

TELEPHONE CONVERSATION WITH ROSSI

MARCH 23, 1959

R. "The positive action taken ~~xxx~~ like that of recommending an early meeting of European and American Scientists on this problem....

J.L. "Well that would have been done by COSPHAR"

R. "Oh yes that's right."

J.L. " and I understand that the working group under Bartels will be responsible (Alexander's letter) for contamination problems. He doesn't know when it will be held but/ ^{it} apparently will be part of the review of proposals in Cosphar and in fact one of the general recommendations by CETEX was that rather than try to develop a completely anticipatory policy, that instead it would be better if classes of projects would be discussed in COSPHAR and then evaluated in specific terms."

R. "Well that seems to be reasonable, doesn't it?"

J.L. "Well I don't think it will happen. Do you think the Russians are going to tell us first what they are going to send to Venus?"

R. ~~///~~ No, what I meant is that one can not determine a priori the whole set of rules, ~~enables to~~ ^(?) ~~.....~~

J.L. "But I mean there is a specific contradiction right there, isn't there? I think the most we could do is to try to communicate to the Russians what our scientific feeling is and then hope that without them necessarily saying, 'well we will accept this policy', but that they will in any case adopt one themselves that would be consistent with it. Now there was no Russian on CETEX but there was Russian representation at COSPHAR, and I heard second hand that there was already an embarrassment

in that the Russian COSPHAR delegates suggested that part of contamination policy there should be no nuclear explosions done in space because the products of contamination might drift back to the earth, and this was just before the American announcement of Argus, yes. I am sure that was not accidental.

R. "You think that the Russians knew about it already."

J.L. "Well this was published in NATURE two or three months ago, I mean that there were anomalous aurorae and so forth. Now the other thing that Alexander says that the report that they adopted was conservative, that is it didn't try to go too far in what might be called restrictive because they wanted a report that was conceivably acceptable. I don't agree with that philosophy, but that's another matter. Perhaps one reason I don't is that I'm not so discouraged about the difficulty of sterilization of payloads. We've had a couple of discussions on this and I don't think it's an impossible problem at all.

R. "You mean that CETEX did not recommend ^{for} sterilization, or what?"

J.L. "Well it did for Mars but the tone of it was not quite as strong as one might hope, that's about all.

R. "What about Venus because Venus can be just as bad as Mars.

J.L. "Yes, well if the temperature is as high as many people think, it won't...

R. "But is it really?"

- J.L. "We don't know, that's right. There are anomalies."
- R. "The indications are for a high temperature but I certainly wouldn't trust it, not without a thermometer."
- J. L. "Well perhaps the only thing ~~was~~ for you to see a copy of this, I'm sure you'll be getting one, but just to make sure I'll make a thermo-fax of the one I have and send it right away. We had a meeting on Saturday..."
- R. "Oh you had a second meeting?"
- J.L. "Yes. Now nothing very much new came on this but since I had written out all of these recommendations and so on of which you have copies and the rest of the group had not had a chance to act on them formally, I'd say the most important result was that the group did have a chance to read and study these carefully and with trivial exceptions, quite formally adopted these as its own views, that is they are no longer just my own conception of what this committee thinks, they have been specifically adopted. That would be less important except that Urey was also present..."
- R. "I had meant to ask if he was."
- J.L. "He was indeed and we had an excellent time, I must say, I had never met him before and I was marvelously impressed and there is no disagreement at all.
- R. "That's very good."
- J.L. "Urey feels there's a very low probability of anything interesting to be found on the moon and we don't disagree. I think his main reason for accepting a recommendation of caution is to get the practice using the moon as the target rather than any serious concern, but he feels ~~it~~ so strongly about Mars that..."

R. "He must have changed his mind somewhat because he wasn't...

J. L. "He said he had changed his mind."

R. "I did not know because I had talked with him not long ago and I was still a bit skeptical about the necessity of such precautions."

J.L. "Of course necessity can be covered in quite a long way but what we have come down to is that as far as the moon is concerned a reasonable effort at cleanliness should be made. As far as the planets are concerned, our policy is that nothing should be spared to insure absolute sterility of any landing on Mars. And those are somewhat different points of view and as long as that's understood, there is no disagreement whatsoever. It was very important to get together and just have this confirmation that we did understand one another on this. The one further thing is that we had Sinton come to us and we had an extremely interesting time in that respect.

