Freeman Dyson

-- P R I V A T E --

Personal Notes on the "Pugwash" Conferences on Science & World Affairs, Numbers IX & X

(Held in England -- August/September, 1962)

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AUTHOR'S NOTE: These notes were prepared in draft form immediately following COSWA X in September, 1962, and were shown to only a few people around Hudson Institute. There are however some points that seem worth reporting in other quarters even at this late date (May, 1963), which accounts for this limited reproduction.

A. V. Topchiev, mentioned at several points in the notes, died in Moscow in December, 1962, of a heart attack.

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NOTES ON COSWA IX AND X

Introduction

These notes are intended to report--to a limited audience--the items I found of most interest in connection with the "Pugwash" conferences on Science and World Affairs numbers IX and X. COSWA IX was held at Caius College at the University of Cambridge in Cambridge, England, from August 25 through August 30, 1962, and COSWA X was held at the Hotel Russell, London, England, from September 2nd through September 7, 1962. COSWA IX was a relatively small conference (of perhaps 50 participants) on disarmament and world security; a list of participants and observers to this conference is attached. COSWA X was a much larger conference (roughly 200 participants) intended for a larger range of issues centered on international cooperation in science, but it turned out that most of the 200 participants were chiefly interested in disarmament. Many of these participants were new to the subject.

I assume the general background and nature of the COSWA conferences is known to the reader of this report. No attempt will be made here to survey in a balanced fashion the ninth and tenth conferences;* my sole object is to report a number of private discussions in which I personally took part and which would not be generally known to all participants in the conference and which also would not appear in the conference proceedings.

Soviet Participants

There were eight new faces among the Soviet participants at these conferences and one new face among their observers. I did not have much personal contact with many of these new participants, but one important exception was the case of L.A. Artsimovitch, who played an important role in some of the discussions mentioned below and is worth introducing here. He is unquestionably one of the brightest of the Soviet participants to have turned up in these conferences, and is a very free and lively spirit. He probably has as much intellectual power as Bogolubov or Tamm, but in some sense he is brighter than either of these people and, what is more important, entered the discussions of substance at these conferences on a far more intellectual level than either of these people. He has provided the best discussion of substance of any Soviet participant I have encountered at any of these conferences. He distinguished himself the opening day of the ninth conference at Cambridge, when, after listening to the opening papers at the plenary session and some of the succeeding comments thereon, he got up to the microphone and remarked that we hadn't the qualifications for repeating the discussions of the diplomats. I did not have the sense that this remark was aimed solely at participants from the West. Unfortunately, however, subsequent discussions proved that there were many participants from both East and West who either did not hear or did not understand this remark.

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*More complete summaries have been given by F. Dyson and by A.R. Hibbs.

Artsimovitch is a working physicist who is said to be in charge of their fusion power research. This was reported in someone's casual remark and could be wrong. I have heard it conjectured by a Westerner, much less casually but still a conjecture, that Artsimovitch was the Russian equivalent to Teller in the sense of having been responsible for their thermonuclear weapon development. This conjecture was supported inferentially by some discussion with him about his previous work.

Soviet Mobile Weapons?

At the ninth conference in Cambridge, the participants were split up into working groups during much of the conference. General N.S. Talensky, a prominent Soviet military publicist though not necessarily an important military planner, and who has been a regular participant at the COSWA conferences, turned up on the same working group to which I was assigned (on the control of conventional forces). Perhaps the most significant remark Talensky made during the working group sessions was on the first day of these meetings, when he remarked that the theories of their U.S. friends about achieving invulnerability of strategic weapons by mobility have been taken very seriously in the Soviet Union, and that they now have lots of invulnerability-by-mobility. This remark is worth a number of observations. (a) Talensky may or may not himself know the actual state of Soviet strategic weapon systems. (b) Whether he himself knows or not, the allegation that they now have lots of mobile weapons systems is an essentially political remark that may have been carefully calculated to be reported in just such quarters as this memorandum is going to, and it may have very little contact with the truth. (c) In spite of this, the significance of the remark should not be minimized. It is especially interesting to reflect on the fact that Talensky does not read or speak English, and that the bulk of the Soviet participants who turn up at these conferences and who do read English quite obviously have no significant familiarity with Western strategic literature. Therefore, either some of this literature has been translated into Russian and circulated in quarters where Talensky encountered it in translation, or else he had been encountering discussions of this material among some of his colleagues who do read English but who do not turn up at these conferences. In either case, therefore, it would appear that his statement that the theories have been taken very seriously in the Soviet Union is quite likely true. (d) Therefore, even if the allegation about the present existence of invulnerable forces is not as true as Talensky would have had us believe, it probably does reflect the direction in which they are in fact presently moving.

