temperature, humidity or pressure. The picture is analysed by a radar expert at NDRE, and he said:"If this isn't a reflection of a solid object, but only gas in the air, the gas has to be locally and strongly ionised. Otherwise, it wouldn't give such a strong reflection."

We did not get reflections from all lights. The reason for that might be the following. Mostly, we had the radar adjusted to show only 5.5 km. Those three times we did get anything on radar together with light, happened when the screen was adjusted on a longer distance. The reason might be that the lights were out of distance when the radar was adjusted to 5.5 km.

Why didn't we have the radar adjusted to maximum range; 33km, all the time? The reason for that is that we waited for the light that used to travel in front of Finnsåhøgda. Then we had to have it adjusted for small distance. It is about 2km to Finnsåhøgda.

One of the three times the light was followed with the eyes and was seen as a reflection on the radarscreen at the same time and direction, there were reflection every second sweep. But the light was seen all the time. Could it be that that the light does not reflect radar waves all the time? Only sometimes? The same thing happened a couple of times when we didn't see the light: Reflection every second sweep. Is it possible that it might "react" to radar waves? Was it because of the radar that it didn't reflect the second time? The technical data on the radar, and a copy of some of the recordings will be found in the appendix.

- The first time we saw a reflection on radar in the same direction as we saw the light, was Saturday 21 January at 17.50. It was a light which travelled towards north, northeast over Finnsåhøgda. When it was in north, it nearly stopped travelling and suddenly went right down and disapeared. We got one reflection on the radar in the same direction (+5 degrees), when it went straight down.

- The second time was Wednesday 25 January at 17.32 (5.52pm). The observers said: "A big object came from south, moving towards north over Finnsåhøgda." When the light was just over Finnsåhøgda, there was a reflection on the radar, in the same direction (+5 degrees) as the observers saw the light. The light was travelling slowly towards north, all the time. On the next radarsweep, no reflection was seen. On the sweep after that, it was seen again. No more reflection was seen when it was travelling towards north.

- The third time was Friday 27 January at 22.58 (10.58pm). A light was travelling from south to north. The speed seemed to be very large. There were two echoes on the screen. The time between them was 2.4 seconds, and the distance between them was about 20km to 21km. Just after (3 seconds) it was seen on the radar, the radar observer went outside. The observers outside told what they had seen. Both the direction of motion and the speed they indicated, seemed to be the same as the radar observer saw. The distance is hard to decide for the observers. The accuracy of the time of observing visually and on the radar screen is within about 3 seconds.

### 3.5 The Spectrum Analyser.

We did not see anything on the spectrum analyser at the same time we saw the lights, but we did get some unknown recordings at other times.

The analyser was adjusted to show the whole frequency band in one sweep. That is from 100kHz to 1250MHz. These unknown recordings showed up as "spikes" with about 80MHz between them. They went up and down with nearly equal amplitude on the whole band.

These recordings was done from 29 January to 3 February, with a maximum the 3 February.

A natural explanation of these recordings, is noise from the radar. An argument against that explanation is the fact that we saw no noise on the radar screen when we got the spikes on the spektrum analyser.

### 3.6 Magnetometer.

We have not found any simple correlation with the phenomenon and the "slowly-varying" magnetical fluctuations. But there is a correlation of about 40% with the pulsation-registrations: 4 of 10 registrations with an F5 or higher, from feb. 11. to 14., came almost exactly at the same time as a pulsation. But during those days, there were many recordings of pulsations. So there is a possibility that there was a coincidence that the light showed up the same time when there was a pulsation. More observations are needed.

The reason why we had recordings of pulsations only from Feb.11. to Feb.14, is because that was the time we had a recorder that was fast enough to record the pulsations; TOA Electronic Polyrecorder. The other times, we had the Esterline-Angus Graphic Ampmeter, which only recorded the slowly-varying magnetical fluctuations.

If we go on for another period, we should have a pulsation magnetometer. Even though the Fluxgate magnetometer did record pulsations, it could sometimes be difficult to read the pulsations. Expecially when there were magnetical storms.

In the appendix, you will find the collected data from the magnetometer. In the tables below, you find the times and approximate amplitude of the pulsations, and the F-number of the lights.

### OVERVIEW OF THE PULSATION RECORDINGS AND THE LIGHT RECORDINGS.

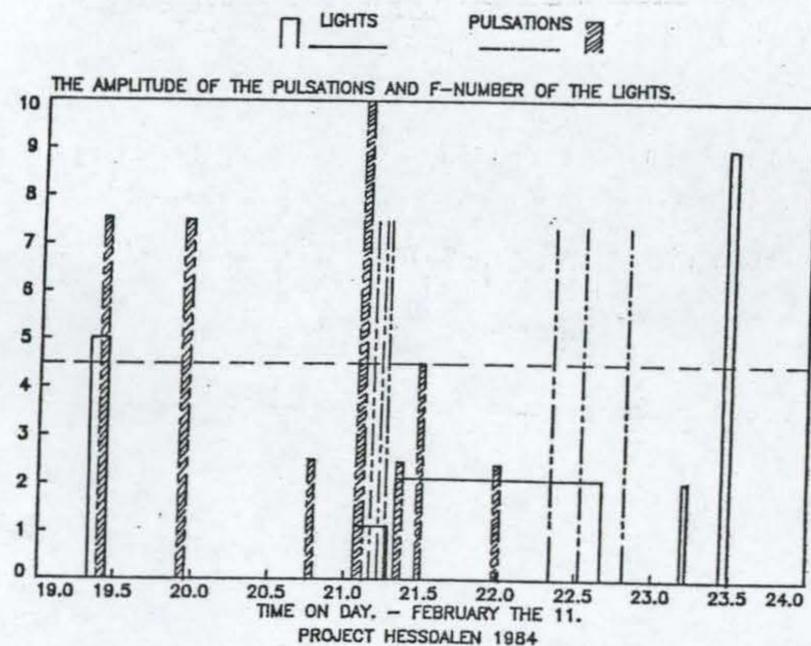


Fig. 3.6.1 - Recordings on the 11. February.

OVERVIEW OF THE PULSATION RECORDINGS AND THE LIGHT RECORDINGS.

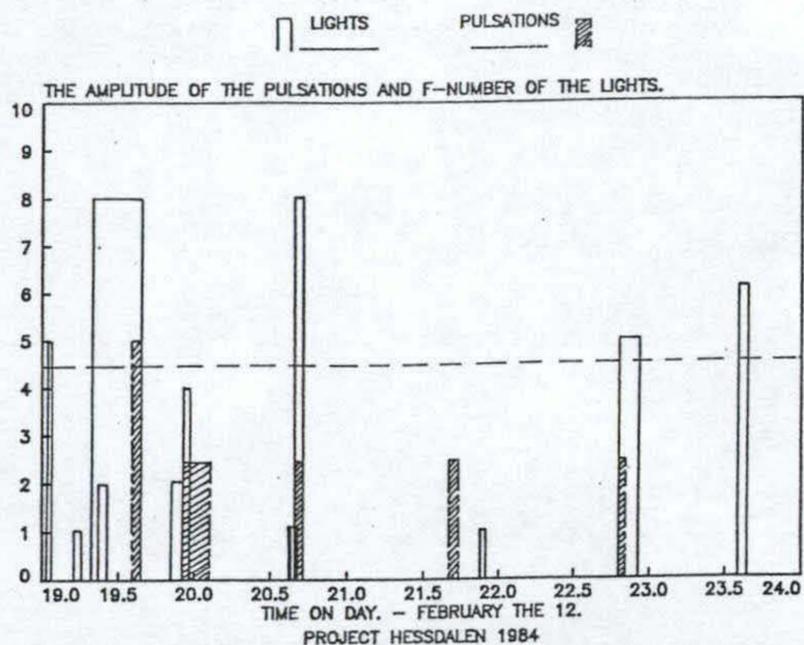


Fig. 3.6.2 - Recordings on the 12. February.

OVERVIEW OF THE PULSATION RECORDINGS AND THE LIGHT RECORDINGS.

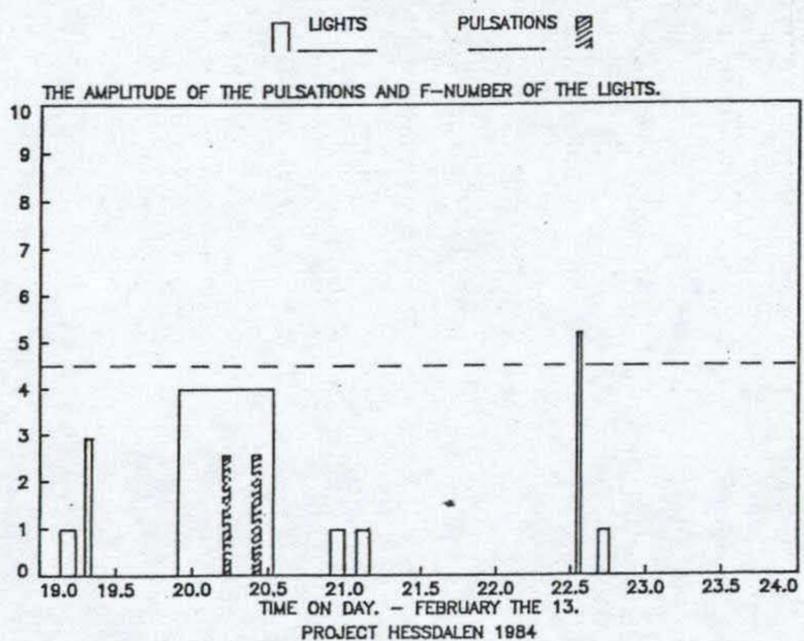


Fig.3.6.3 - Recordings on the 13. February.

OVERVIEW OF THE PULSATION RECORDINGS AND THE LIGHT RECORDINGS.

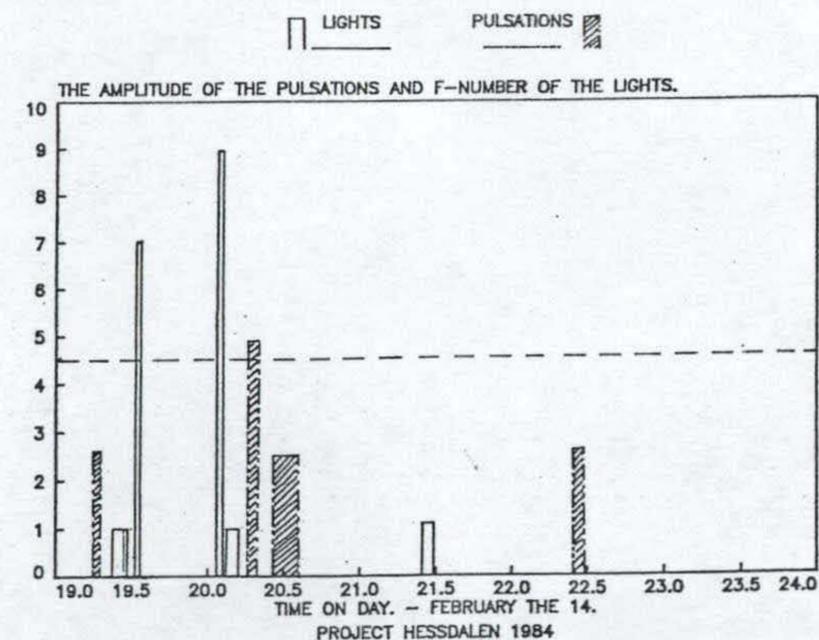


Fig.3.6.4 - Recordings on the 14. February.

3.7 Laser.

We used the laser, and pointed it towards a flashing light, in two different cases, totally 9 times. 8 of these times, there was a reaction.

In the first case, there was a regular flashing light, slowly moving towards north, Sunday 12. at 19.35 (7.35pm). The flashing had been regular all the time we had seen the light. The light moved slowly. From the first time we saw it in the south, until it disappeared in the north, it took about 15 min. When this light was in the northern part of Finnsåhøgda, we pointed the laser towards it for the first time. At once, it changed the flashing sequence: From a regular flashing light, it became a regular double-flashing light:  
Flash.Flash.....Flash.Flash.....Flash.Flash.....

After about 10 seconds, we put the laser down, at once it became a regular single-flashing light again:

Flash.....Flash.....Flash.....

After about 10 seconds we repeated this again. It was repeated totally 4 times before it went out of sight. All the times, we got this double flashing, when the laser was pointing at it.

The second case, the same type of light came from north and moved towards south. It was the same day, Sunday 12. at 20.41. When the light was in west, we pointed the laser towards it. The same thing happened now; it changed to a double-flashing light when the laser pointed towards it. This time we did it 5 times. Only the last of these times did we not get any double-flashing. But 4 of these 5 times, we got it.

The test was done like this: Kurt Persson used binoculars looking at the light. He told what he was seeing all the time; he said: "Flash...flash...flash...". I (Erling Strand) used the laser. He could not see where I was pointing with the laser. When I raised the laser, pointing at the light, he said: "Flash.flash.....flash.flash.....flash.flash.....". May Britt Pellving was a witness to what we was doing. There were also other persons out at that moment, but they were concentrating on their work.

### 3.8 Geigercounter.

The geigercounters we used made a biping sound, every time it made a measurement. They were functioning all the time, but we could not hear any change in the count rate during a light observation. I have to point out that we never had these lights close (< 1km) to the counters.

### 3.9 IR-Viewer.

The two times we used the IR-viewers, we saw no strong IR-radiation.

But we used it only on lights far away. The power from the lights could have been too weak to be detected on our IR-veiwer. And since we used it only two times, it should be clear that there is not enough material to draw any conclusion.

### 3.10 F10 lights.

I will now go through the reports which have got a score of F10.

Monday 20. February at 18.12 (6.12pm): Red Light.

Maybe the most "unexplainable" happening was the red light on the ground. It happened monday 20. feb. Leif Havik was alone in the caravan. He was dressing. Åge Moe (farmer from Hessdalen) and Edvin Kværnes (also from Hessdalen), had just arrived. They waited outside the caravan. Moe at the north side, besides the door into the caravan, and Kværnes at the south side. They should all go into Øyungneset, to see the lights from that place. Just when Leif went out of the caravan, a red light moved around his feet and disappered. The duration was a few seconds. Moe said:"Look at the reflex". That was the only explanation he could figure out at that time. Leif saw at once that it was the same type of light as from our laser. The laser we had used was at that time in Oslo.

To check if it really was the same type of light, as from our laser, we brought the laser back the 25.feb. Moe had never seen a laser before. We brought him to the caravan. It was about the same time of day when we did this checking. When I put the light onto the snow, just beside our feets, Moe said:"That's exactly what I saw! But it was a litle bit weaker." Then I put the light on the floor in the caravan, and he said:"It was a little bit stronger than that."

What could make such a light on the snow. It was very strong. What could it be? All the lights in the caravan had been switched off before this happened. There were no lights outside. It could not have been light from the houses. The nearest house is about 500m away, and it is below a hill. The nearest house you can see is 2km away, in the south. The light showed up on the northern side of the caravan. All the houses you can see is on the southern side. And if any of the inhabitants should have a laser (very doubtful), Probably the only place that person could have been, was in an airplane with no engine and with no lights. - We have not found any explanation on this light, and I don't believe we will either. In the discussion, Leif said:"If I only had put my hand above it, then I could have found out where it came from. But I didn't think of that when I saw it." A second after the light had been "switched off", they looked up in the air, but nothing was seen. It was cloudy, but just over the caravan, there was a little opening in the clouds, and there did they see the stars.

Friday 17. February at 18.05 to 19.30: Yellow light.

The report written by Ove Løvgren, from Hersjøen says:  
"At 18.05 Ove Joakim Karlsson and Dick Ekenhage went up to the observing place. They came from the cottage. When they were 150 meter from the cottage, they saw a light on the west side of Hersjøen. At 18.15, made they some filming at took some pictures. At 18.25 they thought it was a cottage, because it hadn't moved. Joakim thought he saw two flashes from the light, but they went on up to the observing place. At 19.30 came a yellow light, which was two lights close together, from the western part of Hersjøen. It went to north east, but changed direction, and went right to us. We took photos. When Joakim called on the walkie-talkie, it took a couple of seconds and the light burned out. The light was about 600m to 1000m from us, when this happened. Nothing more was seen, and no sounds could be heard, even when it was close to us."

- When we study the local map, we see that there is 3 to 4 km from the observing place to the mountain on the western part of Hersjøen. If they used that distance as a reference, it might be correct the distance they indicated where the light burned out. - It was the same light as Joakim and Dick saw between 18.05 and 18.25 that moved at 19.30. The report was not clear on that point. They looked at this light often during the time from 18.05 to 19.30. - The film they took show only a moving light. No other reference is in the movie. Then we can't be sure if the movement is caused by the light movement or movement of the camera.

All this together made it a F10 light.

Thursday 2. February at 20.11 (8.11pm): A bright "object".

This was the same type of light which has been photograph earlier (see fig.A7). It was three separate lights moving towards north, just over Finnsåhøgda. It seemed to be quit near. The distance to Finnsåhøgda from the observing place is about 1500m. The distance to the light was about 2km to 2.5km. The observers could see these three bright lights. They indicated also that they could see a darker area in between the bright lights, and also smaller and weaker white light. The movement of the three bright lights was so that it seemed to be fixed onto one "object". Two of them was yellow-white lights and they seemed to be in the back, and a red one seemed to be in the front.

These lights were moving over Finnsåhøgda towards the eastern part of Litlfjellet. They seemed to be near and just over the mountain. When they were over Litlfjellet, they seemed to be in the same high as the top of Litlfjellet. They had, what the observers called; a waving movement.