R. "Yes, I went to Sinton when I was in the southwest and spent
(Rough on Mars?)
a couple of days with him."

J. L. "I think all of us feel that the story may, in a way, be finished right here; that it's very difficult to propose any alternative model to account for his observations but that there is extensive vegetation on Mars for which water is perhaps the limiting factor, but It also becomes very apparent that the only thing that we can do from distant approaches is to measure the distribution of various kinds of matter by spectrometry...

R. "Is that with a camera..... with appropriate filters isn't it

J.L. "Exactly, we've already made some preliminary discussion as to what kind of scanning might be adopted and the JPL people were right there and also some of the payload construction people and I think we need more terrestrial examination and

(August 24)
on base

we need more model experiments on diffuse reflection spectra of different types of material over the interesting ranges otherwise we can't be sure what's feasible to detect."

R. "Now when I talked to Sinton, he seemed to be rather skeptical about possible advances from some observation from the earth apart ~~from~~ from the facts you have mentioned but he didn't think that this observation can be improved very much...

J.L. "I've asked him to write this up in a somewhat more considered way. He said that again but when we came to a discussion of the actual sorts of approaches that might be feasible, his main concern is the energy limitation because certainly the angular relation can be greatly improved..

R. "Improved from a probe, ^{approach} but he was skeptical about the possibility of doing anything ^{better (?)} ~~from~~ let us say balloons, or from earth satellites...
(about 29 mly)

J.L. "Yes, that apparently is a matter of the energy requirements, that is he needs the equivalent of a 200 inch receiver in order to get anything measureable at all and you would have to therefore have a very large device, but I don't think he adequately appreciated the scope of the proposals that are being made for the satellite telescopes, things of this sort and I also have the personal feeling that he is so much committed to observational telescopic astronomy that he feels a little insecure about other sorts of approaches.

R. "I had exactly the same feeling."

J.L. "That's why I've asked him to write this down in somewhat more quantitative form and then we'll have something we can criticize a little more accurately. On the other hand, as far a planetary probe is concerned, if we can speak in terms of distances of

100,000 miles of approach, what we felt was that if we could get a scanning of a few diameters or a few chords of the planetary disc which would send back information on distribution at several different wave-lengths, this, much better than a picture, could give us the correlation of the incidents for example of CH and NH and CO and this could almost complete the picture as far as what could be gotten by distant approaches, but the evidence is already so strong that there seems very little doubt."

R. "You mean the evidence about the nature of the absorption bands?"

J.L. "Yes, but that of course is ^a ~~the~~ question, ~~xxx~~ "Can there be any other substances that will mimic those absorptions and that I think can only be done empirically at this time."

R. "There is one thing I would like to mention, there is a group here at M.I.T. which is planning to make a proposal for the vehicle that will go to Mars, circle around at a distance of 5,000 miles and come back to the earth. And they are discussing the possibility of putting in just an ordinary camera which of course brings ^{in all} /the problems of how to prevent the ^(?) clouding of the film on the way over and the way back but this might possibly be done hypothetically and their ~~xxx~~ idea was simply to take a one-shot picture. Now that hardly seems worth the trouble."

J.L. "I don't see how it's worth the trouble, it will be pretty to have but what more detailed information will it give?"

R. "Exactly, and it seems to me that with ~~an~~ additional complication which is just a very minor part of the complications we ~~have~~ already, that is to bring the equipment there and bring it back one could have ^{say} 100 pictures taken with different film (filter) ^(?) ^(also +) then I think it would be extremely valuable. If that becomes

almost 35 on tape

(?) (also +)
32

feasible, I certainly would like to consult with you and these other people as to the kind of wave length that we should toss out and that is all different in observing in some nearby region and by the other one too!

B.L. "I think that before this can be done ~~at~~ best, we have to have more model experimentation actually, because diffuse reflection spectra are very much an empirical problem and very little work has been done on this actually."