An Inspection Problem

In the standard East-West dialogue about arms control inspection, the West has usually (and usually correctly) taken the view that in cases where some important constraint was placed on military activity, it was necessary to have some degree of search-type inspection in the Soviet Union to inspect for clandestine weapons or facilities. The Russians

have quite generally objected to such inspection for clandestine facilities, which they often term "inspection over armament" and reject vigorously. The basic idea of the objection seems to be that the inspection will provide espionage information about remaining Soviet forces, presumably most especially target information about strategic nuclear forces. This objection is not without some degree of justification, though it does not seem likely that the argument is in fact decisive for Soviet policy decisions in this area. To whatever extent the problem may seem real to the Soviets, however, it admits an intellectual solution based on mobile weapon systems, and Talensky's remark quoted above about mobile weapon systems provided an opportunity to open a discussion of this subject.

A luncheon was accordingly arranged a day or two later with Talensky, at which Wassily Leontief of Harvard, one of the U.S. participants, served as an interpreter, and at which Henry Kissinger was present for a time. The main original object of the meeting was to explain to Talensky that mobile weapon systems are not necessarily vulnerable to reporting by inspectors. In particular, if the communication delay time before an inspector can get a message back "home" is long in comparison to the time required for the mobile weapon to move a distance that is large in comparison to the "kill" radius of the attacking weapon, the mobile weapon may be nearly as invulnerable as if it had never been observed at all. (This statement needs some degree of qualification depending on the exact circumstances of the case.) Therefore, if one is attempting only to verify inventory information about force levels by inspection, including in particular inspection for clandestine weapons or facilities, and not trying to use inspection to provide readiness or deployment information, it is a simple problem in engineering to design some combination of mobile strategic weapon systems and a built-in communication delay in the inspection reporting arrangements in such a way that the vulnerability of the mobile weapons is not significantly increased by the inspection.

This was the nature of the point to be made to Talensky. However, though the meeting led ultimately to a number of useful things, some of which will be mentioned below, Talensky's understanding of this point did not seem to be among them. Talensky was careful to take with him (unasked) the scratch paper on which we had been discussing this point (among others), which was a useful if amusing thing to do and perhaps ultimately he assimilated the point. Whether he did or not, however, I made the same point to other Soviet participants at other times, and in one case struck a visible response. I tried it on Tamm and Emelyanov at different times, but in neither of these cases did it appear as if they understood the relevance of the notion to the things they had been saying about "inspection over armaments" and alleged Western espionage. It was Artsimovitch who provided the visible response. It was first tried on him during the course of a two-day sight-seeing tour some of us took between the Cambridge and London conferences. It did not seem then as if he really assimilated the point, perhaps due to distractions during the conversation in question, and it later proved that in fact he had not.

During the course of a private conversation in the middle of the London conference, a conversation that was more important for something else discussed below, I returned to this point and sketched the idea

again, and this time he understood it very well. He asked a number of intelligent questions about it and wound up saying that he understood the idea and it seemed ingenious but not very important. I told him that I didn't think it important either, but that most of his colleagues had been raising this difficulty of vulnerability-by-inspection as an intellectual problem for which the communication-delay-plus-mobile-missiles furnishes an intellectual solution, and therefore the solution was important in roughly the degree the alleged problem was thought to be important. Artsimovitch grunted at this remark and looked faintly amused, and when I handed him the scratch paper we had used with sketches and computations relating to the scheme, inferring rather blatantly that he was supposed to take them off, he grinned broadly and stuffed them in his pocket.

