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Selected SIGINT Intelligence Highlights

Address to the C.A.A., 8 May 1974

BY DR. LOUIS W. TORDELLA

Top Secret Umbra

I have to note before I begin that my selection of items is somewhat like dealer's choice, and if you had someone else stand up here who has had roughly the same time span that I have had, I am sure that he would not pick the same items that I am going to select. I am not going to say too much about World War II because a lot of us have good ideas of the contributions made by SIGINT in that war, either from the press or have had personal experience, or have talked with people who were there firsthand.

You know about the battle of Midway; you know about the Pacific Campaign, both of the Navy and the Army; you are familiar with things like the shoot-down of Yamamoto, made possible by the information that we were able to provide. The "we" means the Army Security Agency, the Navy Security Group, and also the units which had Australian membership working on these problems. SIGINT was very important in the Pacific; for example, we were able to give with the same accuracy as the Japanese had the noon positions of the various convoys that were bringing material from the Indies and from various of the occupied territories the Japanese had taken over. Naturally this somewhat facilitated the submarine warfare. Generally, it was quite a success story.

On the other side of the world in the Atlantic, as you well know, there was complete sharing of efforts and results with the British. I think one point that is not always appreciated in connection with the War in the Atlantic is that much of the information, both before and after we were reading the German naval machines, was used to divert the convoys and control their movements. Until the very end of the war we were not often in a position to go out and sink the submarines that were lining up in their so-called wolfpack tactics, but we were able to spot this line-up even before we were doing any decryption by using results from HF/DF. That was the first assignment I had in this business, being in charge of a D/F watch. What we would do was note the accumulation of fixes in an area and relate them to a convoy that happened to be, perhaps, headed for or already in that area. A decision would then be taken at the War Room level in the Navy Department to divert the convoy, almost never to throw a half dozen unavailable destroyers in there and hope to depth-charge the subs out of the water.

TOP SECRET UMBRA

HIGHLIGHTS

(b) (1)
(b) (3)-50 USC 403
(b) (3)-P.L. 86-36

DR. TORDELLA

TOP SECRET UMBRA

A second, tremendous benefit when we were reading was that of being able to tell where the "cows" were, the submarine tankers used to fuel the German subs. A deliberate effort was then made each time to get a carrier into the vicinity to provide an airborne source of radar, or a destroyer, although it was less plausible to have a destroyer there. We would then often be able to sink the "cow," and that did shorten the time on station considerably for the submarines that were dependent on refueling. These aspects of the War in the Atlantic are sometimes glossed over.

All of you are familiar, of course, with the tremendous amount of information that was provided in the Battle of Britain by SIGINT, and it has correctly been said that Mr. Churchill's statement, "Never have so many owed so much to so few," really meant two different "few," only one of whom, of course, could be given public recognition. One "few" was the pilots in the RAF, and the other "few" was the cryptanalysts who made it possible for those pilots to be grouped and on the alert so as to be able to be where the radar would indicate German planes. With propeller-driven planes of limited numbers, the RAF had to move and focus its fighters hours before the radar showed pips of an approaching raid. The radar provided a very effective cover for the SIGINT used in the air war and was vital immediately before and during combat, but was given more credit by the Germans than was actually warranted.

As you know, the success against the ENIGMA up to now, or almost to this date, has been rather well kept as a secret, but just recently there have been threats of many and actually one book in print. They don't give many technical details yet, fortunately, but Bertrand's book, ENIGMA, the ENIGME, which is the ENIGMA twice in the title, indicates that there was a cryptanalytic success against the ENIGMA, and that the French continued some work even after Vichy.¹ This book will probably be translated into English, and I would caution all of us that it's still "No comment."

There were some failures too in this business, and all of us know some of them. Our usage of Hagelin in World War II was abominable, and the Germans profited greatly from it. Our misuse of SIGINT in the Battle of the Bulge resulted in thousands of deaths. And on the other side of the world we really geared up quite an invasion of Kiska, perhaps you remember, and when we landed in Kiska—one of my friends was in the landing party—we couldn't even find any good sou-

¹See NSA Technical Journal, XIX, 3 (Summer 1974) for Edwin S. Spiegelthal's "The Cryptologists Who (Briefly) Went Back Into the Cold," a book review of Gustave Bertrand, ENIGMA, ou la plus grande énigme de la guerre 1939-1945 and the related book by Michel Gardner, La guerre secrète des services spéciaux français (1935-1945).—Ed.

TOP SECRET UMBRA

2

venirs, much less any Japanese. It has been also said, and I am somewhat inclined to agree, that had we had good traffic analysis, we perhaps would never have had Pearl Harbor, because a very accurate traffic analysis of the movements of all of the fighting units and the supply train connected with them might very well have given considerable pause to the theory that any attack by the Japanese was going to be made south rather than towards Pearl Harbor.

In any event, enough about World War II. I'd like to talk about post-World War II. And first of all, I'd like to look at the Soviet problem. The biggest intelligence success based on SIGINT that always stands out in my mind when I think of the forties and the early fifties is the success that we, collectively, that is the [redacted] ASA, NSG, and then [redacted] AFSA [redacted] NSA, had against [redacted] that was used by the Russians. That was both a success story in [redacted] and also a success story in the intelligence arena. Some of you may have participated directly and you may remember the [redacted]

The design of equipment to cope with that was no mean feat in itself. But I want to talk this morning about the intelligence successes [redacted]

[redacted] In the late forties and the early fifties, I know we made a terrific contribution to the knowledge the West had of what was going on in Russia.