R. "That's what Sinton told us."

J.L. "Well this seems to mean Calvin and Moritz and some other people who have had some infra red experience said this very strongly that there's almost nothing on it because it's not a very precise method of analysis because if you can get an absorption spectra ~~xxxx xxxx~~ you are so much better.

The main thing I would like to ask of you does this group after its first coming together was with a little bit of amusement and not taking the matter very seriously but by now every member of the group is dead serious about these issues and we would like to know what measures to take for our own continuation. There are some costs involved, we are not just in San Francisco, we're up and down the coast which is some amount of money ~~add~~ Novick is a little bit isolated, he's a satellite at some distance and has to come down and these telephone bills that I incur ~~are~~ are fairly substantial as you can imagine. I was thinking of either of two procedures, one was to ask you to see if you could help finance ~~xxx~~ us on a somewhat more durable basis so I know from one month to the next that we are definitely backed through the Academy and Space Board...

Golly,

R. "That seems to me the most reasonable thing to do."

J.L. "The alternative would be for us~~x~~ to put up a proposal to NASA,^{*} and I just wondered what you think about that..." *because I have in mind for...*

R. "I would like to study the situation and talk with Bergner. It seems to me that as long as it is a study group of such wide range of interest, that ~~takes time~~ *the Space Science Board*

(about 44 only)

J.L. "I think you should have the first opportunity to pay for us, let's put it that way. I had in mind something of slightly broader scope, i.e. to say..."

R. "What do you have in mind exactly, to form a group of, organize (recognize) a committee of the Space Science Board and be allowed to spend a modest amount of money for occasional meetings would it be on the status of that sort?"

J.L. "I don't think ~~we~~ need to have any official status/what we are ^{because} really trying to develop is our own expertness in the field so that we can be ultimately bringing up proposals in a matter of a year or two for the landing experiments and try to provoke some concern about the distant experiments."

R. ^{*Disproportionately*} "... what kind of financial assistance you need."

J.L. "There are two things involved, one is ~~the~~ strictly the meetings, ~~xxxxxxx~~ ^{with} consultants, I mean to pay for people like Sinton to come to us now and then and this I figured ^{if} ~~we~~ ~~need~~ meet about once every four or five weeks, which we seem to be willing to do, this will come to something like \$5,000/year when you add it all up, but beyond that we have elementary technical questions, i.e. there are some problems of feasibility that we can't answer out of our own experience but with a fairly small amount of money we can get answers to and this is again

still preliminary before any one of us makes a decision about how deeply to go into it and I think that should still be financed on a group basis rather than a project basis because of the flexibility and this might be considerably more."

R. "The kind of expenses that you have financed are ^{extra savings} travel and subsistence for these meetings ..

J.L. "Yes, that's the first item but if we are to do ~~any~~ even some exploratory work, we may want to, so to speak, subcontract to get some measurements on reflectance spectra for example.

R. "That ~~would be not~~..., is something the Space Science Board cannot do.

J. L. "The only point was that I don't think we're yet in the stage where we individually want to get separate contracts or grants to do projects, we still want to be in a position where we are talking to one another about it and then when we more or less collectively decide that there's something here needs to be looked into a little bit more that we can have a few thousand dollars if necessary to try and get some measurements made, for example in an industrial contract laboratory like SRI. They have spectrophotometers and I think for a few thousand dollars they would give us, in a preliminary way, the diffuse reflectance spectra that we need and so on. It is at that level that I was thinking of now. Later on this will provoke, of course ...

R. "Even at this level I believe you need some financial support from one of the Operative Agencies which ~~are~~ are either NSF or NASA, because the Space Science Board cannot pay for that. Can be a combination of the two. Why don't you let me think it over and I'll communicate with you very soon. I am going to Washington, ~~xxxxxx~~ at the end of April,

would that be too late?"

J. L. "It's not too late for the long term business, we are scheduling our next meeting on May 3rd at Pacific Grove with van Niel in his lab."

R. "Did you have any representative (secretary) from the Space Science Board at your meeting?"

J. L. "No, he was invited to the first one but no one came apparently was too much in a hurry and this one was so soon after COSPHAR that it didn't happen. The way we've been going along is this, I've warned everyone that I would not know in advance whether there would be funds to pay for the meeting and I would try and collect them so any single meeting anyone can pay for himself but they won't come again..."