At this time, there were none at the headquarter. That is why no instrumentation reading could be done. The lights was observed from Jon Aspås place at Aspås. Leif Havik had a coffebreak at Jon Aspås, when Åge Moe phoned and told about the light which was coming. He called at 20.11. Just after that Lars Lillevold called and said the same thing. Åsmund Aspås and Johannes Lyngstad were also at Jon's place. Edvind Kvarnes was at Åge Moe. They all went out, and Leif took a camera with a 400mm lens in front. He took some pictures. These pictures was not succeeded, because there was no tripod. You can only see a light moving all over the pictures. These movements is because of moving the camera. The time from Leif Havik saw the light over Finnsåhøgda and till it went out of sight by Litlfjellet, was between 1.5 minutes and 2.5 minutes. Jon A. Aspås and his children had also seen it from Heggset.

Friday 27. February at 22.58 (11.58pm): A bright light.

Just after a plane was observed, moving towards north, a bright light was seen through binoculars over Brattbekken on Finnsåhøgda. Jon Aspås and Ruth Marry Moe were observers. Leif Havik was looking at the radar screen. The observers saw the light move with a large speed to the northwest. At that moment, Leif Havik saw two following echoes on the radar. The distance between the two ecco's was about 20370m +-1000m. The time between them was 2.4 seconds. That give a mean speed of about 8000m/s to 9000m/s.

Just after Leif had seen the echoes, he went outside. Then the observers told that they had just seen a light moving with a large speed from south to northwest over Finnsåhøgda.

Their indication of the speed, direction of motion and time seemed to be the same as Leif saw on the screen. The accuracy of the time is about 2 - 3 seconds.

#### 4. DISCUSSION.

- What have we learned, and what should we have done differently?

##### 4.1 The sightings.

Totally we have reports on about 188 sightings. That includes the reports that were written on planes too; 86. There were of course more planes totally during the project period, but none had written any report on the others.

If you study the summary of the reports, in the appendix, and study the timetable of the planes, you might say that more reports should have a higher "F-score". This is probably right, but the reason why they haven't got any higher score, is that many of them did not look as anything unknown.

If we had got a direct line to the radar station, that covers the district, we could perhaps have picked out the planes easily. That means that we would have got few reports with a score between F2 and F8. And then we would have got a more correct picture of the unknown light: When and where. The line to the radarstation will probably be "connected" in a next project period. All recordings on planes moving to Vårnes airport (200km in north) can then be noted. And if we together with this could register all planes that we see, we could easily pick out the planes afterwards.

It is also important that we take measurements of all lights that we are not 100% sure is a known light. We once had a very good opportunity to make measurements; take spectral pictures of a F10-light; the one at 18.05 friday 17. february. But the reporters "thought" it was a cottage. After it started to move, they became sure that it was no cottage light, but it was too late to make any good measurements.

We must be more clever with the documentation of the photos. Some of the best pictures, did not agree completely with the report. The observers should have taken reference pictures that couldn't have been mistaken. Even though this can be made better, and it will this winter, we have many documented pictures of the lights.

We did not have a continuous watch on all stations. So the fact that we have less reports before the 11.february and in the last time of the period, is mainly because of lack of personnel.

##### 4.2 The spectral analysis.

Many of the spectral films had too much noise; higher order spectra from known lights. If we had built a special screen on the cameras, this type of noise could have been avoided. That is, we could have had more spectral pictures. We have learned from this mistake, and I am hope that we will succeed in taking a spectral picture of a F10 light next time.

We only got four spectral pictures out of seven films, mainly because we didn't use this screen, and because the exposure time on the cameras sometimes was too short, and because the light sometimes moved too fast.

Next time we will have this screen. If we also could have a light amplifier on some cameras, The probability of taking a good spectral photo will increase.

##### 4.3 The radar and spectrum analyser.

We did not manage to watch the radar and spectrum analyser screens all the time. That means that it might have been more registrations on these than we have noticed. That's mainly because of lack of personnel.

Next time we should have instruments that could record every change in the screen. This should be possible with a spectrum analyser. But radar equipment with this possibility is difficult to obtain. If we don't get this, we should stress that more people should be at the main station.

##### 4.4 The magnetometer.

When we analyse the recordings afterwards, and find that probably no connection exists with the slowly varying magnetical fluctuations, only the pulsations, we can say that it is a pity that we didn't have a pulsation magnetometer, and that we didn't have the TOA-recorder all the time. Next time, we know that this is the main issue to stress on the magnetical part.

##### 4.5 The laser.

The results from the laser test are very surprising. Even though we have heard that one person have done a light test before and succeeded, I personally thought this test was only a coincidence. But we did also get a result, 8 out of 9 times. We could have done this test more times. And I think we will another time. Maybe even a stronger laser ?

#### 4.6 The geigercounter and the IR-viewer.

Even if we didn't register anything on these instruments, I think we should have them with us another time.

We didn't have any lights close to the station. If we have had that, maybe there had been a recording? The IR-viewer we only used twice, and I have already mentioned that that is not enough to draw any conclusion.

#### 4.7 The "nonworking" instruments.

Many times during the project periode, the cameraes failed. This happened mostly when we needed them most. Such happenings should also been registrated. Even some of the other instruments failed when we needed them most, mainly because of bad power connection. All such events should be recorded.

#### 5. CONCLUSION.

What is this phenomenon? What do we know about it?

We have not found out what this phenomenon is. That could hardly be expected either. But we know that the phenomenon, whatever it is, can be measured.

Besides the light measurement, it can be "measured" by radar and laser. Perhaps the measurements we did on the magnetograph and spectrumalyzer is due to this phenomenon as well. We have to do more measurements with these instruments, before we can be sure of that.

We got no measurements with the geiger-counter, seismograph or IR-viewer. But I will prefer to bring these instruments as well in the next period. And it might be useful to also record events that seem to be unimportant. We stand in front of something unknown, and we must collect everything that might lead us to an answer on what this is.

Some hypothesis, of what this phenomenon is, might be weakened or strenghtened after analysing the measurements in this report. However, the different hypotheses will not be discussed here. The report is more intended to set a basis for further discussion on what it can be, and what should be used in the next period.

Erling Strand (sign.)

5 January 1985.

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A P P E N D I X .

A1. Summary of the reports.

The reports are either a separate written report, notes on tape, or notes on paper. If there is no space between two reports in this list, is it the same light that is reported in two or three reports.

The summary of the reports will be written as following:

Hour.Minutes: Place; Category; Story.....

Film name,no. ; .....Story.

The place is:

- (1): Aspåskjølen
- (2): Hersjøen
- (3): Litlfjellet
- (4): Finnsåhøgda (south)
- (5): Kjerrengvoll.
- (6): Heggset.
- (7): The intersection where the road from the headquarter leads out onto the main road.
- (8): Øyungen.

The category is:

F: Indicate how difficult it will be to find an explanation for the light. F1 marks with a hundred percent certainly that the light is known; i.e an aeroplane. F10 markes that no explanation is found.

G: Indicate how good the report is. If the report contains many details, or if it contains details enough to get a satisfactory explanation, it will get a G9 or G10. If the report contains very few details, it will get a G1.

Saturday 21. january.

17.33:(5);G6,F1; A plane towards north.

17.45:(5);G7,F6; A yellow-white light showed up in the direction of Rødhovde. Sometimes it flickered with uneven frequency and uneven amplitude. It had a irregular movement. It moved towards the north over Finnsåhøgda. and disappeared from sight at 17.48.

17.50:(1);G7,F8; A red light to the north. Recording on radar.  
ES1/1-3

18.03:(5);G7,F6; A light showed up over Finnsåhøgda. It moved towards south-west. It was flickering. When it was over Fjellbekkhøgda, we saw that there were two lights. They were about 10 degrees apart. The last one was a little bit weaker. They moved in this way some minutes. Then, the last one moved up 10 degrees, and disappeared a short time after. The flickering was uneven. In between the strong flickering, there were several (weak) flickerings. The bright one continued towards south-west, and became weaker (longer distance). Just before it went out of sight, it stopped flickering, made a big jump, and started to flick again. It went out of sight at 18.17.

18.10:(1);G4,F4; Flashing light in south-west.  
ES/4

19.20:(1);G6,F7; Light with strange "jumps" in south-west. This jumping stopped suddenly, and it moved towards north. Sometimes there were strange movements, but not with any big amplitude. While it was seen in north, it first slowly started to oscillate and suddenly made a big movement, like a "S", up in the air and disappeared. This happened at 19.30.

19.26:(1);G3,F1; Plane towards south.  
RW1/5

19.40:(1);G5,F4; Light in the south-west, moving towards north.  
ES1/18 Duration about two minutes.

21.20:(1);G2,F3; Flickering light in south-west.  
OGR/11

Sunday 22. january.

01.50:(1);G2,F3; Flickering light over Finnsåhøgda.  
OGR/12,13

17.45:(1);G2,F2; Bright light moving towards north.(Plane?)

19.20:(1);G2,F3; Flickering light just above Litlfjellet. It moved towards north. It dissapered at 19.25.  
OGR/14

19.45:(1);G2,F2; Light moving towards north. Strange movement.  
OGR/17-19

Tuesday 24. January.

19.15:(4);G6,F4; Light in the east, with unregular flickering.  
APT1/3 It moved towards south.

19.20:(4);G6,F7; Many white lights with a big flashing red  
APT1/4-12 light, came from north, turned around  
"Fjellbekktoppen", and moved towards north.

19.40:(4);G6,F1; Plane towards north.  
APT1/13-15

Wednesday 25. January.

17.32:(1);G6,F8; Big "object" from south. Unregular white and  
red lights. Radar contact. Two echos. (See  
separate radar report)

17.41:(1);G6,F1; A plane over the station, moving towards north.

18.24:(1);G6,F1; A plane moving towards south.

18.40:(1);G6,F1; A plane moving towards north, north-east.

19.05:(1);G6,F1; A plane moving towards north, north-east.

19.10:(4);G7,F6; A yellow light, as bright as Venus, stood still  
APT1/22-24 a couple of minutes in south-west. 20 degree  
over the horizon. Suddenly it started to move  
towards north, in west. "Just after I had taken  
three photos with the camera (with grating),  
it suddenly speeded up and disappered behind  
Fjellbekkhøgda".

19.16:(1);G5,F4; A yellow-red light moved towards north over  
LH1/  
Finnsåhøgda.

19.35:(1);G6,F1; A plane moving towards south.

20.12:(1);G6,F1; A plane moving towards south.

20.12:(1);G4,F6; A red flickering light moving towards the  
north, in the west. It moves down, when it is in  
the north.

20.54:(1);G6,F1; A plane moving towards south.

21.53:(1);G6,F1; A plane moving towards south.

22.00:(1);G6,F1; A plane moving towards north.

22.43:(1);G6,F2; A plane? moving towards north. No sound.

23.21:(1);G7,F1; A plane moving towards south.

Thursday 26. January.

22.47:(1);G4,F5; A bright light with a red light in front,  
moving towards north.

Friday 27. January.

22.53:(4);G2,F1; Plane.

22.56:(4);G5,F6; The big light (as a jumbojet) moved in the same  
course as the plane, but a little bit slower  
and lower.

22.58:(1);G9,F10; A bright light moving from south to north.  
It showed a large speed. This light was also  
registred on radar. The radar measured a  
minimum speed of about 8000m/s to 9000m/s.  
See seperate radar report.

Sunday 29. January.

17.31:(1);G3,F4; A light moving towards north.

Tuesday 31. January.

22.48:(1);G3,F4; A light moving towards north.

Wednesday 1. february.

13.59:(1);G9,F1; Two small planes coming from Rognefjell, moving  
towards north. They were seen on the radar.

Thursday 2. february.

20.11:(1');G7,F10; A bright "object" moving towards north. It  
has two yellow-white lights, and it is darker  
in the middle. It has a red light in the front.  
The movement was "waving". It was near and low,  
just over Finnsåhøgda, and it moved towards  
the eastern part of Litlfjellet.

Friday 3. february.

23.02:(7);G2,F6; A light just over the headquarter, moving up and down.

Sunday 5. february.

23.00:(1);G3,F4; A light moved straight down in the southern part of Finnsåhøgda.

Tuesday 7. february.

20.11:(1);G3,F4; A bright yellow light with a flickering red light, moving towards north.

22.47:(1);G3,F3; A light moving towards north.

Wednesday 8. February.

19.53:(1);G2,F4; A yellow light moved straight down, west of Litlfjellet.

Saturday 11. February.

18.44:(1);G6,F3; A light moved straight down between the two lowest stars in Big Dipper.

19.20:(2);G7,F5; A yellow light moving towards north. It was seen in the west.

19.21:(1);G8,F5; A yellow light with a flickering red light, moving from south-west to north-east. It went out of sight at 19.25.

21.04:(2);G8,F1; A big light in the sky. Probably reflex. It disappears at 21.17.

21.20:(2);G5,F2; A big weak light on the mountain. Probably reflex? It disappears at 22.40.

23.10:(2);G5,F2; Light in the sky. Reflection?

23.27:(1);G2,F9; A yellow-orange light in the east. The mountain is seen behind the light. It moves up and down.

Sunday 12. February.

18.18:(1);G2,F2; Plane (?) towards south.

18.29:(1);G2,F2; Plane (?) towards south.

18.35:(2);G5,F4; A yellow-orange light moving towards south. H001/4-8

18.39:(1);G2,F2; Plane (?) towards south.

18.41:(1);G1,F2; Two planes (?)

19.02:(2);G7,F5; A red light in the north, just over the horizon, moving towards west. Duration 1 minute. H001/9,10

19.13:(1);G2,F1; A plane.

19.20:(1);G7,F8; A red flickering light in the south, moving towards the north.

19.22:(2);--"--; The light meets a plane (G3,F2), that travels towards south.

19.25:(2);G7,F8; Bright light in west, moving towards north.

19.35:(1);--"--; A red flickering light just over Finnsåhøgda. The first test with laser. Reaction! Four out of four tests.

19.52:(1);G2,F2; Plane moving from north towards south. ES2/10

19.55:(2);G5,F3; Light in the west, moving towards south.

19.55:(1);G3,F4; A red "double-light" in south-west.

20.40:(1);G4,F1; A plane moving towards south.

20.41:(1);G6,F8; A flickering light moved from Litlfjellet to Finnsåhøgda. It moves down in the southern part of Finnsåhøgda. Second test with laser. Reaction! Three out of four tests.

21.53:(1);G8,F1; Plane towards north. LH1/19-23

22.48:(1);G8,F5; A light moving towards north. LH1/24-28

22.50:(2);G5,F5; A yellow light moving towards north. Duration  
H001/15,16 two minutes.

22.52:(1);--"--; Light moving towards north.

23.39:(2);G6,F6; Yellow light moving towards south. Duration  
30 sec.

Monday 13. February.

00.30:(5);G1,F7; A big light over Hersjøen. It stood still for a  
couple of minutes. Then it moved fast towards  
north-west, and stopped over Øyungen.

17.58:(1);G8,F1; A plane moving towards south.

18.02:(1);G4,F2; A satellite moving towards north-east.

18.19:(1);G8,F1; A plane moving towards south.

19.18:(1);G8,F1; A plane moving towards south.

19.39:(1);G4,F3; A light moving fast down on the mountainside.  
Reflex?

19.55:(2);G7,F4; An orange light "lay" on the egde of the  
mountain in north-west, for 40 minutes.

20.56:(1);G8,F1; A plane moving towards south.

21.05:(1);G8,F1; A plane moving towards north.

22.35:(2);G8,F6; An orange light in south, 10 degrees over the  
mountain. It turned out after 10 sek.

22.42:(1);G3,F1; A plane.

Tuesday 14. February.

06.07:(2);G8,F2; A white light moving upwards, in the west.  
Duration 4 sek.

13.40:(1);G2,F1; A plane.

16.54:(1);G8,F1; A plane moving towards north.

18.08:(2);G7,F1; A flickering light in south-east, 10 degrees  
H002/3,4 over the mountain.- A star.

19.22:(1);G4,F1; A plane moving towards north.

19.29:(1);G3,F1; A plane moving towards north.

19.32:(1);G2,F7; Three flashes in the south-east. First weak,  
then stronger and the last one very strong.

20.06:(1);G2,F9; Some flickering, in a short time, just by  
Hammerkneppen(?), in the north. It seemed to be  
very close to the headquarter.

20.12:(1);G8,F1; A plane moving towards north.

21.24:(1);G6,F1; A plane moving towards south.

Wednesday 15. February.

13.30:(1);G9,F1; A privat plane moving towards south, on the  
east side of the station. Also registred on  
radar.

16.44:(1);G8,F1; A privat plane moving towards south, on the  
east side of the station.

18.49:(1);G2,F6; A red flickering light moving towards north.

18.55:(1);G2,F6; A red flickering light moving towards north.

19.12:(1);G8,F1; A plane moving towards north.

19.28:(1);G3,F6; Red flickering light moving towards west, in  
the northern part of Litlfjellet.

19.30:(2);G6,F4; A yellow light moving towards north, in the  
west. It went out of sight at 19.38.

19.46:(2);G6,F6; A red unregular flickering light, moving towards  
H002/5 north, in west. 25 to 30 degrees over the mountain.  
It ended/went out of sight at 19.52.

19.54:(2);G6,F6; A red unregular flickering light, moving towards  
H002/7 north. 20 degree over the mountain. It ended/went  
out of sight at 20.06.

20.21:(2);G7,F7; A red flickering light, moving from the north to  
the south. It met a yellow light, which went  
over the red one. The red light was seen in 8  
minutes, the yellow in 4 minutes.

21.00:(2);G8,F5; A yellow light, moving from the north-west to  
H002/19 the south-east. 25 degrees over the mountain. It went  
out of sight at 21.12.

21.05:(1);G8,F5; A yellow-white-red light moving from north-east  
LH1/31,32 to south-west. It went out of sight at 21.08.

22.00:(1);G8,F1; A plane moving towards south.

22.06:(1);G8,F1; A plane moving towards north.

22.46:(1);G8,F6; A big oval light, with a darker area in the  
LH2/00-1 middle, moving from the south to the north, over  
Finnsåhøgda and west of Litlfjellet. It moved  
very low.

23.15:(1);G8,F1; A plane moving towards north.

Thursday 16. February.

