Corrections for draft
No. 2. Made in two copies

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Senior School of the Marine Corps on the subject of "Communications Intelligence

Communication
and Security" it came with pleasure that I accepted the invitation

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you aware of the role that these two branches of the science of cryptology
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My talk being divided into three periods, and I will give you
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First, then, for historical background.

I opened my remarks by referring to the science of cryptology as a vital

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Insert to p. 1

Soon after the close of World War II, the commandants of our various service schools began to ask the Cryptologic activities of the Armed Forces for lectures to tell their student officers something about our cryptologic activities during the war. There was at first a question as to the advisability of lifting the security veil sufficiently to permit discussion of the subject, but in time an affirmative decision was made. The official views of the Naval War College on the matter were stated in a letter dated February 1946, from the then President of the college, Admiral R. A. Spruance, to the Chief of Naval Communications, Admiral F. E. Stone. In commenting upon the fine presentation made by a certain speaker, Admiral Spruance said:

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Many times in the course of the past forty years I've had occasion to wish that I knew the old gal's address so that I could write her, as a first indorsement to her basic communication, the single word "Concur."

This being a TOP SECRET lecture it will appear a bit incongruous that I should begin by reading from a source which you'll all recognize--TIME magazine. I'll read from the 17 December 1945 issue and I will preface the reading by reminding you that by that date all the war was over--or at least V-E and V-J days had been celebrated some months before. You'll remember the loud clamor on the part of certain vociferous members of Congress who had for years been insisting upon learning and disclosing to the people of the United States the reasons why we had been caught by surprise in such a disastrous defeat as the Japanese had inflicted upon us at Pearl. This clamor had to be met; the matter could no longer be hushed up, they contended, by the need for military secrecy. There had been and still were investigations--a half dozen or more of them, and now there was to be a grand finale Joint Congressional Investigation into the Attack on Pearl Harbor. It was this investigation which not only itself brought into the open every detail and exhibit uncovered by

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I hope I've not tried your patience by such a lengthy preface to the real substance of my talk, so let's get down to brass tacks, and since a bit of history is always useful in introducing a subject belonging to a special and not-to-well-known field, I'll begin by giving you some historical information about cryptology, which comprises two related sciences, that of cryptography, and the other of cryptanalysis. They are but opposite faces of the same coin, for progress in one inevitably leads to progress in the other.

Now, because of the secrecy or cloak of silence which officially surrounds the whole field of cryptology and especially cryptanalytics, it is obvious that authentic information with reference to the background and development of the science in foreign countries is quite sparse; and although after World War II we learned much regarding the accomplishments in this field of work by our enemies, security rules prevent my saying very much in detail about how good or bad they were in comparison with us. Suffice it to say that we looked pretty good in cryptologic affairs; together with our principal ally, Britain, we cryptologists naturally think we won the war, though others seem to have mislaid the peace somewhere.

I can only give a fairly good account of U.S. cryptologic activities up to a certain point of time, and even then I will not be able to say very much about them simply because the story is too long to give in a lecture or even a series of talks. In the course of my talk I will present a number of illustrations of

cryptography and cryptanalysis, some of which form part of my own experience. Modesty would dictate their omission, but because of their possible interest I will use them and will here and now make a general apology for the use of the personal pronoun.

Now may we have the first slide, please. Cryptography and cryptanalysis go back to the dawn of the invention of writing, and here I show an instance of cipher in the Bible. In Jermiah 25:26 occurs the expression "And the king of Sheshakh shall drink after them." Also in Jermiah 51:41: "How is Sheshakh taken!" Well, for many, many years that name "Sheshakh" remained a mystery. There was no such place. But then somebody discovered that if you write the twenty-two letters of the Hebrew alphabet in two rows, eleven and eleven, like this, you set up a substitution alphabet whereby you can replace the letters by those standing opposite them. For example, "Shin," is represented by "Beth" or vice versa, so that "Sheshakh" translates "Babel", or "Babylon." The vowels had to be supplied. Incidentally, mentioning the Bible, one might say that Daniel, who was an early psychoanalyst, but not the first in the Bible-- was also the first cryptanalyst. I say psychoanalyst, because you remember how he interpreted Nebuchadnezzar's dreams.

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If time permitted we could go far back into history to see the earliest beginnings of secret communications and this might take us to the very dawn of the art of writing because there is room to wonder which came first, ordinary, intelligible writing or unintelligible, that is, secret writing. Instances of cipher are found in the Bible, for instance, and we now know that some of the ancient Egyptian hieroglyphic writing was sometimes enciphered. But we pass over the history of the early days of cryptology with the foregoing brief mention. There is, however, one chapter in that history which is worthy of special notice, the story of the ancient cipher device which, in history, records and was

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The beginnings of modern cryptology can be traced back to the days of the early years of the 15th Century, when the science was extensively employed by (4.1#) the princes and chanceries in the Papal states, about 14## I show next an alphabet of that period which is interesting merely because it shows that in those early days they already had a recognition of the basic weakness of what we call

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> "His treatment of the subject matter emphasized the value of communication intelligence to naval commanders, the vital importance of maintaining the security of our own communication intelligence activities, and the necessity for observing the principles of communication security in defense against enemy communication intelligence. I consider that the value to be derived from the indoctrination of senior officers of the Navy in these principles far outweighs any possible loss of security resulting from a partial revelation of our activities in the past war, particularly in view of the disclosures which have been made in the press.

"It appears axiomatic that the full benefit of communication intelligence can be obtained only when all senior officers realize its potentialities for winning and losing battles and wars, and when their actions are tempered by complete knowledge of the elements of communication intelligence, rather than by incomplete and inaccurate information obtained through the channels of gossip."

My talk being divided into three period, I will give you first some of the historical background of cryptology. Next will come a presentation of the manner and the apparatus whereby Communication Security, or for short, COMSEC, is established and maintained; and finally will come a presentation of the basic principles, procedures, machinery, and organization whereby Communications Intelligence, or, for short, COMINT or SIGINT, in British terminology, is obtained, how it may be properly used and safeguarded, and its unrivalled utility as an intelligence weapon in the conduct of modern warfare.

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