R. "Of course, but I had assurance that the Space Science Board would provide expenses for your past meeting, for your meeting of a few days ago."

J.L. "That was my understanding too, but you see I don't have it now for the next one and yet I have to use the occasion of the ^{meeting} current/~~one~~ to plan the next one so we're going ahead on that basis for May 3rd. This is on the assumption that you would like us to continue to talk to one another and send you reports and so on."

R. "That would be wonderful but it's not I who can decide those things, ... (?) ^{the fact that I've [interest passion] (about 62)} someone else would come in anyway."

- R. (cont.) "I'm not biologist, but it seemed to me that this was really the most important project of all. I imagine Hugh Odishaw is still in Europe now."
- J.L. "He's back around now, I've had a letter a couple of weeks ago, he gave his dates. Should I discuss this with him directly or would you like to talk to him about it?"
- R. "I don't think that one thing prevents ~~another~~ the other. I certainly will ~~talk~~ discuss it with him but why don't you discuss it too?"
- J. L. "Shall I call him now or shall I wait or should I wait for you to have been in touch with him?"
- R. "Just whatever you want, I don't think it makes any difference whatsoever, but I will personally call him."
Another thing ~~is~~ I wanted to ask you, it seems to me that it would be useful to divulge our results. "
- J.L. "Yes, I was just going to raise that. First of all, I wondered would there be any objection to private circulation, i.e. there are copies available of these reports, I'll be sending you more of them, can you see any objection to personal
- R. "I cannot see the slightest objection. But it probably ~~is~~ would be more useful if one could at the first moment (?) check take ~~up~~ ^{the reports} of those first four or five meetings that you have had and try to make a single document that would read more easily than a, What do you think about that?"
- RJ. L. "I am in favor of it but I just wonder who should do it, I am already doing about as much as I can now."
- R. "Well I don't know, we could have some young, enthusiastic person try to summarize.."
- J.L. "This ^{may come up and it} may be possible to do that fairly directly. That reminded

me, there was one other suggestion, of course the big problem is how to get the Russians interested in this game. I, in fact finally had a letter back/from Igor Tamm, I had talked to him and he said go talk to COSPHAR, we have a national representative on that and that's the agency for it. It was very polite in tone but that was the gist of it. Someone else made a suggestion and perhaps there's some point to it and that is to write a small article more or less along the lines of what CETEX ~~xx~~ has had in mind but expressing what would probably be the more emphatic point of view of one individual and to send this not only to Nature but also to PRIRODA, to the Russian Journal, have it translated first. There's been some experience with that and I forget who it was, Calvin perhaps, said he was sure that they would accept such an article. I don't know whether there's any point to that or not. I think perhaps the CETEX report is going to be... It's important that the DETEX final report be disseminated."

R. "Let me ask you, in your group now, you have I know a number of biologists, then who else do you have?"

J.L. "It's almost all biologists officially but Krauskopf from the geochemistry group here at Stanford has been sitting in and as it happens, because Horowitz happen to know him personally, it was a very important connection, in fact a vital one, is that Davies and Hibbs from the JPL because they will actually have a large part of the final ~~xxxx~~ missions and so they have exploited our group as the ~~if~~ means of their making contact with biological interest here. ~~xxxxxxx~~ The vehicle people are represented at an effective working level."

- R. "And then you need some physicists ."
- J.L. "Well, we have people like Aaron Novick and ..
- R. "At a later stage probably when it comes to actually planning instruments "
- J.L. "Yes, those things, I thought might not so much part of our group as what each of us individually does when we have a project ready, you see? Actually finishing it up."
- R. "Do you have any astronomers?"
- J.L. "Weaver from Berkeley, he's been very useful."
- R. "Fine, I'll get in touch with the Space Science Board and I have also contact with NASA now quite frequently, so "
- J.L. "You'll try to see some way to keep us going, in other words?"
- R. "Certainly it's most worth while . Thank you very much and congratulations on all the work you have done."