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WAR SECRETS IN THE ETHER

Parts I and II

By
Wilhelm F. Flicke

Translated by
Ray W. Pettengill

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National Security Agency
Washington, 25 D. C.

1953

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National Security Agency
Washington 25, D.C.

1953

To the Inquisitive Reader:

The manuscript entitled "Kriegsgeheimnisse im Aether" came to the attention of American authorities in Germany by accident. All rights to the book were purchased for a curious reason and now, some five years later, the National Security Agency finds itself custodian of this property. This translation is issued, by request, in the belief that the document will interest other agencies.

No attempt has been made to verify the author's statements. Mr. Flicke says that his manuscript covering the history of the intercept service down to World War II was lost and had to be reconstructed largely from memory. This reconstruction, in two parts, constitutes the present volume. Part III, bound separately, covers World War II and was written partly from memory, partly from notes made under trying conditions. Readers who chance to have more adequate information on this or that point will, therefore, make due allowance for any dubious statement.

This brings up the question of the author's qualifications and background. Mr. Flicke began his intelligence career in the "Arendt Service" during World War I; from 1919 to 1939 he worked in what was eventually known as "OKW/Chi", where he developed the evaluation section; in 1939 - apparently after getting into hot water by his opposition to the Nazi Party - he was sent to set up the first intercept station of OKW/Chi at Tennenlohe, from there

he went to Libourne, and later to Lauf as technical director of the station; in September 1944 he was transferred to "Funkabwehr" (radio counterintelligence) in Zinna, where he became acquainted with the work against foreign agents and partisans. From the foregoing it is evident that Mr. Flicke saw many of the fruits of German cryptanalysis and that he himself participated actively in most other aspects of the work he describes.

One other factor may be considered. Flicke says that in 1934 General Fellgiebel, then head of the intercept service, commissioned him to write a history of that service; this accounts for his copious notes. Possibly one motive for completing the book was his loyal devotion to the memory of Fellgiebel, who was one of the victims of the purge following 20 July 1944.

"War Secrets in the Ether" attempts to cover large segments of time and space. On the espionage side it affords an interesting check on the "Handbook of Spies" by A. A. Foote; as a revelation of German opposition to National Socialism it lacks some of the dramatic qualities of Gisevius' "To the Bitter End"; nevertheless, the reader may grant that it is significant.

The Translator.

TABLE OF CONTENTS

	Page
To the Inquisitive Reader	iii
Table of Contents	v
Preface [prepared for a prospective publisher]	vii
Foreword of the Author	xi
Part I	
The Beginnings of the Intercept Service	1
Tannenberg	7
The German and Austrian Intercept Service in the East at the Beginning of World War I	24
After the Battle of Tannenberg	27
The Intercept Service in the West and the "Miracle of the Marne"	41
The Deciphering of Cryptograms	48
The Direction Finding Service	53
Polyps and Penkalas	56
The West	61
The Second Half of the War in the East	80
The Zimmermann Telegrams	85
The Intercept Service at Sea	115
The Italo-Austrian War	123
A Second "Zimmermann"	137
The "Judgment of God" and its Explanation	141
The Intercept Service in the Balkans	151
Brest-Litovsk	153
Compiègne	159

Part II

	Page
The German Intercept Service after the End of World War I	163
The Winiker Case	169
The Work of the German Intercept Service 1920 - 1928	175
The Observation of Maneuvers	191
The Intercept Service of Other European Countries	201
Some Remarks on the Technique of the Intercept Service	207
The Chances for the Intercept Service	211
The "Forschungsamt"	219
The Formis Case	233
The Thilo Case	239
The Development of the German Intercept Service and of its Control Station after January 1933	247
The "Intercept Companies"	253
The Literature on the Intercept Service	257
The Armament of Europe after 1933 as revealed by the Intercept Service	261
Hitler and Czechoslovakia	269

PREFACE

The author of the book is a scientist who over a period of twenty-nine years had opportunity to gain deep insight into a special branch of the secret service of all European countries; this branch is known as "intercept service" to only a small part of the public.

Since the invention of technical means of communications -- such as the telephone, telegraph, and teleprinter -- the world has been spanned by a mighty network -- partly visible, partly invisible -- over which messages of all types are speeded almost without interruption. Since the invention of radiotelegraphy the ether has been filled with radiograms whose content extends to all realms of public and private life and gives a reflection of human existence on our planet.

On the other hand, all these radiograms act like a magic motor in shaping the life of mankind. Whoever follows this exchange of information in the ether (and in part over wire lines) knows the course of events in the past, present, and near future as no one else can and has a chance to look into things in a way of which the outsider can have no conception.

The present book draws on this source. It can offer only a tiny fraction of what that source has yielded in the course of the last thirty years. But even this small section will show mankind in what fateful fashion the interception of radiotelegraphy and of other technical means of communication has influenced the course of events.

The contents of this book fall into three periods of time:

1. The period from the inception of the intercept service to the end of World War I;
2. The period between the two World Wars;
3. The period from the summer of 1939 to the end of World War II.