It is not to be expected that any reflection of this discussion will appear at Geneva within the foreseeable future, though it may have useful effects of a secondary kind, such as illustrating for them the fact that there are interesting interactions among disarmament problems, the design of strategic weapon systems, and deployment and operating practices, and this may possibly stimulate them to devote more thought of their own to such matters. But this is probably the most that could be hoped for.

The McNamara Speech

There were two or three indications of awareness on the part of the Soviets of Secretary McNamara's Michigan speech of last June, of which the most specific and concrete came from Talensky during the luncheon meeting reported above. Talensky alluded to the speech and the city-avoidance doctrine enunciated therein, and remarked that they had heard that people in the United States had objected to that doctrine because it spared too many Russian lives. (He made this point in a matter-of-fact and seemingly friendly tone.) I replied that there were some groups that had responded in this fashion (there were), but that they were extreme fanatic groups on the far fringe and had no influence whatever on policy. Talensky seemed to accept this but went on to say that if a general war were actually to break out, the initial attacks would surely be on cities. He seemed to believe this, i.e., he did not seem to be making a statement for the record merely.

Accidental War

An important opportunity was presented by Talensky during the luncheon discussion reported above. At one point, during a digression about the problem of escalation, Talensky mentioned that he had a friend (a general) who was a division commander and that this division commander was of course under instructions not to use his nuclear weapons without authorization. However, Talensky went on, the division commander might well find himself in a position during a conventional war in which his division seemed on the verge of being destroyed, and if he thought he could save the situation by using his nuclear weapons, he might possibly do so, instructions or no instructions. I promptly asked Talensky: Suppose the weapons were fitted with what amounted to combination locks,

except that the "combinations" would not be in possession of the people (notably his friend the division commander) having custody of the weapons, but would have to be transmitted from some higher authority in order to unlock the weapons and make them usable? Talensky did not respond as if this idea were either familiar or interesting, and his remarks about it were all in the class of sheer noise. (For example, he said that the division would no doubt have some clever fellow like Edward Teller along who could find some way (in the field!) of circumventing the lock.) Though it is not possible to be certain, it would be worth betting fair odds that Talensky had never heard of such a thing, though he might not have heard of it even if it existed, and he did not miss the chance to put some notes about it in his pocket along with the others mentioned above.

Once Talensky had provided the opportunity to raise the point, it was equally possible to raise it with others. I first tried it on Emelyanov, going very slowly and very carefully in a quiet and leisurely meeting and beginning with the explanation that Talensky had mentioned the problem about his friend the division commander, and wondering what Emelyanov would think of the indicated solution to that problem. Emelyanov, who speaks and understands English fairly well and needed no interpreter, reacted to this suggestion as if it were so much noise and proceeded to respond with noise of his own. ("It would still be possible to start a war", and other remarks of a similar intellectual level.) Emelyanov was until a year ago head of the Soviet State Atomic Energy Authority, who apparently has many highly placed friends including Khrushchev, and who would be much more likely than Talensky to know what kind of ideas of this sort might have been implemented or under consideration, and it did not appear that he had ever heard of such a thing.

I tried it next on Tamm, using the same introductory explanation about General Talensky's friend, but drew the same kind of blank that came from Talensky and Emelyanov. (Perhaps Tamm's response was something like "we must have general and complete disarmament.")

Again, it was Artsimovitch who proved most useful to talk to. Again, I began with the story of General Talensky and his friend and drew a sketch showing schematically a bomb, the combination lock on the bomb, an immediate custodian who did not have the combination, and a line going to a remote headquarters from which the combination could be operated. Artsimovitch studied this sketch for perhaps 10 or 15 seconds and said, "the remote headquarters might be the White House or the Kremlin." I said, "For instance." Artsimovitch studied the sketch for perhaps another 20 seconds and then said: "It would make the remote headquarters a highly attractive and important target to attack."

It would seem relatively trivial for a Western analyst to respond with this observation, but this was the first time I have ever encountered a Russian who responded on a purely intellectual plane to the substance of such a problem under discussion. The response is to be contrasted with Talensky's response that some clever fellow like Teller would bypass the device. Artsimovitch's response therefore seemed quite interesting in the context of discussions of such matters with Soviet participants.