18.26:(2);G8,F1; A yellow light in the west, moving towards  
H002/21,22,23 south.  
18.26:(1);G8,F1; A plane  
19.33:(2);G7,F4; A yellow light in the west, moving towards  
H002/24-27 north.  
19.34:(1);G7,F4; A light moving towards north.  
19.45:(2);G4,F7; 5 or 6 red flashes in the west, moving towards  
south. 5 sek.  
19.46:(1);G4,F7; 5 red flashes in the south.  
20.10:(1);G7,F4; A light moving from the south to the north.  
LH2/3-7 It was seen until 20.14.  
20.12:(2);G7,F4; A yellow light in the west, moving towards north.  
H002/28,29  
20.35:(1);G8,F1; A plane moving towards south.  
21.00:(1);G8,F1; A plane moving towards south.  
LH2/8  
21.01:(2);G8,F1; A yellow light in the west, moving towards  
H004/2-5 south.  
21.24:(2);G7,F6; A red light in the west, moving towards south.  
H003/3,4 40 degrees over the mountain. Duration 3 min.  
21.53:(1);G8,F1; A plane moving towards south.  
21.59:(2);G7,F4; A yellow light in west, moving towards north.  
H003/3,4 10 degrees high. Duration 3 minutes.  
22.21:(1);G2,F6; A light moving towards south.  
22.42:(1);G8,F1; A plane moving towards north.  
22.58:(1);G8,F6; A big light moving towards north in west. It  
LH2/9-15 went out of sight at 23.01.  
23.12:(1);G8,F1; A plane moving towards north.  
23.26:(2);G6,F4; A strong white light moving upwards, from north  
to south. Duration 2 sek.

Friday 17. February.

17.15:(1);G2,F1; A plane  
17.33:(1);G4,F1; A plane moving from north to south.  
17.47:(1);G4,F1; A plane moving from south to north.  
18.04:(1);G2,F1; A plane.  
18.05:(2);G9,F10; A yellow light was observed in the mountainside,  
on the western part of Hersjøen. We took some  
pictures. But as it hadn't moved until 18.25,  
we thought it was a light from a cottage. A  
couple of times it seemed as it was flickering,  
otherwise it was stable. At 19.30 the light  
suddenly started to move out in the valley,  
direction north-east. Then we could see that  
there were two lights, placed very close to  
each-other. Shortly after, it changed  
direction, and moved straight towards us (in  
south). One of us tried to call up the  
headquarter on walkie-talkie (27MHz). Just a  
few seconds after that, the lights "burned  
out". The distance to the lights, when this  
happened, was about 600m to 1000m. The time  
elapsed from it started to move until it  
"burned out", was about 1 min. 30 sec.  
18.44:(1);G2,F1; A plane.  
19.13:(1);G2,F1; A plane.  
19.37:(1);G8,F1; A plane moving from north to south.  
20.23:(1);G8,F1; A plane moving towards south.  
23.02:(1);G8,F1; A plane moving towards north.  
23.37:(1);G8,F1; A plane moving towards north.

Saturday 18. February.

18.29:(2);G7,F2; Light in the mountain. Cottage(?)  
18.36:(1);G8,F1; A plane moving towards north.  
19.18:(1);G7,F5; A yellow-white light with a flash, moving  
towards north. Duration 2 minutes.  
19.21:(1);G7,F5; White flickering light moving towards north.

21.25:(2);G3,F1; A plane moving towards north.  
21.26:(1);G4,F5; A red light with a white flickering light,  
moving towards south.  
22.09:(3);G3,F1; A plane moving towards north, in west.  
22.45:(2);G8,F7; A strong white light, with a red light in front,  
moving towards north. 35 degrees over the  
mountain. It went out of sight after 3 minutes.  
22.48:(3);G8,F7; A red light and a strong white light moving  
towards north, in west. Low over the horizon.  
22.49:(1);G8,F7; A strong light with a red flickering light,  
LH3/21 moving towards north.  
22.51:(3);G8,F1; A plane moving towards south.  
22.53:(1);G8,F1; A plane moving towards south.

Monday 20. February.

05.17:(1);G8,F1; A plane with a white flickering light, moving  
towards south.  
18.12:(1);G7,F10; A strong red point moving around on the ground.  
18.25:(2);G3,F1; A plane moving towards south.  
18.30:(2);G7,F4; Two small red lights moving up the mountainside  
on Skarvan. They were three centimeters apart  
(at arm's length), moving exactly parallel.  
It took the lights 30 sec. to "climb up" the  
mountainside.  
18.41:(2);G2,F2; A small white light in the mountainside, in  
direction Fjellbekkhøgda.  
18.45:(2);G2,F2; A white light moving down the mountainside,  
in direction Rødhovde.  
19.22:(2);G5,F5; A yellow-orange light in the west, moving  
towards north.  
19.24:(8);G5,F5; A light moving towards north, just over Øyungen.  
19.58:(8);G8,F1; A plane moving towards south.  
20.07:(2);G7,F4; A light moving very fast towards north. 35  
degrees over the mountain, in west. Duration 3  
minutes.

20.08:(3);G7,F4; A light moving towards north. 60 degrees over the mountain, in west.

20.09:(3);G7,F4; Three flashes very high up, in the east.

20.09:(2);G7,F4; Some flashes straight up (90 degrees).

21.54:(3);G8,F1; A plane moving towards south.

22.21:(3);G8,F1; A plane moving towards south.

22.48:(3);G8,F1; A plane moving towards north.

Tuesday 21. February.

19.41:(3);G1,F2; A plane(?).

Wednesday 22. February.

18.38:(3);G6,F1; A plane moving towards north.

19.13:(3);G2,F1; A plane moving towards north.

20.13:(1);G3,F5; A red light moving towards north.

20.14:(1);G8,F1; A plane moving towards south.

20.15:(3);G8,F1; A plane moving towards south.

22.23:(1);G8,F1; A plane moving towards south.

Thursday 23. february.

09.43:(1);G9,F1; A mil.plane moving towards north-east.

09.50:(1);G8,F1; A mil.plane moving towards north.

10.04:(1);G9,F1; A mil.plane moving towards north-west.

10.08:(1);G8,F1; A plane moving towards south.

11.54:(1);G8,F1; A plane moving towards north.

12.11:(1);G8,F1; A plane moving towards north.

14.46:(1);G8,F1; A mil.plane moving towards north.

22.15:(1);G8,F1; A plane moving towards north.

22.19:(1);G8,F1; A plane moving towards south.

23.37:(1);G9,F1; A mil.plane moving towards north.

Saturday 25. February.

18.37:(1);G8,F1; A plane moving towards north.

20.06:(1);G3,F4; A flash just over Vårhuskjølen.

Sunday 26. february.

03.08:(2);G7,F5; First a flash, then a strong "spotlight" pointing at the observers. Then the spotlight was directed straight down. Thereafter the direction of the spotlight moved upwards, and moved back to the observers once more.

A2. Overview on some of the films.

In the summary of the reports, I have written down the corresponding films. Not all of these were successful. In this list, I will shortly mention what you can see on the films:

Lightst = A light that have made a line on the picture, because of long time of exposure.

Fi = Finnsånsgda  
FiN = Finnsånsgda north  
Li = Litlfjellet  
LiW = Litlfjellet west.  
LiE = Litlfjellet east.  
VaW = Vårhuskjølen west.

Film: LH1. Type: Tri-X. Time: 8.february to 15.february.

- 7 : A snowscooter by the cottage at Litlfjellet. 8.feb.
- 8 : Leif sitting in a sledge, 8.feb. at 14.00 o'clock.
- 9 : A spectral-picture of the moon (half-moon).
- 10: A spectral-picture of the moon.
- 11: Only to lights, that might be noise(?). Otherwise nothing.
- 12: A lightst over FiN.
- 13: A lightst over FiN, further north.
- 14: A lightst over Øggdalen.
- 15: A lightst over LiW.
- 16: A lightst over Li.
- 17: A lightst over LiE.
- 18: A picture of LiE, no lights is seen.
- 19: A lightst over VaW, with some weak flickering.
- 20: A lightst over FiS, with uneven(?) flickering.
- 21: A lightst over FiS, with flickering with uneven amplitude.
- 22: A lightst over Fi, with two strong flickering, and some weak.
- 23: A lightst over Fi, with flickering with even frequency and uneven amplitude.
- 24: A lightst over FiN, weak and no flashing.
- 25: A lightst over FiN, further north, now strong and no flashing.
- 26: A lightst over FiN, weaker towards the end (north).
- 27: A weak lightst over FiN/Øggdalen.
- 28: A weak lightst (or noise) over Øggdalen, and aurora.
- 29: No picture
- 30: Aurora with no reference.
- 31: Two weak lights over Va, or is it noise?
- 32: A weak light over Va. The picture is probably taken at dawn.

Film: LH2. Type: Tri-X. Time: 15.february to 17.february.

- 00: A light over FiN. There seem to be something black in the picture. Is it noise?
- 0 : Light over Øggdalen. There seem to be two black "things" in the picture. Is this also noise?
- 1 : Øggdalen. No lights
- 2 : Picture of Fi.
- 3 : Picture of FiN.
- 4 : A weak lightst over FiN.
- 5 : A weak lightst over FiN.
- 6 : A lightst over Øggdalen.
- 7 : A lightst over Li.
- 8 : A strong flickering light over VaW.
- 9 : A light just over the horizon of Fi. Noise?
- 10: A dobbel-flash high over Fi. Noise?
- 11: A weak lightst over FiN.
- 12: Øggdalen. No light is seem.
- 13: Litlfjellet. No light is seen.
- 14: Litlfjellet, and something which is long and black. Noise?
- 15: A lightst over LiE.
- 16: The station seen towards Rognefjell.
- 17: A dark "U" over Li. Noise?
- 18: A light without reference.
- 19: Nothing
- 20: The moon.
- 21: The moon.
- 22 ---: Nothing.

Film: LH3. Type: Tri-X Time: 19.february to 19.february.

- 0 : A snowscooter outside the cottage at Hersjøen.
- 1,2 : Four people inside the cottage at Hersjøen.
- 4 : A daylight-picture towards north-east of the station.
- 5 : A lightst over FiN.
- 6 : A strong lightst over Fi. Weak reference.
- 7 : A strong lightst over FiN. Weak reference.
- 8 : A strong lightst further north.
- 9 : A strong lightst over Øggdalen.
- 10: A strong lightst over Li. A strange movement in the middle.
- 11: A flickering light over FiS. Weak referense.
- 12: A double-flashing light over Fi. Weak referense.
- 13: A double-flashing light over FiN. Flash-Doubleflash-flash...
- 14: The same type of light further north.
- 15: Uneven flickering light far away.
- 16: Nothing.
- 17: Two strong lights in north.
- 18: One strong light in north, and two weak ones, which might be noise?

19,20: A spectral-picture of the moon, in east just above the horizon.  
21: A strong lightst over Fi. Uneven movement and flickering.

Film: APT1 Type: Tri-X Time: 24.january to 27.january.

0,1,2 : Pictures of the nature in Hessdalen.  
3 : Nothing.  
4 - 16 : Nothing.  
17: A small lightst. It should be Sirius.  
18: A strong light. Sirius.  
19 - 21: Nothing.  
22: A lightst. See a part of the specter.  $f=1.7$ ,  $t=4s$   
23: A lightst. See a part of the specter.  $f=1.7$ ,  $t=4s$   
24: A lightst. See a part of the specter.  $f=1.7$ ,  $t=4s$   
25: A light with strong specter; Sirius.  $f=1.7$ ,  $t=8s$   
26: A light with a little bit weaker specter.  $t=4s$   
27: A light with weak specter.  $t=2s$   
28: Only Sirius is seen.  $t=1s$   
29-33: Nothing.  
34-37: Daylight-pictures of the nature.

Film: ES1 Type: Tri-X Time: 21.january to 22.january.

0 : A daylight picture of the nature.  
1 : A short lightst over FiN. Good star-specter.  
2 : A weak lightst over Li. Good star-specter.  
3 : A weak lightst over LiE. Good star-specter.  
4 : A lightst with flashing over FiS. Weak star-specter.  
5,6 : Nothing.  
7 : A lightst with a strange movement over Va. The lights from the houses in Heesdalen and their specters is also seen.  
8 : A lightst with a strange movement and two flashes in the lightst. The lights from the houses and their specters is also seen.  
9 : Nothing.  
10: A lightst with a flash. Good star-specter.  
11: A double-lightst over Fi. First (in south) weak with flashes, then strong. Good star-specter.  
12: A double-lightst over FiN.  
13: A double-lightst over Øggdalen. Strong with flashing.  
14: A double-lightst over Li. The frequency of the flashing suddenly became bigger.  
15: Nothing.

16: Specter of the lights in Hessdalen.  
17: Specter of the moon.  
18: A strong light over Va.  
19: A lightst over Li. Much noise from other specters.  
20,21 : Daylight picture of the nature and the station.

Film: ES3 Type: Neopan 400

1 : A weak light over Fi.  
2 : A weak lightst over Fi.  
3 : A weak lightst with uneven amplitude. No reference.  
4-6 : A weak lightst. No reference.  
7 : Grey; nothing.  
8 : Nothing.  
9 : Two weak lightst over FiN.  
10,11 : Grey with some star specter.  
12--- Grey and nothing.

Film: RW1 Type: 2484

3 : A lightst with a slowly growing oscillation in one end.  
5 : A lightst  
13-17: A light moving horizontally in north-east. Good pictures.  
18 : Only nature. A ref. to picture 17.

Film: X Type: Tri-X

1 : A picture of Øggdalen. Unclear in the front.  
2 : A picture of Øggdalen. Unclear in the front. Two lights over Fi ?  
3 : A picture of Øggdalen. Unclear in back.  
4 : Two strong lightst with a strange movement over Fi.  
5 : A strong lightst with a strange movement over Fi. Taken from Hammerkneppen ?  
6 : A lightst over Fi. Strange movement.  
7 : A lightst over Øggdalen. Strange movement. One slight movement of the camera(?)  
8 : A lightst over Li. Strange movement.  
9 : A lightst over LiE. Strange movement.  
10: A lightst over Hammerkneppen in north. Strange movement.  
11: A weak lightst in north-east.  
12: A weak lightst in north-east. Fra away.  
13: A weak lightst in north-east. Far away.  
14: A long lightst in north-east. Strange movement.  
15: A lighst over FiN.

- 16: A lightst over Sggdalen.  
 17: Nothing.  
 18,19: A lightst without reference.  
 20: Higher order mode of the spectrum from the moon(?), over Va. The spectrum is horizontal.  
 21: A daylight-picture of the station, seen towards FiS.

Film: H001 Type: Tri-X Time: 11.february to 12.february.

- 1 : A light just on top of the mountain.  
 2 : A lightst with strange movement over the montain.  
 3 : A big area in the sky which is lighter.  
 4 : Nothing.  
 5,6,7 : A lightst with strange movement. No reference.  
 8 : A lightst over a tree.  
 9 : A picture of the mountain.  
 10-21: Pictures of some of the people in the project.

### A3. Registrations on seismograph.

During the project period, there were some recordings on the seismograph. These recordings were sent to the University of Bergen for analysis. They found out that all recordings came from seismological activity far from Hessdalen, even from other parts of the world.

We also took an overview of the recordings, and we could clearly read visuable recordings at these times: (No recordings from other times than during the project periode, are in this list)

- 01.feb. at 08.00 - a small recording  
 01.feb. at 15.42 - a small recording  
 12.feb. at 06.01 - a small recording  
 15.feb. at 11.57 to 12.00 - a small recording  
 16.feb. at 18.26 to 18.42 - a big recording  
 18.feb. at 00.14 - a very small recording  
 18.feb. at 00.15 - a very small recording  
 18.feb. at 00.34 to 00.37 - a small recording  
 18.feb. at 06.31 - a very small recording  
 22.feb. at 06.30 - a very small recording  
 23.feb. at 16.31 - a small recording  
 24.feb. at 13.59 to 14.03 - a medium recording

Recordings within a radius of 50km from Hessdalen:

YEAR	DATE	SOU	HR	M	SEC	LAT	LON	DEPTH	MB	ML
1887	JAN 22	KOL	4	27	0.0	63.200N	10.300E	0	2.2	MAC 0.0
1887	JAN 23	PEN	4	27	0.0	63.100N	10.500E	0	2.5	PEN 0.0
1900	FEB 8	BAT	21	15	0.0	63.300N	10.200E	0	3.5	MAC 0.0
1900	FEB 8	PEN	21	15	0.0	63.300N	10.200E	0	2.1	PEN 0.0
1910	MAY 13	BAT	1	24	0.0	62.900N	11.100E	0	2.2	MAC 0.0
1910	MAY 18	PEN	1	24	0.0	62.900N	11.100E	0	2.1	PEN 0.0
1953	JUN 19	BGM	0	0	0.0	62.920N	11.510E	0	3.7	MAC 0.0
1953	JUN 19	SEL	6	15	0.0	62.900N	11.700E	0	3.7	SEL 0.0
1964	MAR 28	BAT	3	10	0.0	62.600N	11.000E	0	0.0	0.0
1965	SEP 13	PEN	0	9	30.0	62.900N	11.300E	0	2.0	PEN 0.0
1968	JAN 10	PEN	6	57	29.0	63.000N	10.400E	0	3.0	PEN 0.0
1980	DEC 8	NAO	7	35	46.0	63.300N	10.600E	0	2.4	NAO 2.4 NAO
1982	MAY 7	NAO	21	12	6.0	63.100N	10.200E	0	0.0	NAO 1.5 NAO
1982	OCT 10	NAO	18	9	0.0	63.200N	10.400E	0	0.0	1.7 NAO

#### A4. Registrations on radar.

The radar we used, Atlas 2000, has the following specifications:

- Frequency: 9450 MHz, +-20 MHz.
- Puls peak: 3 KW.
- Puls frequency: 1 KHz, -duration: 0.1us, 0.5us.
- Rotationfrequency of the antenna: 25/min.
- Horizontal beamwidth: 3dB-point: 2.4 degrees.
- Sidelobe attenuation at 10 degrees: <25 dB.
- Vertical beamwidth: 18 degrees.
- Sidelobe attenuation: < 28 dB.
- Gain: 26 dB.