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(b) (3)-18 USC 798
(b) (3)-50 USC 403
(b) (3)-P.L. 86-36

~~TOP SECRET UMBRA~~

HIGHLIGHTS

DR. TORDELLA

~~TOP SECRET UMBRA~~

[Redacted]
there. It was that kind of information that we were able to provide to the Community.

I think it is also worth stressing the advantage we received from our intercept of telemetry, which started in the fifties. If you recall, we

[Redacted]
collecting, as most of you are aware. The information that we have gotten and continue to get from telemetry collection has been very extensive.

We have also been able as a result of the collection of telemetry to give extensive information about the Soviet space program. And although it is a third-hand quote, Dr. Pickering at JPL is quoted as having said that information from SIGINT saved several hundred million dollars in the cost of the U.S. Space Program. As you know, at one time the Russians were ahead of us and we were able to take advantage of data derived from reading their telemetry to provide information about their space program which in turn was used to improve our own program. I quote Dr. Pickering here; it is one of the few really tangible bits of evidence where you can claim that this particular bit of intelligence saved that particular amount of money. Unfortunately, we never got it in writing, nor did the SIGINT program receive a check for it, but it is a useful item to keep in mind.

~~TOP SECRET UMBRA~~

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(b) (3)-18 USC 798
(b) (3)-50 USC 403
(b) (3)-P.L. 86-36

TOP SECRET UMBRA

HIGHLIGHTS

DR. TORDELLA

TOP SECRET UMBRA

It is appropriate, I think, [redacted] spent on the Russian problem, that I spent as much time as I did on the Russian problem. What is the future in this area? First of all, I think that the future will not only be a heavy burden for you to carry, and will pose a very heavy burden on many of you, but I think it is also a very promising vista, particularly in these days of treaties—the SAL, Strategic Arms Limitation discussions—and others. Our summit negotiators and our policy makers are going to need precise information. The principal sources for that technical information—and I am sure that the Russians are never going to open their territory for inspection—the principal sources are going to be photography and SIGINT, and they are going to have to be worked together.

[redacted] On the Soviet emplacement operations photography may well be a primary source. But for the testing and for precise information on the behavior of the weapons the Community will be heavily dependent, if not almost totally dependent, on the information that can be derived from the analysis, the study, and the actual exploitation of the telemetry. I think that is one of the major jobs that you will have to continue to give painstaking attention.

I would like now to say a few words about other equally important problems, in a broad sense, and certainly vitally important problems for people who are directly concerned in these areas.

First, let us look at China.

TOP SECRET UMBRA

6

7

TOP SECRET UMBRA

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(b) (3)-P.L. 86-36

(b) (1)
(b) (3)-18 USC 798
(b) (3)-50 USC 403
(b) (3)-P.L. 86-36

~~TOP SECRET UMBRA~~

HIGHLIGHTS

DR. TORDELLA

~~TOP SECRET UMBRA~~

It would only be a guess, if I said that all of us in the SIGINT business were responsible for saving twenty thousand or thirty thousand American lives, but I think we were, because various traps were avoided, various actions were initiated, and many economies effected as a result of having an accurate picture of the disposition and actions of the opposing units.

With respect to the two conflicts that we have unfortunately been involved in since World War II—North Korea and Viet Nam—many of you in the audience can tell this story better than I can. Everybody here is aware of the contributions that were made from SIGINT, and SIGINT here definitely means both ELINT and COMINT. You are aware of the fact that in Korea the air movements and air battle were largely controlled by information provided from intercept of North Korean materials. And in South Viet Nam we [redacted]

~~TOP SECRET UMBRA~~

8

9

~~TOP SECRET UMBRA~~

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- (b) (3)-18 USC 798
- (b) (3)-50 USC 403
- (b) (3)-P.L. 86-36

individual parts. Intelligence analysts in this city benefit tremendously by looking at photos, by looking at HUMINT, by looking at SIGINT, and by studying open source materials. In some arenas SIGINT contributes sixty, seventy, eighty, ninety percent; in other arenas SIGINT may contribute only ten, twenty or thirty percent. But in all the arenas it is important that all of the various parts be looked at individually and collectively so that they can support and reinforce one another. When the problem is worked this way, when the various sources of intelligence data are melded constructively and wisely, then it is true in such a case that the resulting intelligence picture as a whole is greater than the sum of the individual parts.

Thank You.

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Now, as I said at the beginning of my remarks, this is dealer's choice, and I made my choice of some of the things that I think were tremendously important and represented major contributions that have been made from Signals Intelligence.

I think that the partial record I have cited is one that should enable you to stand tall and proudly.

I would like to leave you with one other thought, and it is that the Signals Intelligence contributions are an important part, but they are still only a part, of the whole intelligence picture. I have said from this platform once or twice before, in intelligence, particularly and paradoxically, is the whole greater than the sum of the parts. It occurred to me while I was thinking about this anomaly a couple of days ago that plywood offers a good analogy. If you look at what is in plywood, you find several thin strips of wood, none of them particularly strong. You can take them individually and measure the strength of each and add them all up, and that should be the strength of the whole. But it isn't, because once you bond them by properly interleaving them you find that those pieces because of the way they are placed and bonded are collectively stronger than the sum of the

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- (b) (3)-P.L. 86-36