In response to his observation, I said perhaps it would make the centers attractive targets, but presumably one could provide one or two alternative centers, protect them very securely, and protect any communication channels involved between these centers and the associated weapons. Artsimovitch did not say much in response to this, and I went on to explain that if one were to do such a thing, it might be necessary to trade off some chance that the system might not work when it was required in exchange for a great deal of added safety that it would not go off when it shouldn't. However, the engineering problem in implementing this trade-off should be solvable in such a way as not to make the cost in reliability of functioning too great. Artsimovitch seemed to accept these points, and was clearly much interested in the scheme, but there was not much more we could discuss about it. In particular, he did not ask, and I did not volunteer, whether, when, or how any such thing was being implemented for Western forces, or some segment of Western forces. After a few more minutes we let the subject drop, but the sketch was one of the items I handed him and which he put in his pocket.

There is no question in my mind but that these thoughts were new to Artsimovitch and that he was much interested in them and that he would carry them home. It is of course a more open question as to whether or not he would know of any such system if it had already been installed at home. If his connection with the Soviet weapon program is still a close one, it could be fairly presumed that the Soviets do not have such remote safeties on their weapons and that the thought of putting on such safeties may receive a good deal of attention. On the other hand, Artsimovitch may well not have had any close contact with the weapon program for some time, in which case the inferential evidence deduced from Talensky and Emelyanov would probably be stronger than inferences from Artsimovitch.

The Gilpatric Speech

Deputy Secretary of Defense Roswell Gilpatric made an especially fine speech on arms control at a ballistic missile symposium at the Air Force Academy on August 13, which said a number of important and intelligent things about working on problems of accidental war, such as provisions against accidental or unauthorized use of nuclear weapons of a purely unilateral character, and other matters that were more sophisticated and thoughtful than is usual in high level speeches about arms control. The speech also treated Soviet security problems with a degree of seriousness that was distinctly unusual for a high policy speech. That is, without conceding any substantive points at issue, the speech acknowledged quite frankly that the Soviets might well honestly believe they had need of a substantial military establishment. Therefore, on both counts--the sophistication and the symmetry of treatment of the two sides--it seemed like a particularly valuable speech to feed in to the Russians. Through the courtesy of Howard Margolis in the Office of the Secretary of Defense, a supply of copies was air mailed to the London conference and distributed by Wassily Leontief and myself to a good many Soviet participants-----probably to most or all of those who spoke English. We made the point that so far

as we were aware, it was the first serious speech on arms control by a high level defense official of any country.

The immediate response among the Soviets to this speech was highly favorable. One of them remarked explicitly that he "could agree with at least 60% of it" and promised to circulate it at home and to translate it for the benefit of Topchiev and others who did not read English. I think he was surprised by the character of the speech. At about the time we were circulating copies of this among the Russians, Topchiev made an especially abominable speech at one of the plenary sessions of the London conference blaming all of their troubles on Western imperialism, and I think some of the Russians were more than a little embarrassed by the contrast between Gilpatric's speech and that of Topchiev's.

Sino-Soviet Relations

I did not see many indicators of current Sino-Soviet relations, but one slightly amusing incident might be worth reporting. At one of the meetings of the working group in which I participated, General Talensky was berating the alleged wickedness of foreign bases and foreign troops on foreign bases, and went fishing for an example that he thought would illustrate the problem to us. With obviously dark and dire overtones suggesting that we ought to be scared, he asked how we of the West would feel if the Soviet Union were to permit the stationing on territory under its control of troops of the People's Republic of China. I intervened promptly to respond that we should be at least as prepared to contemplate this possibility with equanimity as were our Soviet colleagues. The interesting part of this story is that all of the four or five Russians sitting around the table, including Talensky himself, grinned broadly at this response, which they understood very well.