We registered all reflections that gave a strong point on the radarscreen, those times we watched the screen. No weak reflections were recorded. As you see in the list, we did many recordings that only were detected by radar. All that is discussed in the report.

First I list all the recordings, then I plot some of the reflections in some drawings. There are three recordings on a light together with radar reflection. These are written with bold letters.

**Sat. 21.jan. at 17.50:** One reflection in the Haltdalen valley in the north. Also seen as a light. We followed this light from south towards north. When it was in north, it suddenly moved straight down. Then it was detected by the radar.

Sun. 22.jan. at 04.27: Three reflections on three sweeps, east of the mountain Rognefjell.

Mon. 23.jan. at 17.42: One reflection in north.

Tue. 24.jan. at 19.18: Two reflections over Finnsåhøgda.

**Wed. 25.jan. at 17.32:** Two reflections over Finnsåhøgda. This was also seen by witness outside. This light had a waving movement.

**Fri. 27.jan. at 22.58:** Two reflections over Finnsåhøgda. This was also seen by witness outside. The light moved from south to north. It moved very fast. On the radar we measured a minimum speed of about 8488 m/s.

Sat. 28.jan. at 15.49: Five reflections on four sweeps, very near the station in a south-west direction. The three first ones on three sweeps, were big. The two last one came on one sweep. It seemed as if the reflection had split into two smaller. They all seemed to follow a course.

Sun. 29.jan. at 16.10: Four reflections on four sweeps, very

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near the station in north-east. First a very big one, then smaller and smaller. They seemed to follow a straight course.

Tue. 31.jan. at 19.01: Three reflections on three sweeps, moving on a course from Rognefjell to Vårhuskjølen.

Wed. 1. feb. at 15.49: Three reflections on three sweeps, following a course from Vårhuskjølen towards Aspåskjølen.

Thu. 2. feb. at 14.05: Three reflections on three sweeps, east of the station.

at 14.35: Five reflection on seven sweeps, in north. First two reflections on two sweeps, then three reflections on every second sweep.

at 15.46: Two on two sweeps, south and near the station.

at 15.49: One west and near the station.

at 15.51: One south-west and near the station.

at 16.03: Two on two sweeps, north and near the station.

Fri. 3. feb. at 15.12, 16.09, 16.13, 16.41, 16.42, 16.43, 16.43 16.51 16.52 and 17.04.

Sat. 4. feb. at 13.42, 13.44, 14.03, 14.21, 14.27, 14.29, 18.06 and 19.41

Sun. 5. feb. at 13.09: Six on six sweeps, following a course from Rognefjell towards south-west of the station.

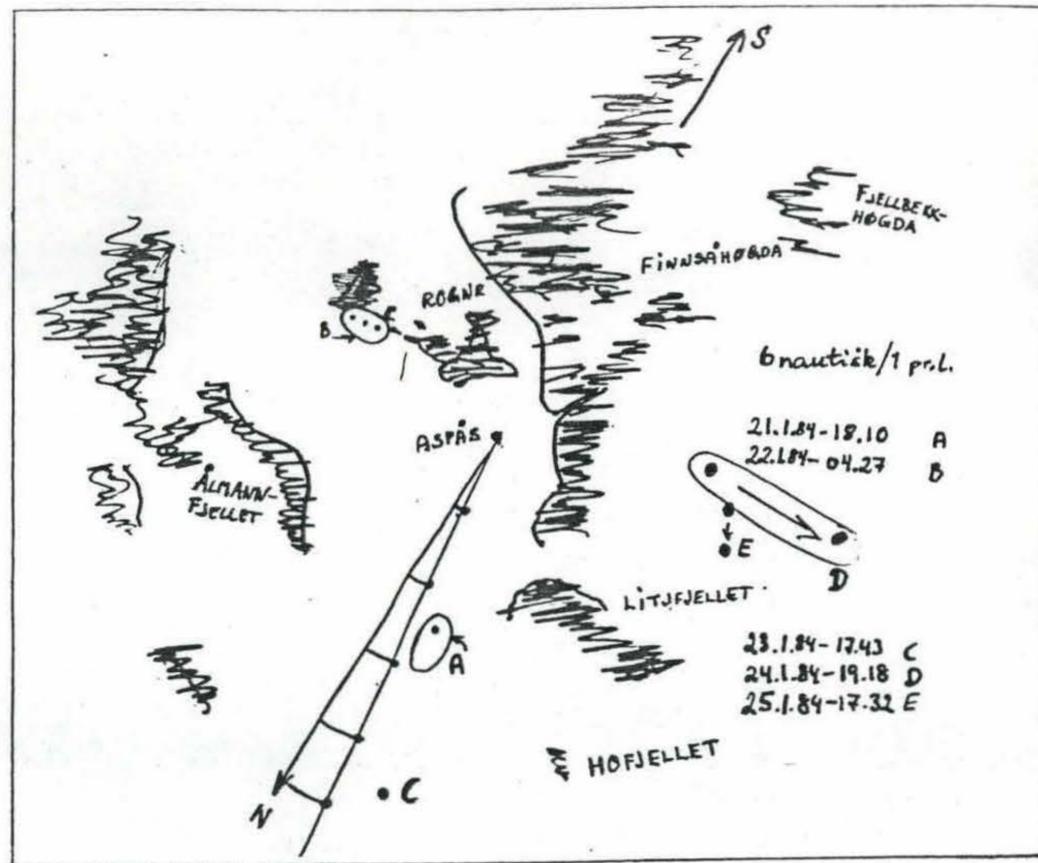
Mon. 6. feb. at 14.13: Eight reflections on eight sweeps, moving in a south-east direction, east of the station.

at 21.41: One near and south-east of the station.

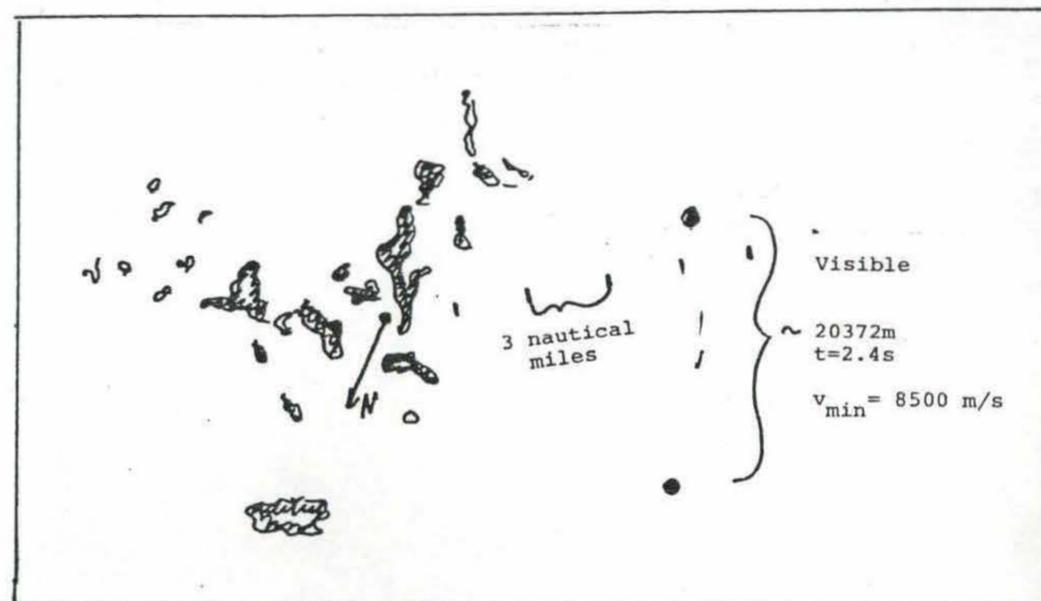
Fri. 17.feb. at 19.18: One near Finnsåhøgda.

In the following pages, you will find drawings of the radarscreen showing some of the reflections mentioned in the list.

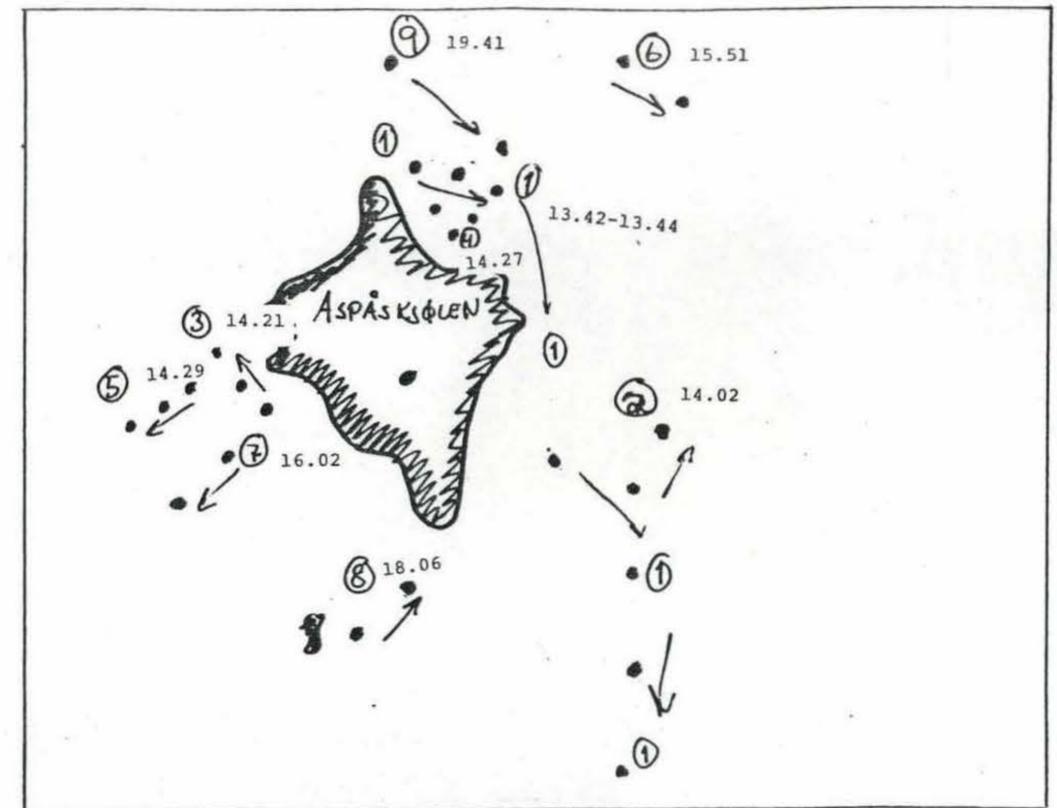
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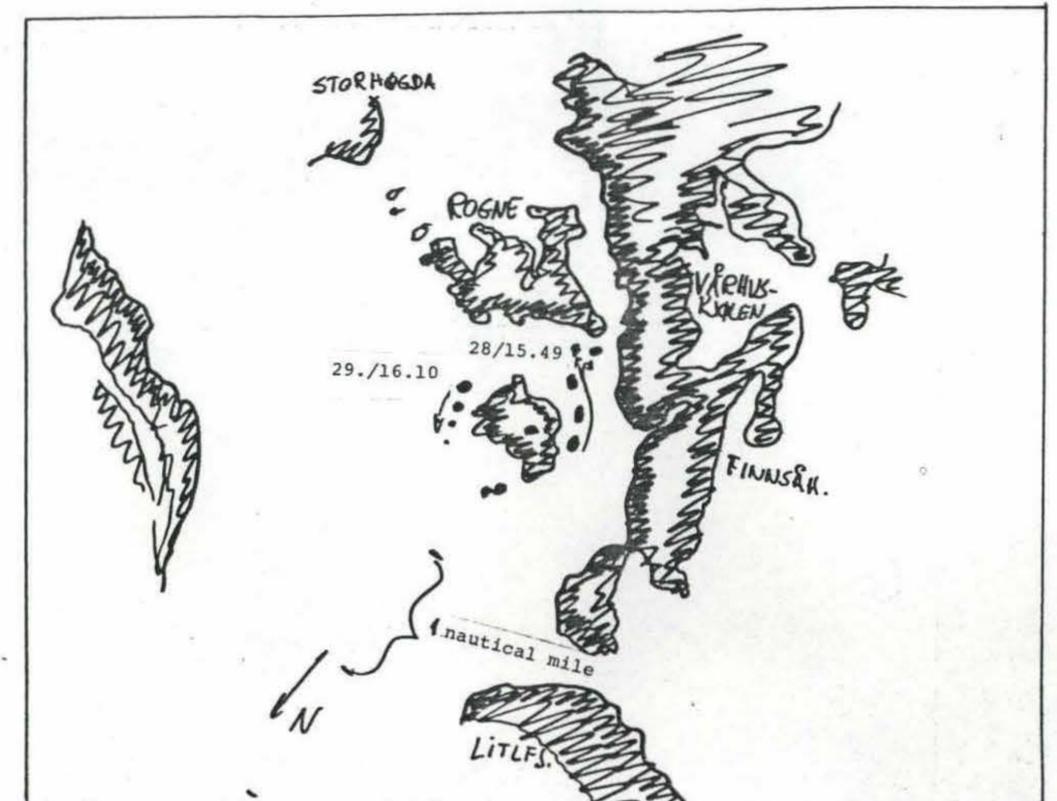
Radar recordings between 21. January and 25. January.



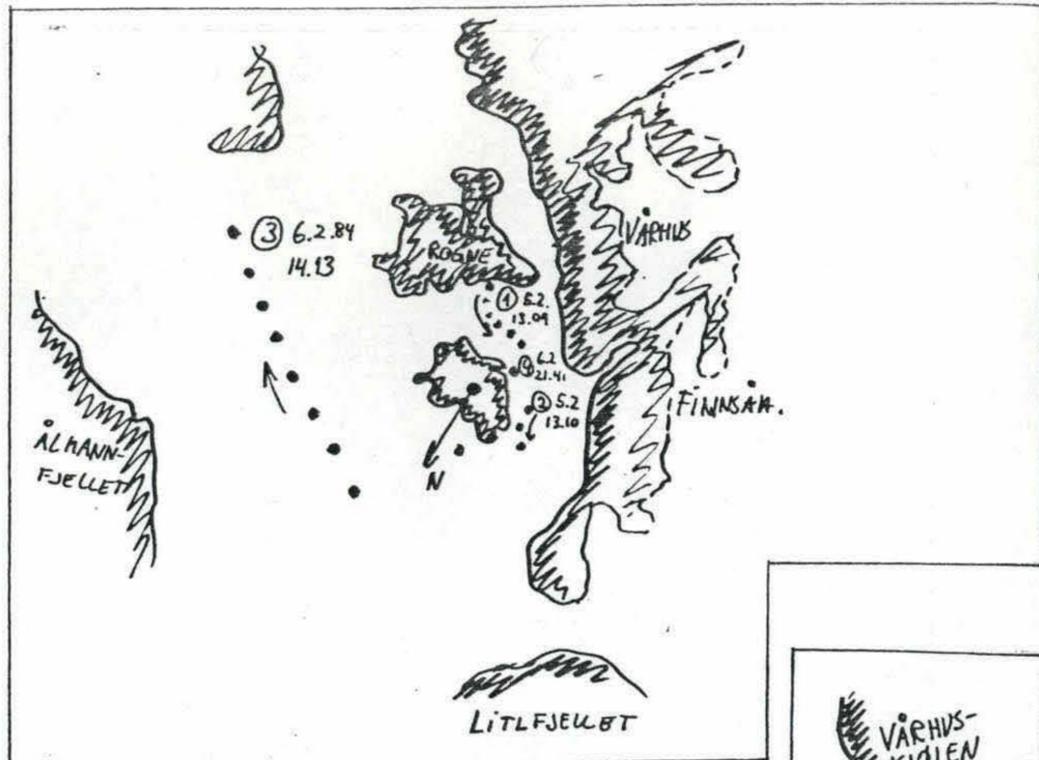
Radar recordings friday 27. January.



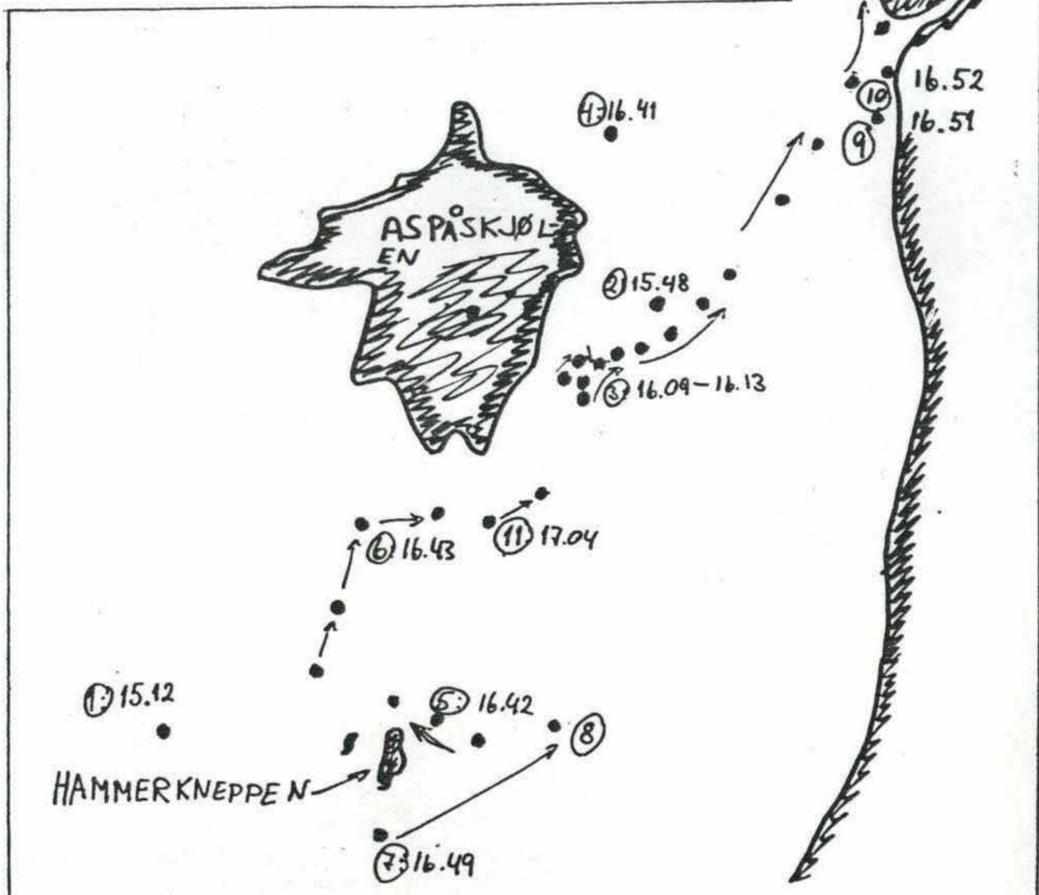
Radar recordings saturday 4. February.