Emelyanov's Jobs

During the two day tour between the Cambridge and London conferences, I had a number of interesting conversations with Emelyanov. In one of these, he explained the circumstances of his departure from the chairmanship of the State Committee on Atomic Energy of the Soviet Union, a job that probably corresponds to the chairmanship of our A.E.C. Emelyanov had held this position until about a year ago. At the time of the meeting of the Board of Governors of the International Atomic Agency in the fall of 1961, to which Emelyanov was the chief Soviet delegate, the Western members of the agency and in particular the United States were pushing a Swede as the Western candidate for the position of Secretary General, a position that had formerly been held by Sterling Cole. The Soviet Union and one or two other members of the agency were pushing an Indonesian for the position. The West had the votes to put the Swedish candidate into the office, which made Emelyanov very angry and he asked the Soviet government to relieve him of his assignment as delegate to the I.A.E.A. Emelyanov explained, with a straight face that did not suggest any especial embarrassment, that a couple of weeks later he received word back from his government that they could more readily replace him as chairman of the State Committee on Atomic Energy than as delegate to

the I.A.E.A., and that therefore he should stay on as delegate to the Agency but would be relieved at home. This conversation struck me as notable for the relaxed view that Emelyanov took of being replaced, and even more notable for the seeming candor with which he reported the details of this switch, without having in any way been asked for this information.

The International Study Group

As most readers of this report will know, there has been--since the time of the Moscow conference in November-December 1960--discussion of a small full-time study group of Russian and American (and perhaps other) scholars to discuss problems of arms control and disarmament, or more generally problems of war and peace and how to preserve the latter. There is a committee of the American Academy of Arts and Sciences that has served as the principal American stimulus to this operation, and five of the members of this committee were present at the Cambridge conference. These were Paul Doty, Henry Kissinger, Dick Leghorn, Louis Sohn, and myself. We held a meeting one evening with a counterpart committee of Soviets, consisting of Topchiev, Talensky, Khvostov, Emelyanov, and Pavlichenko.

The Russians had advised us some time ago (in November 1961) that they were committed to proceeding with the establishment of the full-time group, and the principal thing they wished to tell us at this meeting was that they were still ready to proceed, and were still simply waiting for us. Topchiev said that he could identify some of the people who were prepared to participate in the group, but he preferred not to at that time (I had the sense he really meant preferred, and that he would have mentioned names if we had pushed for them) though their prospective participants did include, he said, some very important people. There was some brief discussion of the agenda with which the group might start, during which we suggested that the group might have two tentative initial topics, first the composition of the first stage of a disarmament program, and second, ways of maintaining the peace. They seemed agreeable to these topics though there was not anything like a formal decision taken on at this point.

We explained that we were in the final phases of lining up participants, and that the enterprise basically required only a sufficiently strong group in order to have it go forward. It seemed as if we should be ready within a very short time for the final discussions and we so advised them. Though not nearly as detailed, these brief discussions were at least as amicable as the tentative organizational discussions we had with them over this topic at the Stowe conference in the fall of 1961. Topchiev made the point that they believed the proposed discussions of the full-time group were important "both for you and for us", a point with which we agreed.

The International Journal

There has been under discussion for about the past year and a half the possibility of establishing an International Journal on Arms Control,

with the intent of having both Soviet and Western participation in this journal which was intended to be distributed both in the West and in the Soviet Union. This suggestion originated (so far as this context is concerned) with Capt. I.R. Maxwell, Managing Director of Pergamon Press, in the early summer of 1961. The initial arrangements for editorial board, etc. of this journal were fairly well under way when someone conceived the idea of offering the journal to the COSWA continuing Committee to be the COSWA Journal. It was thereupon discussed for this purpose at the fall 1961 conference at Stowe, where an editorial board was set up to be responsible for the journal on behalf of COSWA, and at subsequent meetings of both the COSWA Continuing Committee and the editorial board it established.

In contrast to their response to the full-time study group, the Soviet outlook toward this journal has been alternately friendly and chilly. The people we have been dealing with, principally Talensky, Topchiev, and Pavlichenko as the Soviet members of the Editorial Board, have been visibly interested in seeing the journal emerge, but they have clearly been operating under strong constraints as to what they could agree to by way of arrangements. In particular, it has been apparent for some time that they were uncertain of being able to provide a Russian language edition of this journal to be distributed freely within the Soviet Union. At the time of the London conference, during which we had a meeting of the Editorial Board, they finally told us definitely that there could not initially be a Russian language edition to be distributed in Russia. They would, however, contribute papers and distribute some copies (under control) of the English edition.

That finished the COSWA Journal as such, so far as the other members of the Editorial Board were concerned, at least for the time being. I think it is possible to understand why they reacted as they did to the journal. The proposed editorial arrangements were as follows. First of all, we were going to try to operate the journal with unanimous consent among the nine members of the Editorial Board. There were three British, three American, and three Soviet members of this board. It was, however, quite apparent to all concerned that the journal might not operate if it required unanimous consent of that Editorial Board for any paper to be published in it. We therefore had a fall-back position agreed upon that would split the journal in the obvious way into Eastern and Western pieces, with the Soviets to have editorial veto only over the Eastern part and the Western editors to have editorial veto only over the Western part. The whole journal was however to be translated and circulated in Russia.

I should guess, though it is only a guess, that the members of the Soviet officialdom with whom this proposed journal was undoubtedly discussed noticed that while the "unanimous consent" form of the journal might have seemed acceptable, the journal as it might have developed could have left them printing and freely circulating (in Russian) papers on matters of the utmost sensitivity to them and on which they would have had no editorial control in the "fall-back" position. This fact would probably be sufficient to account for their ultimate decision, which was communicated to us with visible reluctance by Talensky, who expressed the hope that some day it might be possible to work something out but that they would first have to experiment with more limited distribution of an English edition.

Participants and Observers at COSWA IX, Cambridge, England, 25-30 August 1962
("O" denotes Observers)

Australia
(O) John Burton
Mark Oliphant

Brazil
Oscar Sala

Bulgaria
G. Nadjakov

Canada
(O) Norman Alcock

Czechoslovakia
Theodor Nemec
Vladimir Prochazka
Ludek Urban

Denmark
O. Kofoed-Hansen

France
Pierre Genevey
F. Perrin
Pierre Rosenstiehl

Germany
G. Burkhardt
E. Menzel
(O) U. Nerlich

Hungary
F.B. Straub

India
V. Sarabhai

Japan
H. Yukawa

Netherlands
B.V.A. Röling
(O) F.J.A. Terwisscha

Pakistan
Abdus Salam

Poland
Leopold Infeld

Rumania
H. Hulubei

United Kingdom
P.M.S. Blackett
Alastair Buchan
Edward Bullard
John Cockcroft
(O) B.H. Flowers
(O) O.R. Frisch
Michael Howard
(O) J.C. Kendrew
Nevill Mott
(O) Robert Neild
Philip Noel-Baker
R.E. Peierls
William Penney
C.F. Powell
(O) B.T. Price
J. Rotblat
Wayland Young
(O) Solly Zuckerman

U.S.A.
(O) Ruth Adams
D.G. Brennan
Harrison Brown
Paul Doty
F. Dyson
B.T. Feld
Bentley Glass
R. Gomer
(O) Albert Hibbs
(O) Amrom Katz
Henry Kissinger
Richard Leghorn
W. Leontief

U.S.A. (cont.)
Walter Munk
Jay Orear
I.I. Rabi
Eugene Rabinowitch
F. Seitz
L. B. Sohn
Leo Szilard
C. Townes

U.S.S.R.
L.A. Artsimovitch
(O) N.I. Bazanov
(O) G.P. Besedin
A.A. Blagonravov
N.N. Bogolubov
M.M. Dubinin
W.S. Emelyanov
N.N. Inozemtsev
V.A. Kargin
V.M. Khvostov
(O) S.G.T. Korneev
F.I. Kozhevnikov
A.M. Kuzin
A.I. Leipunski
(O) V. Pavlichenko
U.V. Riznichenko
M.I. Rubinstein
N.A. Talensky
I.E. Tamm
A.V. Topchiev
A.N. Tupolev
A.N. Vernov

Yugoslavia
Ivan Supek