Radar recordings saturday 28. January and sunday 29. January.



Radar recordings sunday 5. February and monday 6. February.



Radar recordings friday 3. February.

A5. Registration on spectrum analyser.

We had some registration on spektrum analyser. They can be split into two main categories. One of these can easily be explained as a radio transmitter in the valley. It was a single frequency-component. I include these registrations in the list, because we have not localized this transmitter. The source is therefore unknown. The frequencies were always different. This type of registration is called (1).

The second type of registration is called (2). This one was more strange. It was "spikes" with almost equal amplitude, with 80 MHz between each, all over the frequency-band, from 100 KHz to 1250 MHz. The amplitude of these moved up and down. When they were down, they were about 5 dB over the noise, and when they were at the top, they were about 25 - 30 dB over the noise.

Sun. 29. jan. from 19.25 to 19.33: A type (2) registration. It moved up and down all the time.

Sun. 29. jan. at 21.38: A type (2) registration. Only for a short time.

Tue. 31. jan. from 15.42 to 15.44: A type (2) registration. Now periodic. It lasted a few seconds, then it stopped for a short time, started again and lasted for a few seconds.. and so on.

Tue. 31. jan. at 16.42: A type (2) registration. Again periodic, but now the total time was almost one minute.

Fri. 3. feb. at 16.44: A type (2) registration. Only a short time.  
 18.08: -----"  
 19.51: -----"  
 19.52: -----"  
 19.55: -----"  
 20.01: -----"

Thu. 9. feb. at 19.36: A type (1) registration at 145 MHz. A "spike" moved up and down twice.

Thu. 9. feb. at 20.04: A type (1) registration at 130 MHz. A "spike" showed up twice. 3 sec. between each.

Fri. 17. feb. at 17.49: A type (1) registration at 1070 MHz. A "spike" showed up two times. The amplitude was 22.5 dB over the noise level.

Sun. 19. feb. at 20.59: A type (1) registration at 1115 MHz. The amplitude was 12.5 dB over the noise level.

#### A6. Registrations on magnetograph.

The magnetograph we used, Fluxgate magnetometer, model FM100, has an upper frequency of 0.5 Hz. Any magnetical fluctuations, with a frequency higher than 0,5 Hz, will be suppressed. The instrument is build to register slow-varying magnetical fluctuations. The pulsations, might have a higher frequency than 0.5Hz, typical 2 Hz. They are usually recorded with a special instrument: Pulsation magnetometer. We didn't have this instrument, therefore we can't be shure to have recorded all pulsations. The pulsations included in this list are those that could clearly be read out of the recordings.

We have not found any simple correlation with the slow-varying magnetical fluctuations, that is why no copy of the recordings (which is several meters long) is included in the report.

In the list, there is first the approximate time, then on which coordinate it is recorded. At the end it indicates the approximate amplitude of the pulsation. This have to be approximate, because we don't know the exactly frequency of the pulsation. If the frequency is 2 Hz, and the suppression is 20dB/decade in the instrument, this pulsation will be suppressed about 14dB.

The readings are divided in three types: Strong, medium and weak.  
- Strong is a reading of about 10 gamma.  
- Medium is a reading of about 2 gamma.  
- Weak is a reading of about 0.5 gamma.

The actual amplitude might be higher than this, because of the suppressing in the instrument. The instrument could record the magnetical field in all three coordinates. We had a writer that only had two channels. We choosed channel X (towards north) and Y (towards east).

From saturday 11. feb. at 16.12, to sunday 12. feb. at 12.20.

16.16-16.17  
17.51-17.54 on X and Y - strong  
18.00-18.03 X - weak  
18.40-18.42 on X and Y - medium  
18.45-18.46 X - weak  
19.23-19.25 Y - strong  
19.55-19.57 Y - strong  
20.45-20.48 Y - weak

21.04-21.06 X (and Y?) - very strong  
21.09- a few seconds, X and Y - both strong, X strongest.  
21.10-21.11 X and Y - both strong, X strongest.  
21.14 and 21.15 both times a few seconds, X and Y - both strong.  
21.18 - 21.20 X - weak  
21.28 - 21.30 X - medium  
21.56 - 22.00 X - weak  
22.20 - a few seconds, X and Y - strong.  
22.32 - some seconds (30), X and Y - strong.  
22.48 - some seconds, X and Y - strong.  
00.08 - 00.10 Y - weak.  
00.27 - 00.30 X - weak.  
01.35 - 01.42 X - weak.

After this quite a few ones were observed. Some of them were hard to note, while four were a little stronger than the others.

From sunday 12. feb. 15.32 until monday 13. feb. 10.07.

17.51 - 17.53 X - medium  
18.17 - 18.20 X - medium  
18.50 - 18.51 X - weak  
19.36 - 19.39 X - medium  
19.55 - 20.07 Y - weak  
20.41 - 20.44 X - weak  
21.41 - 21.49 Y - weak  
22.48 - 22.50 Y - weak

After that a magnetical storm came up, and it was therefore difficult to read the pulsations. Besides, during a storm there will usually be many pulsations. The storm vanished at 6 o'clock on monday 13. After that we can see pulsations at:

08.53 - 09.00 X - weak  
09.37 - 09.48 Y - weak

From monday 13. feb.10.07 until tuesday 14. feb.03.02.

11.02 - 11.05 X and Y - weak  
11.27 - 11.31 Y - weak  
12.14 - 12.17 Y - medium  
12.36 - 12.38 Y - weak  
15.45 - 15.47 X - weak  
17.05 - 17.07 Y - weak  
18.13 - 18.14 Y - weak  
After that a magnetical storm came up. It ended 19.50  
20.12 - 20.13 X - weak

20.21 - 20.24 Y - weak  
 No more pulsations until a second storm started at 01.00.

From tuesday 14. feb.03.07 until wednesday 15. feb.11.31

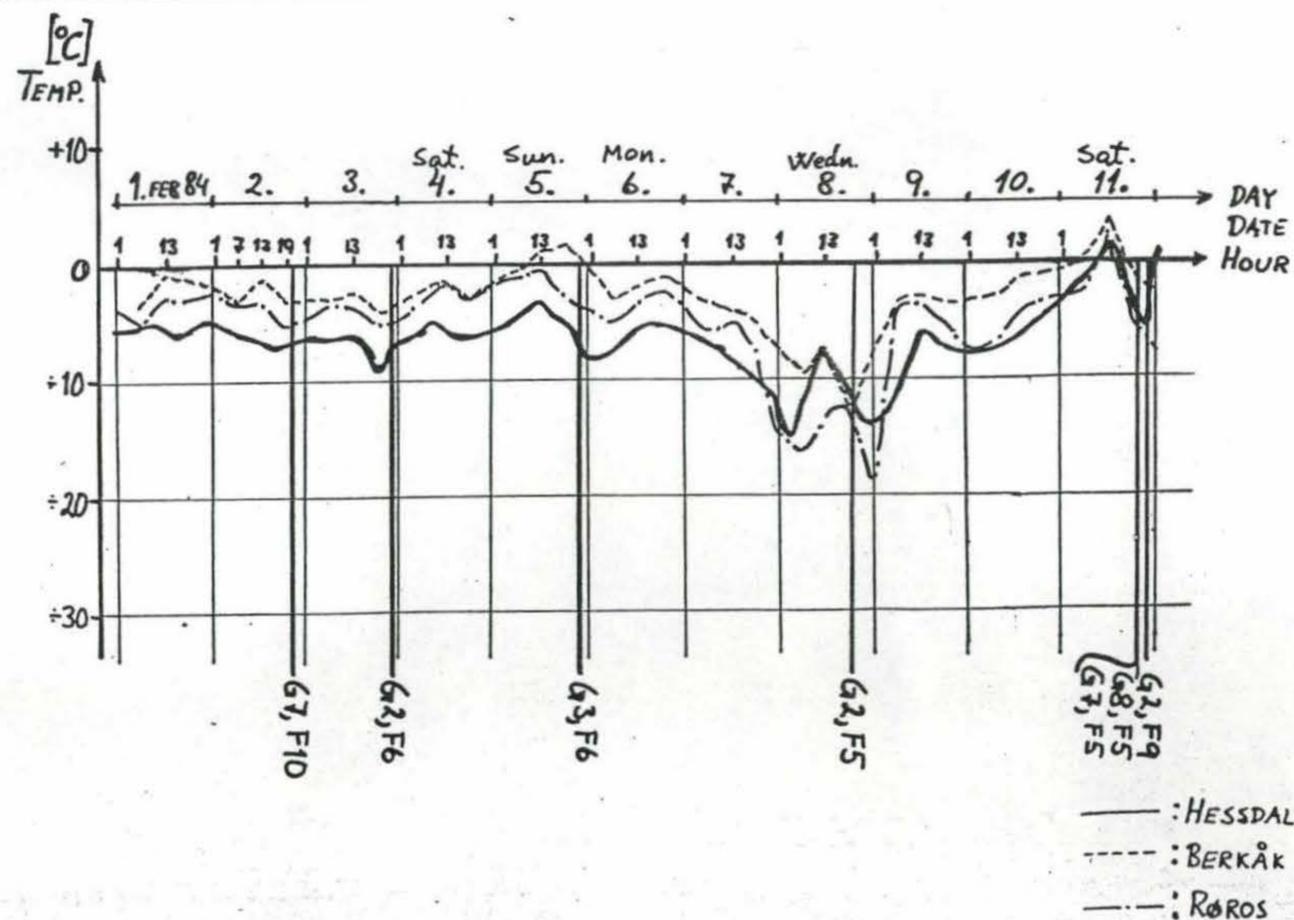
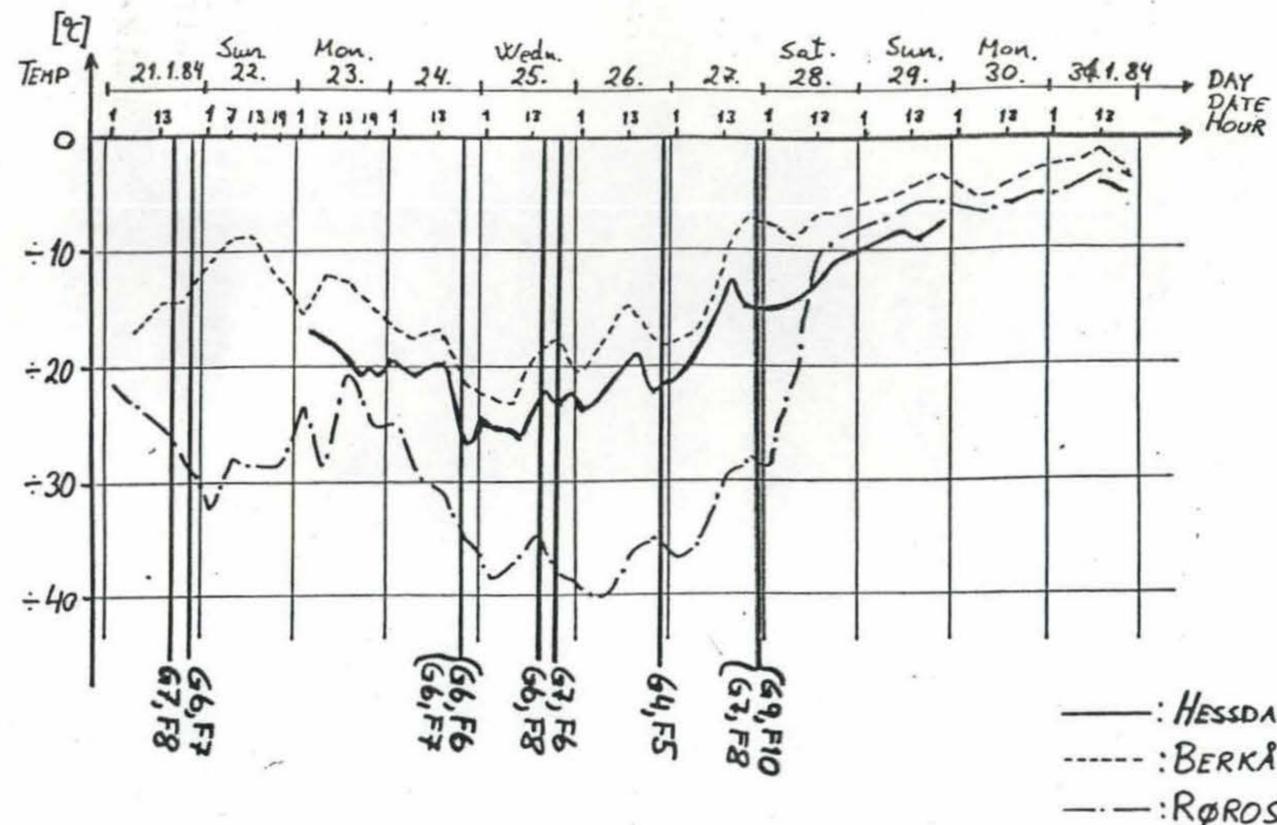
The storm ended at 11.00 o'clock.

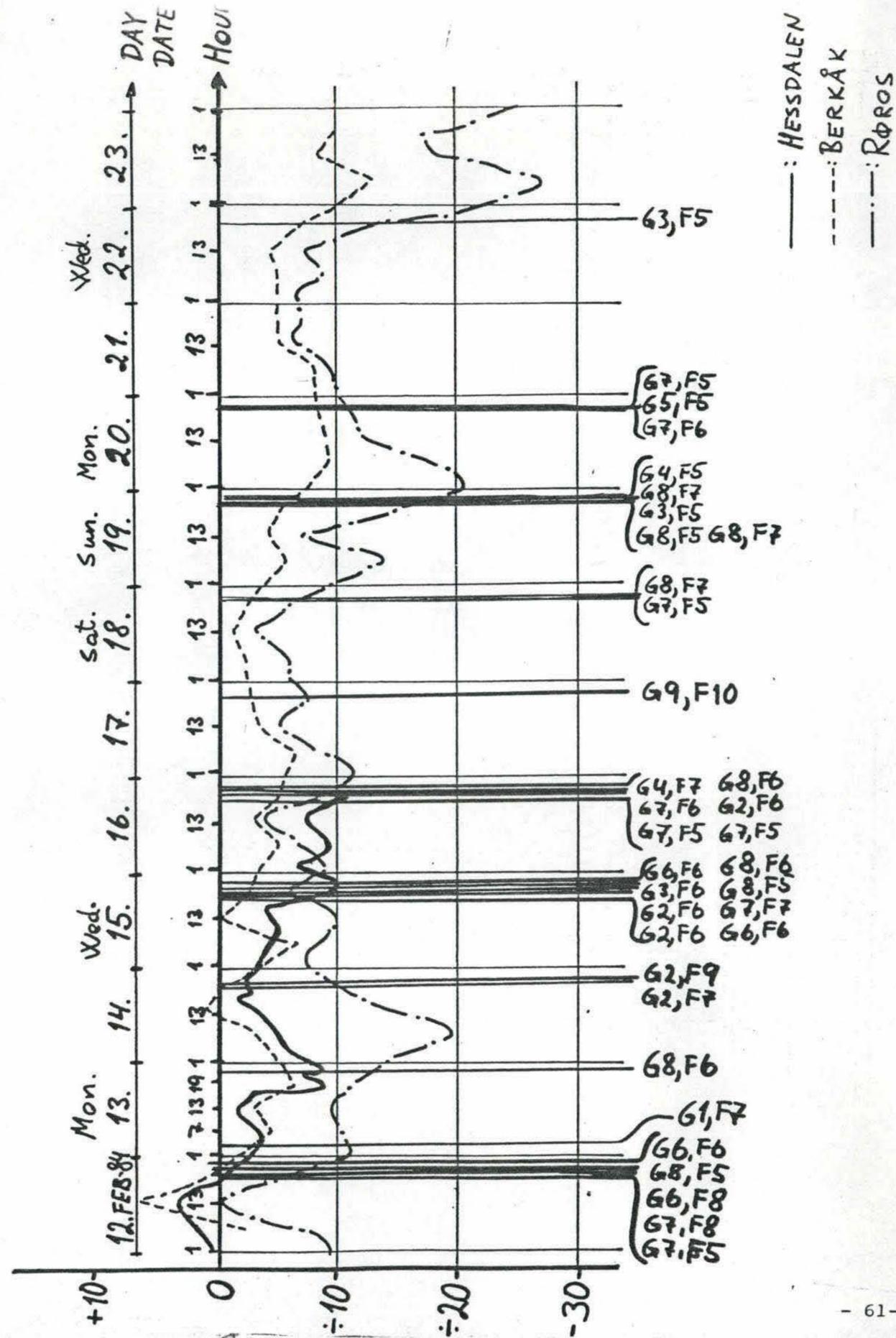
14.52 - 14.54 X - medium  
 15.38 - 15.39 X - weak  
 16.49 - 16.55 Y - medium  
 17.14 - 17.16 X - medium  
 17.55 - 17.59 Y - medium  
 18.36 - 18.39 Y - weak  
 19.15 - 19.17 X - medium  
 20.18 - 20.21 X - medium  
 20.24 - 20.34 Y - weak  
 22.24 - 22.29 Y - weak  
 A storm between 23.55 and 0.53  
 01.32 - 01.33 Y - weak  
 03.03 - 03.06 Y - weak  
 04.11 - 04.13 Y - weak  
 06.21 - 06.30 Y - weak  
 10.32 - 10.48 X - medium

During the periode from 15. february until 26. february, the recordings were made by the Esterline-Angus graphic Ampmeter. That means that no fluctations could be measured. A few times during that period, the needle made a fast movement. This happened also a couple of times when a light was seen. Whether this fast movement was caused by a pulsation or not, is difficult to say.

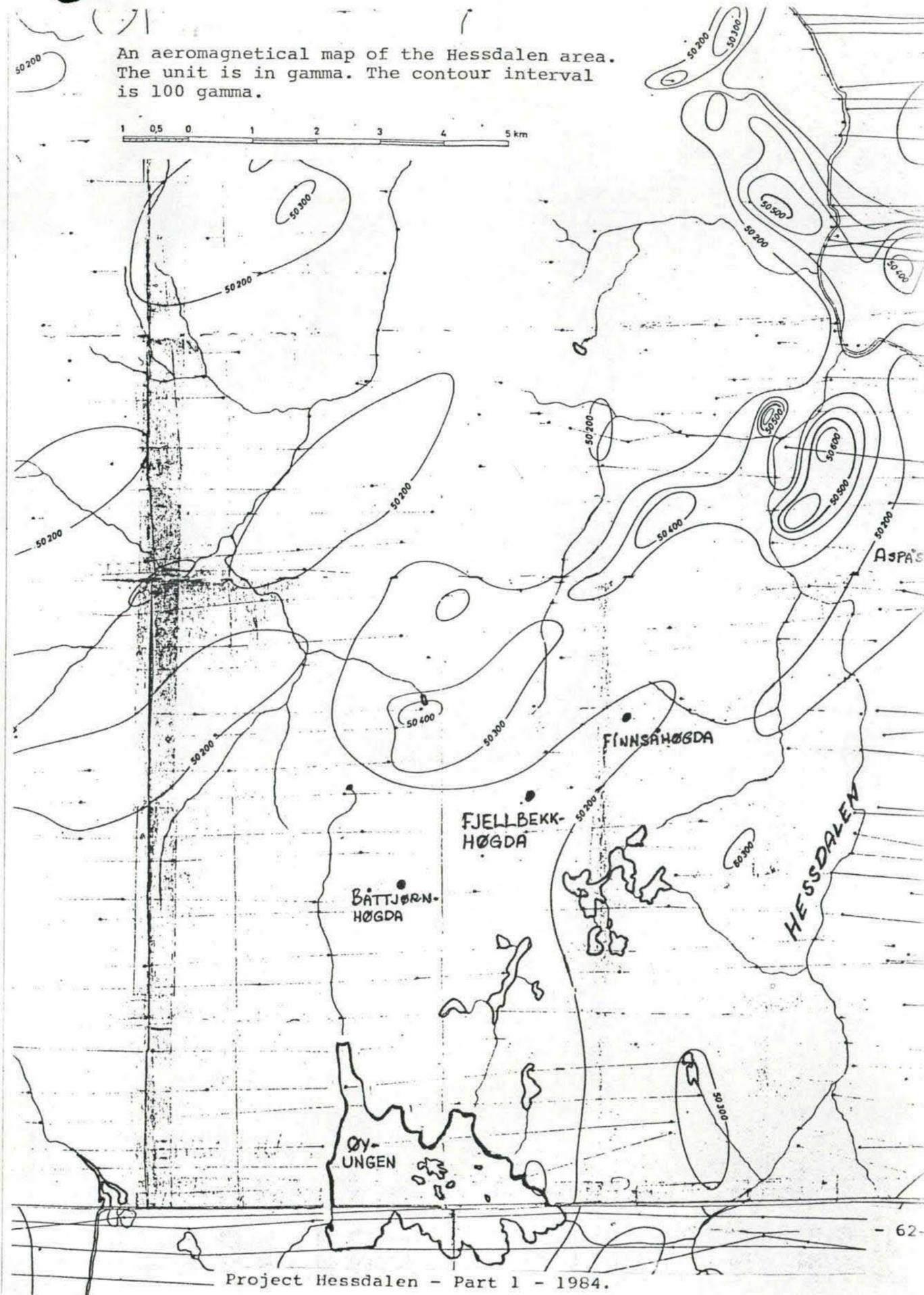
From saturday 25.febr. at 17.30 until sunday 26. febr. at 11.31.

17.54 - 17.58 X - medium  
 19.10 - 19.30 X - medium  
 23.06 - 23.07 X and Y - weak  
 23.20 - 23.24 X - weak  
 01.28 - 01.32 X - medium  
 02.34 - 02.48 Y - medium  
 03.32 - 04.02 X - medium  
 04.20 - 05.02 X - medium, 04.30 - 04.34 Y - medium.  
 08.14 - 08.26 Y - medium  
 08.34 - 09.26 Y - medium





Project Hessdalen - Part 1 - 1984.



Project Hessdalen - Part 1 - 1984.

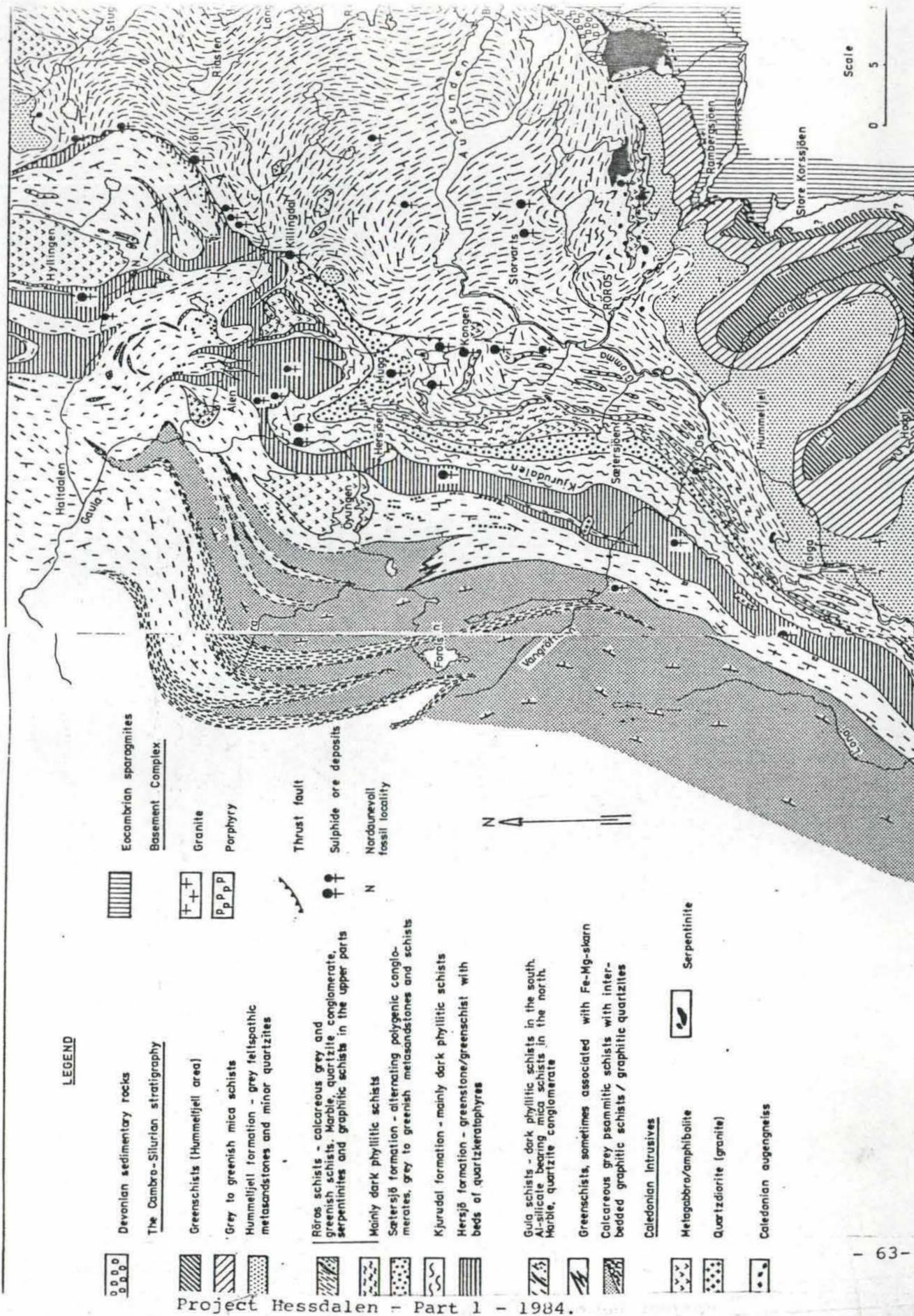


Fig.A1 - Photo taken by Arne P. Thomassen 25. October 1982. It is taken from Fjellbekkhøgda towards east.

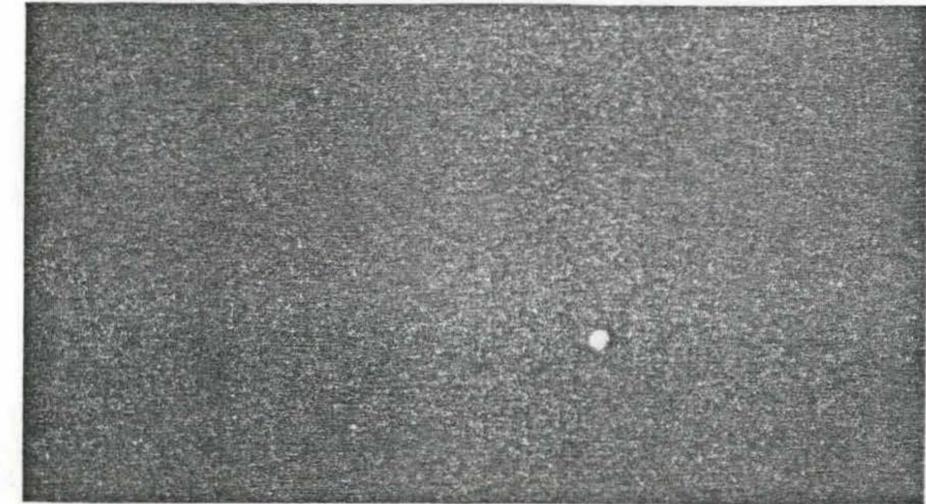


Fig.A2 - Photo taken by Arne P. Thomassen 25. September 1982, between 19.00 and 20.30. It is taken with a 400mm lens in front, from Fjellbekkhøgda towards east.



Fig.A3 - Photo taken by Arne P. Thomassen in October 1982. It is taken from Fjellbekkhøgda towards east.



Fig.A4,A5 - These two pictures is taken by Leif Havik 12. February at 17.53 (5.53pm). They are taken from Litlfjellet towards Hessdalen. In the upper picture can you see the norther part of Aspåskjølen. The light moved towards Litlfjellet, followed the valley to the left. The lower picture is taken just before the light dissapper behind the mountain in the eastern part of Litlfjellet. He used a Nikon FG/50mm.

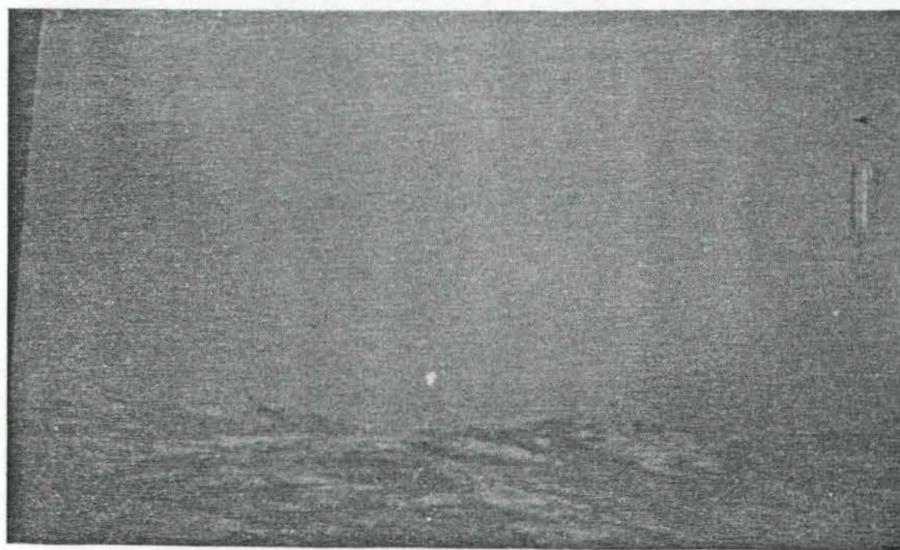


Fig.A6 - Photo taken by Arne P.Thomassen at 25. September at 19.00. It is taken from Fjellbekkhøgda towards east.



Fig.A7 - Photo showing the third category; three lights together. The light at the right is red, and the two others is yellow-white. Leif Havik shot the picture 18. Mars 1982, at 19.33 (7.33pm). He used a practica LTL-3 135x2.

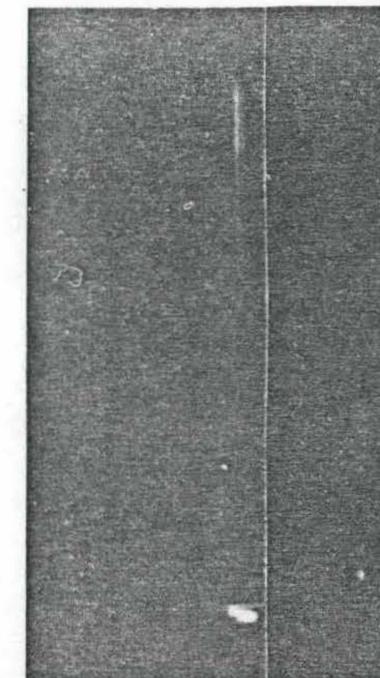
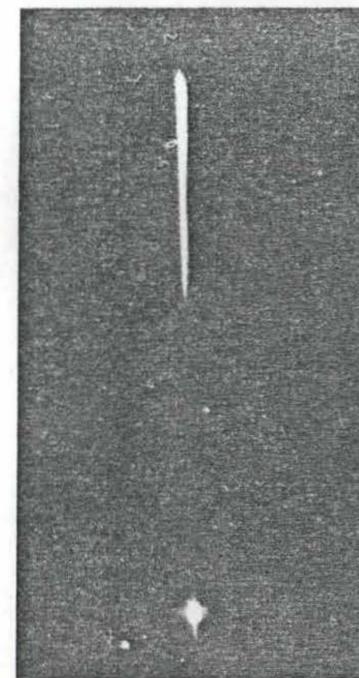


Fig.A8 - Two photos taken by Bjørn Lagesson sunday 26. February at 3.08am. They are taken with a grating in front. The lightstreak you see over the "lightpoint", is the spectrum of the light. The shortest wavelengt is nearest the light. The picture at the left is taken a few seconds before the picture at the right. The report has got a F5.

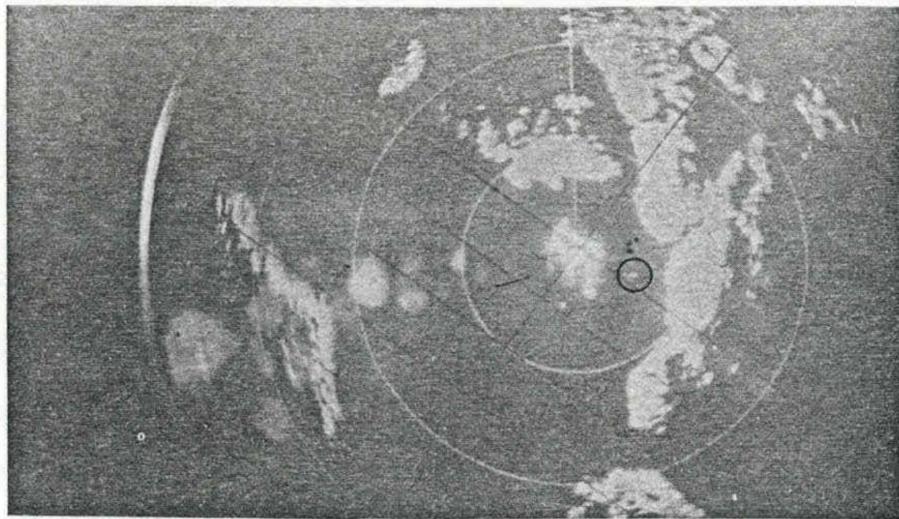


Fig.A9,A10 - Two photos showing an reflection on the radarscreen.  
The reflection is marked. It is 1 nautical mile  
between the circles

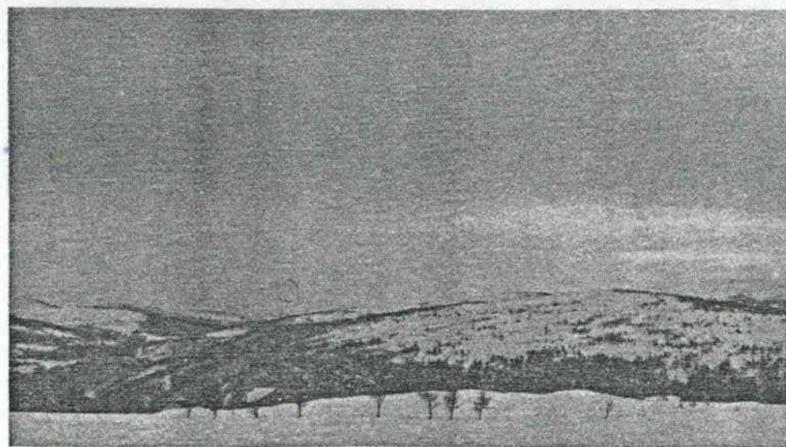
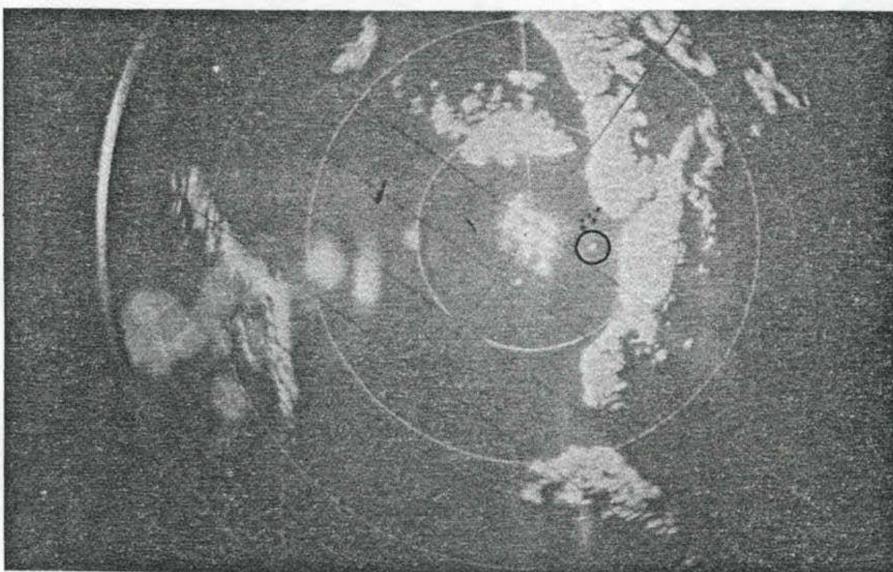


Fig.A11 - Picture taken from the headquarter towards  
Vårhuskjølen at 28.January at 15.49 (3.49pm). The  
picture is taken when a strong reflection is seen on  
the radarscreen. As you see, nothing special is seen  
in the picture.

Project Hessedalen - Part 1 - 1984.

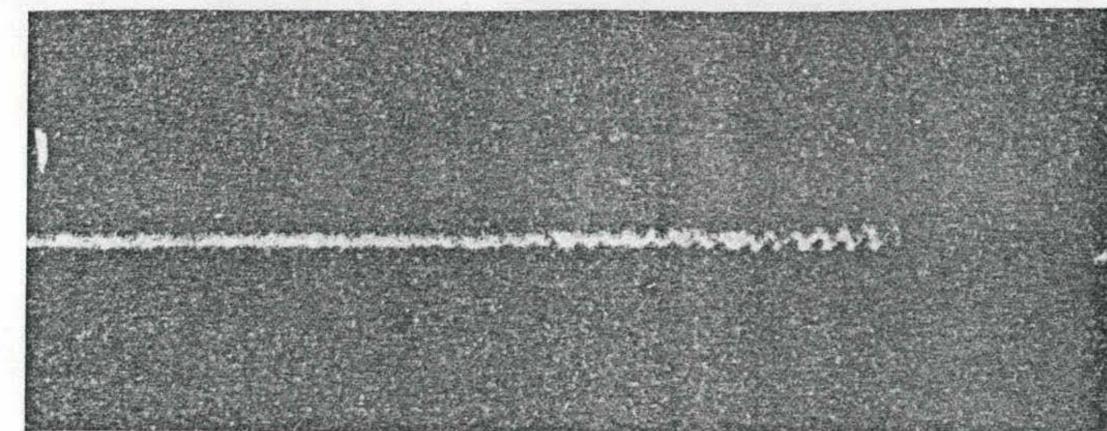
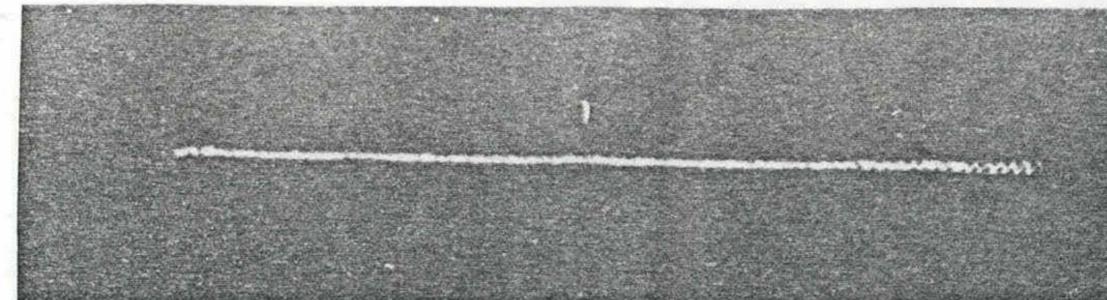


Fig.A12 - Photo taken by Roar Wister (RW1/3) saturday 21.  
February at 19.23. Exposure time is 10 seconds. The  
aperture is 5.6. It is taken by a Pentax ME Super with  
a Vivitar zoom 75 - 205mm which was adjusted to 75mm.  
Just after the picture was taken, an oscillation could  
be seen by the eyes. Probably the same oscillation  
which you see the start of in the picture. The  
frequency is 7 Hz.

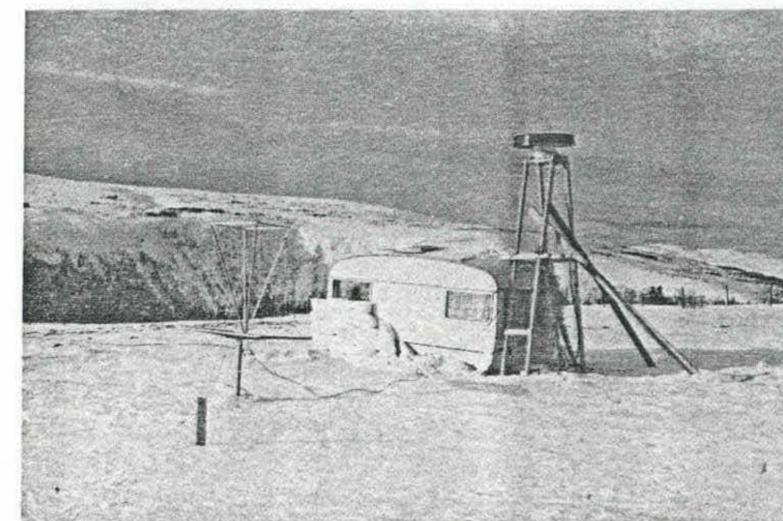


Fig.A14 The headquarter at Aspåskjølen. Seen from south east.

Project Hessedalen - Part 1 - 1984.

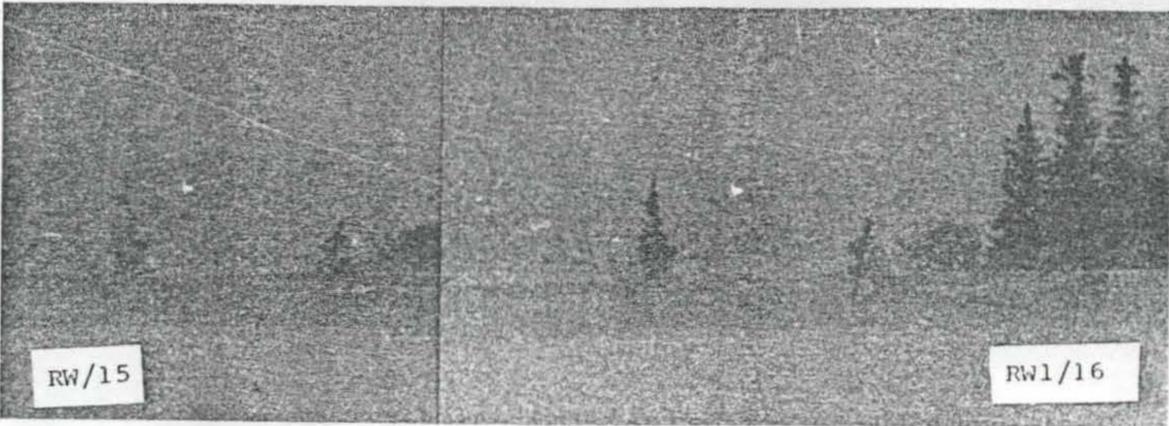
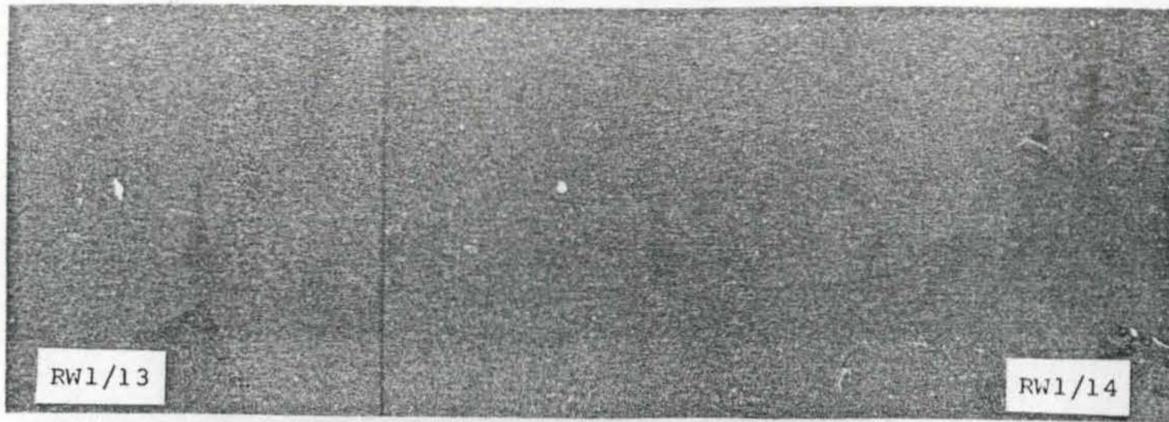
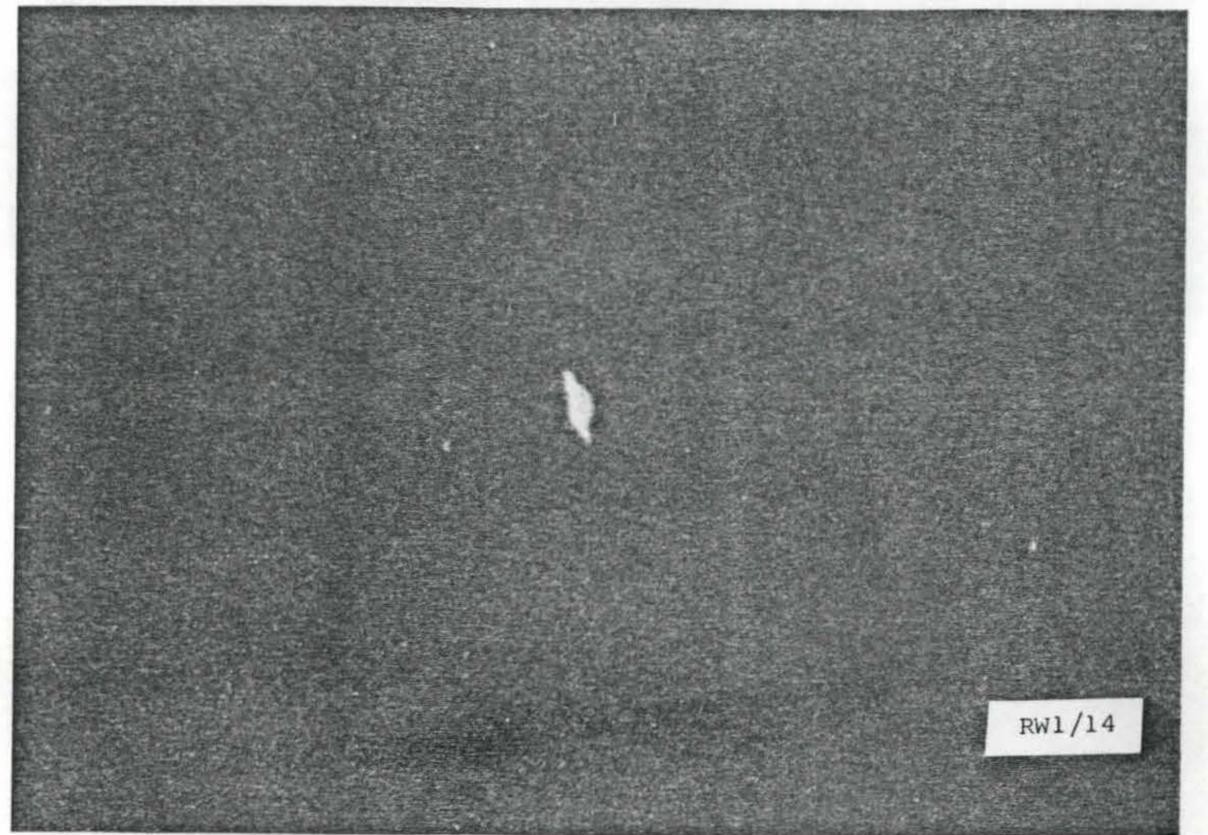
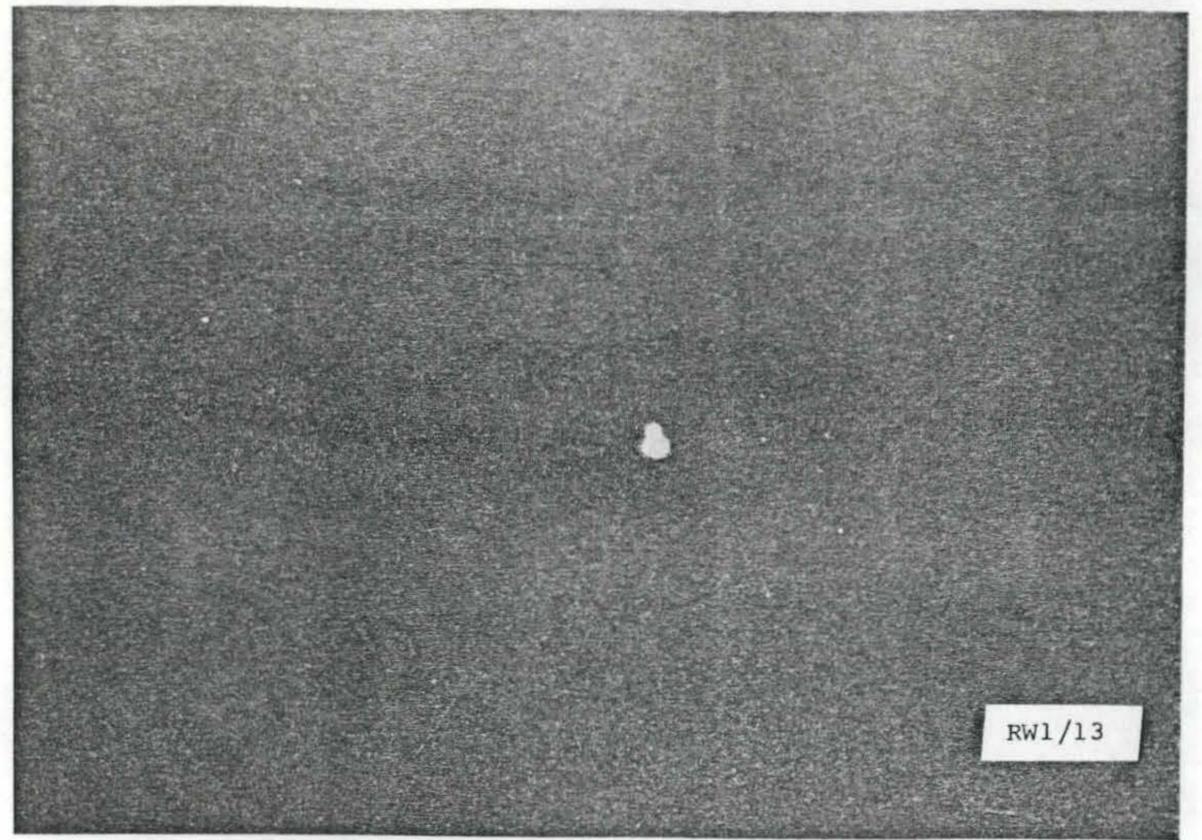
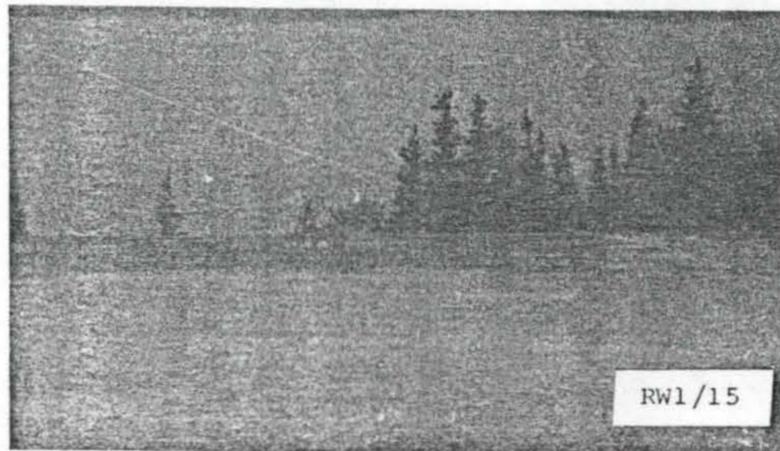


Fig.A15 to A19 - Photos taken by Roar Wister saturday 18.  
February at 20.18 (8.18pm), (RW1/13-17).  
Pictures taken in east northeast direction.  
Duration 2 minutes.



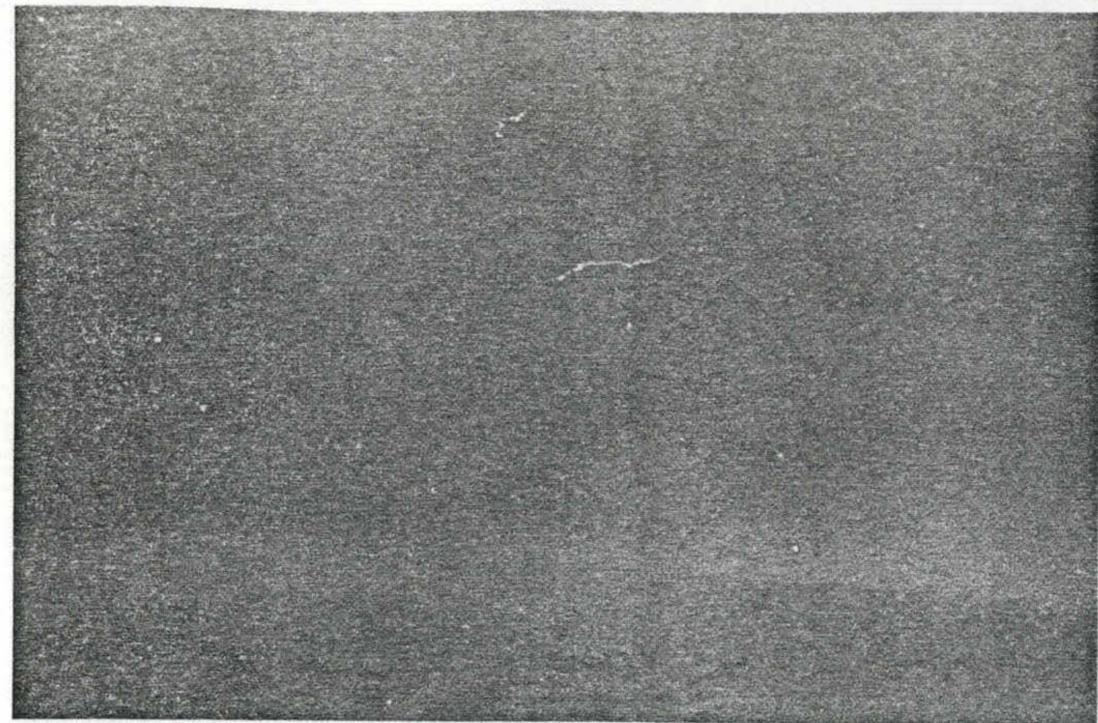
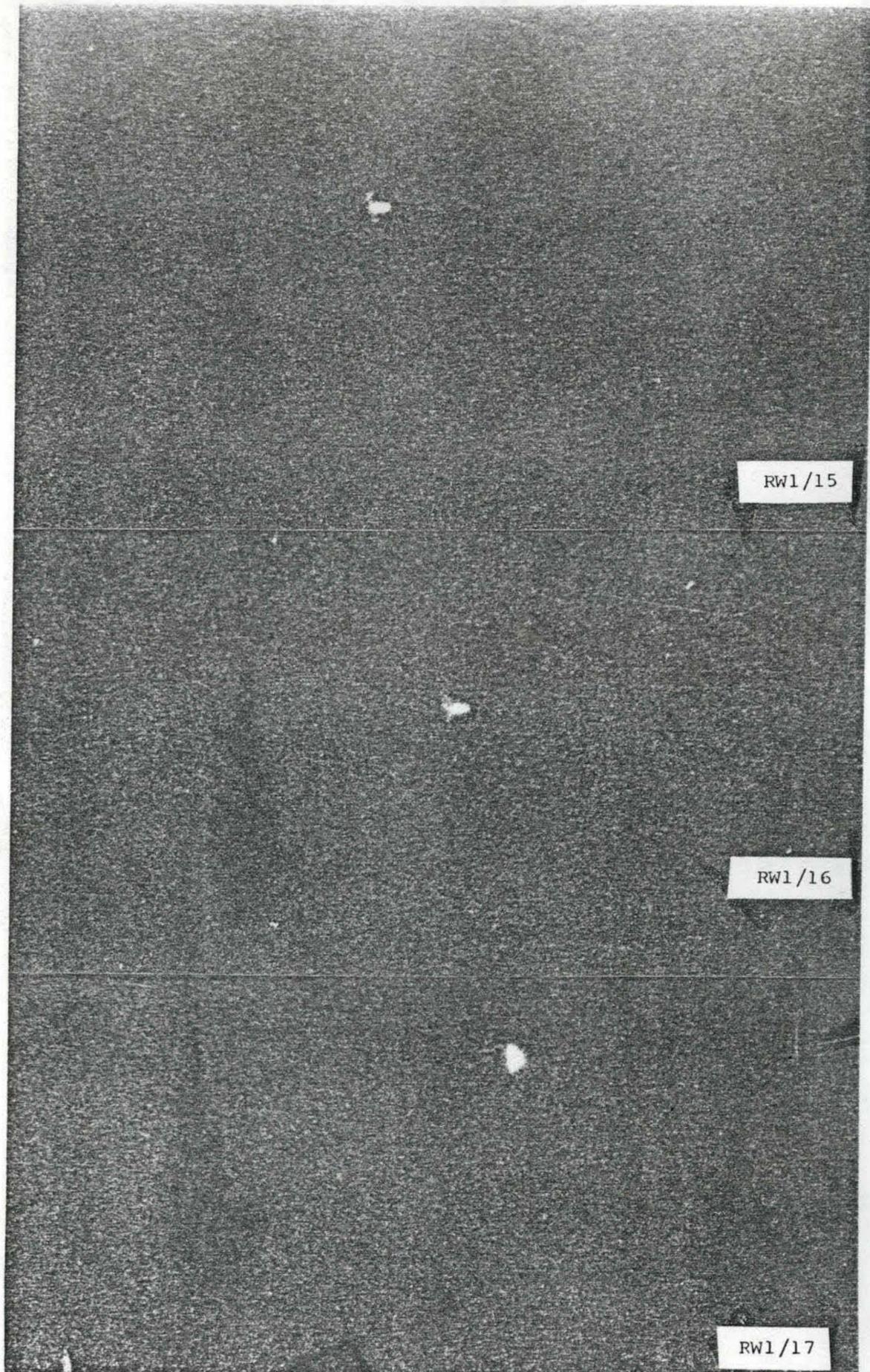
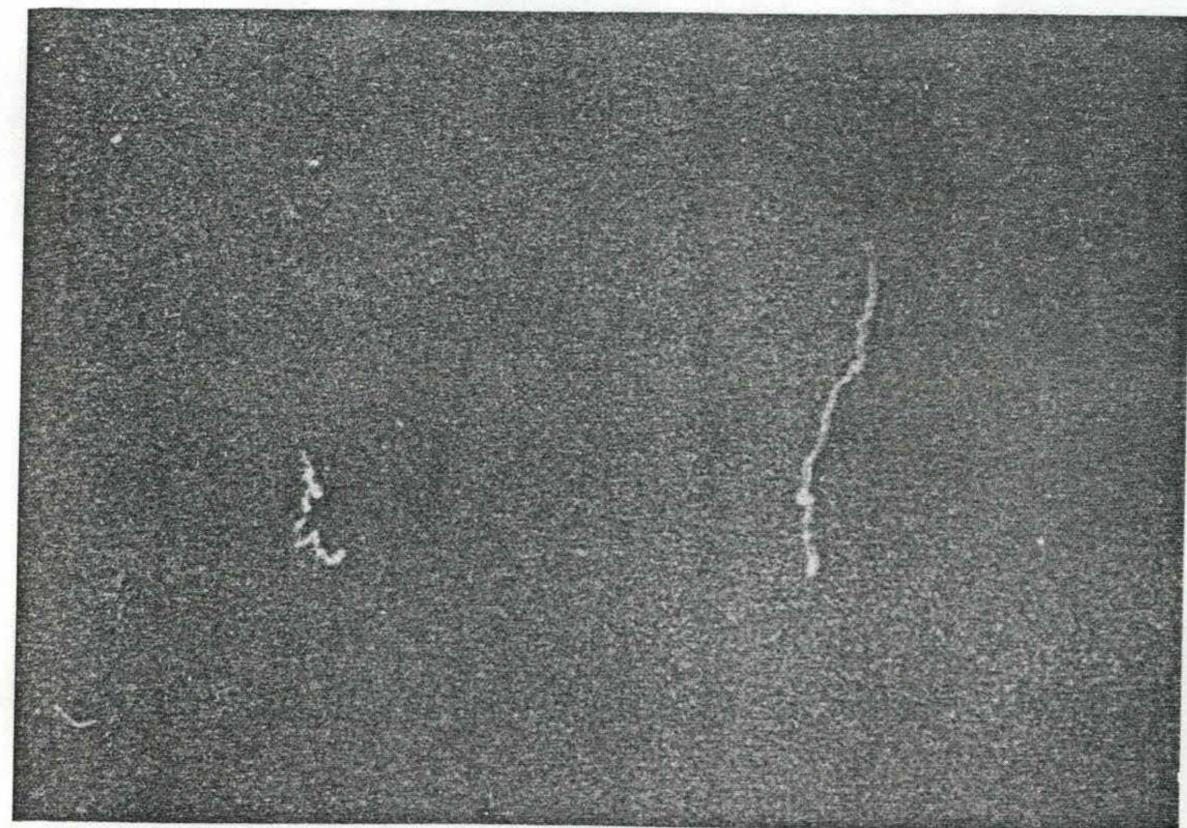


Fig.A20 - Photo showing two moving lights over Finnsåhøgda (X/4).  
The picture above is enlarged. The picture below is grossly enlarged.



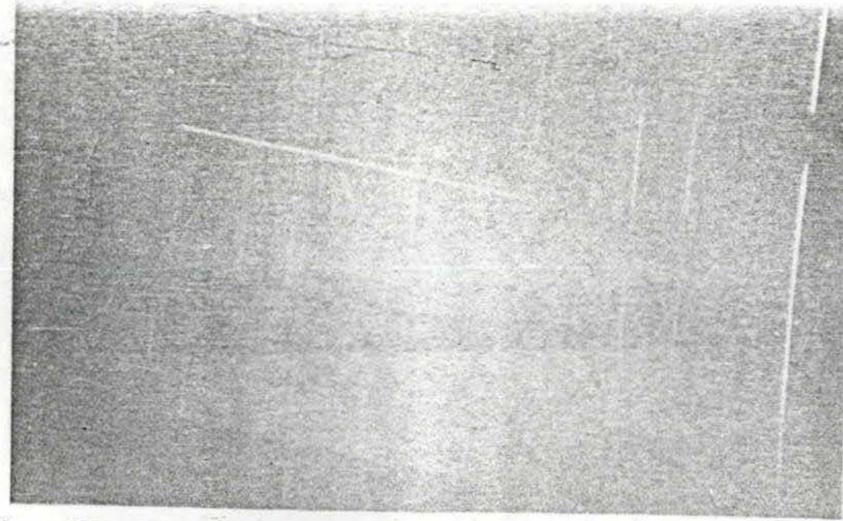


Fig.A21 - Photo taken by Erling Strand (ES1/13) saturday 21. January between 19.20 and 19.30.

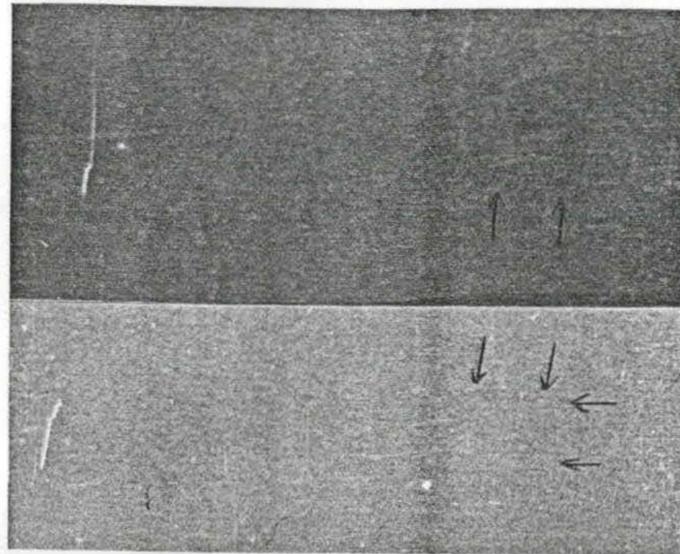
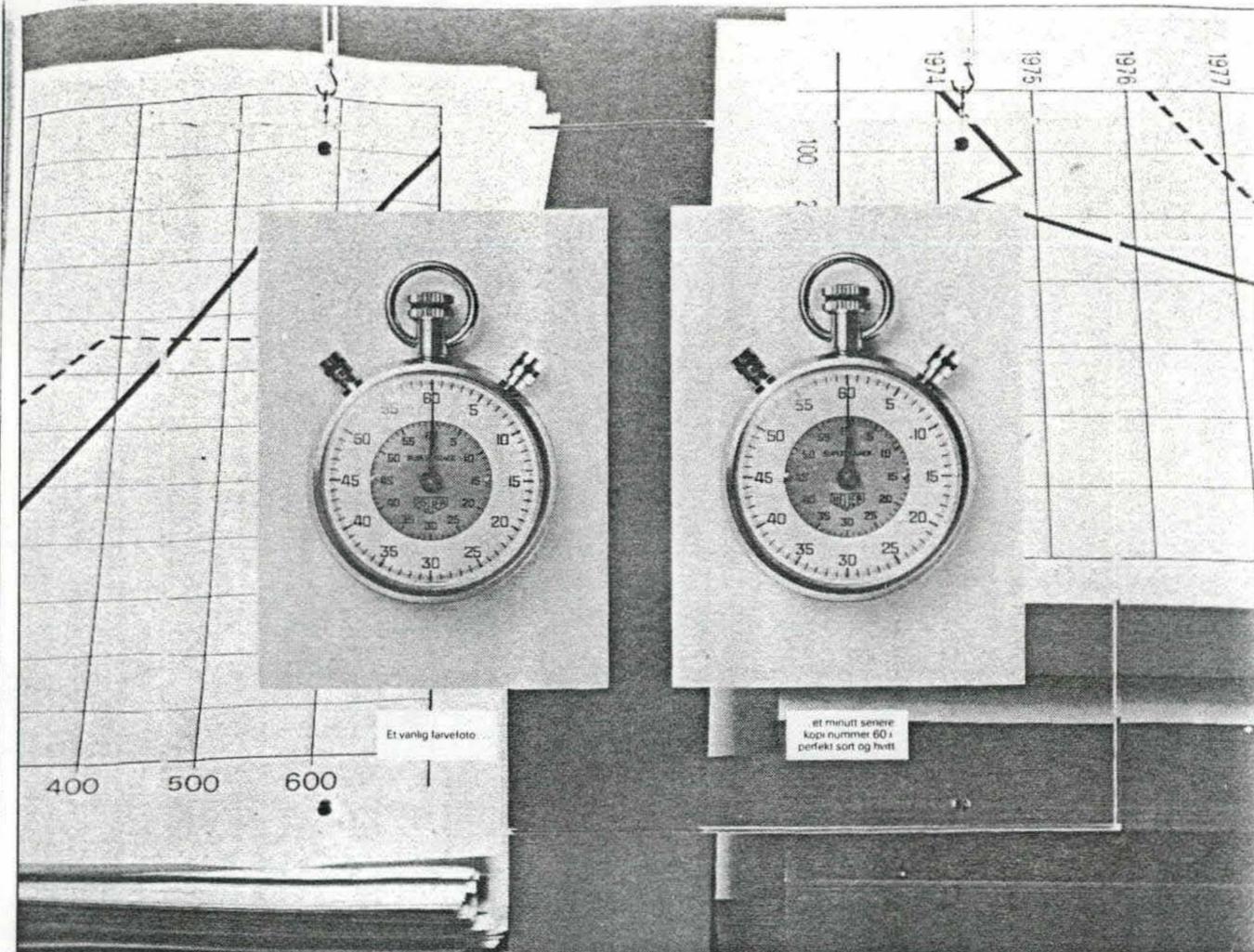
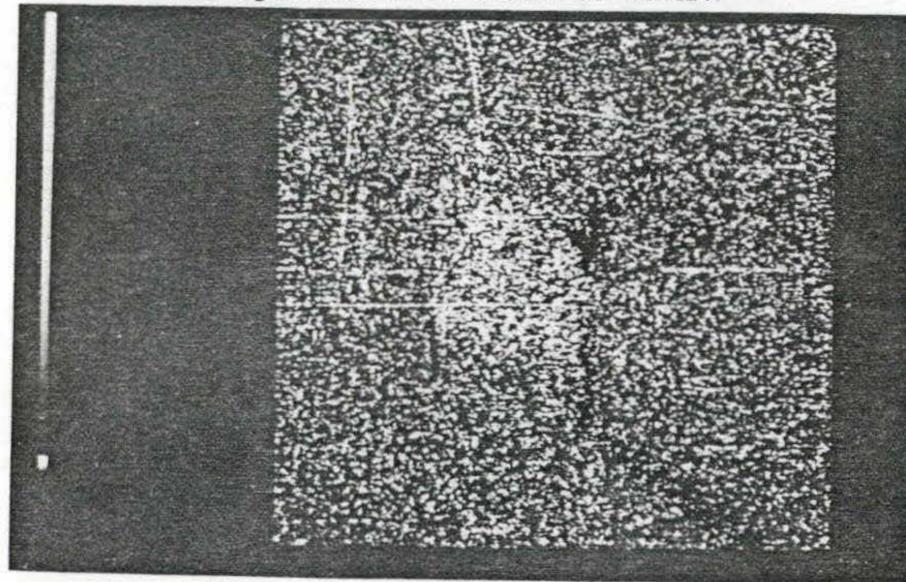


Fig.A22 - Photos taken by Arne P.Thomassen wednesday 25. January at 19.10.(APT1/22,23) There is possible to see some kind of spectrum from 560nm to 630nm.



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