Part I is purely historical in character. It is considered here in order to give a basis for an understanding of the intercept service, and to assure to the treatment of the material a certain degree of completeness.

Part II throws light on the development of the intercept service in European countries, especially in Germany, and is calculated to give many a hint regarding the events leading up to World War II.

Part III, the largest section, shows the decisive role of radio espionage in all its branches during World War II. It reduces the events at the fronts to a position of secondary importance when compared with the invisible, dynamic force of radio espionage in this mightiest of all wars. Here for the first time the most secret matters of the warring states are brought into the light of publicity. This is done in order that the world may know what went on behind the scenes, and so dispel many an illusion which might tend to give this war a semblance of romanticism.

In this third section the present work aims to show to the world, and in particular to the German people, the incredibly frivolous, casual, unscrupulous manner in which Hitler not merely began the war but -- what is worse -- continued it contrary to all laws of reason and humanity after every chance that it might be decided in his favor had long since

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vanished.

This book is intended to help give the peoples the truth;
it is intended as a warning, and so to serve the cause of peace.

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FOREWORD

The Second World War has come to an end; it ended as it necessarily must. An infinite amount can be written about this war, the events leading up to it, and about the domination of the National Socialist system in Germany and its effects abroad. Many things will be explained eventually; many will forever remain veiled in darkness. This book is intended as a contribution to historical research. An attempt will also be made to air many a secret, to furnish an explanation for some things which seem inexplicable. This work is intended to illuminate events of the past thirty years from a point of view from which this has never yet been done and could not be done: namely, from the point of view of the so-called intercept service, i.e., the interception of radiotelegraphy and all other technical means of communication and the decipherment of cryptograms. The book originated in the main during World War II, but its beginnings go back much further. Originally it was intended to be a "History of the Intercept Service and of Illegal Decipherment." The first part, embracing the period from 1908 to 1939, was completed in 1940. It was lost in consequence of the war. Hence, only a reconstruction in rough form from memory is possible.

This work will destroy many an illusion. The period of the great generals, in whose hands armies became chess pieces, is past. In place of armies moved about with happy daring has come the war machine which operates with precision. The man at the helm can guide it, to be sure, well or badly -- according to his ability.

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But the operation is so complicated that he is not in a position to keep his eye constantly on all details of the mechanism. He does not notice things that have gone wrong until they begin to affect the operation as a whole and then it is often too late. In decisive questions he must rely on his collaborators and subordinates, and thus he becomes dependent on their skill, their mental ability, their perspicacity, their ability to grasp intuitively the organic working of this vast machinery. If one little wheel in this mechanism fails, then the result of his work becomes questionable. On the other hand, these failures can give the helmsman of the opposing side chances of decisive importance and can suddenly place him in a position where he merely needs to grasp the opportunity. Whether success or failure results, is quite independent of the personality of the general and of his merit. The general himself becomes a tiny wheel in the machine.

This work is intended to serve the truth and hence to serve peace. The more we strip war of its romantic charm and reduce it to a basis of fact, the more strikingly does its horror appear to us. Along with the heroism of the soldier we see the frightful, destructive force of the war machine of modern states. And that forces us to turn away, and to recognize that war is not the father of all things, but that it merely destroys what is positive and is able to create only what is negative. And if, in the course of centuries, the positive has grown up again and again out of the negative, the credit is not due to war but to the creative powers innate in mankind. Advancing these powers means at the same time declaring war on war. And that happens when we strip from it its veil of romanticism and the

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charm of adventure.

I deliver this book to the public and the critic with the assurance that all things mentioned herein are based on facts. Possibly here and there a name or a rank or a date may be wrong. This is not a vital matter; only the happenings as such are significant. Most of my notes had to be made from memory after I had seen and studied the authentic documents. Moreover, all this was done at the constant risk of my life.

This work means neither to praise nor to accuse, neither to glorify nor to judge. It is intended only to aid in finding the truth.

THE AUTHOR

Summer 1945

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WAR SECRETS IN THE ETHER

WILHELM F. FLICKE

1945

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PART ONE

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THE BEGINNINGS OF THE INTERCEPT SERVICE

The endeavor to learn what is in the opponent's mind and to draw advantage from it has always been very important in the history of mankind in peacetime and particularly in wartime. During thousands of years only the methods have changed. In the days when there was no technical medium for conveying thought over great distances, the only existing possibility was either to overhear the spoken word or to intercept - or at least have a look at - messages transmitted in writing. To guard against this latter possibility, secret writing was invented. The history of the last three thousand years is full of examples of great successes in statesmanship or in military enterprises which were due solely to the fact that the statesman or general concerned was able to organize cleverly and to maintain for a considerable period of time a method of spying on the transmitted thoughts of his opponents. Cleopatra, Alexander of Macedonia, Caesar, Napoleon, Metternich, and many others owed their successes to the extensive use of this type of spying.

However, the practical possibilities were narrowly limited, and great individual cleverness was necessary in this work in order to arrive at the goal.

In the middle of the nineteenth century, when the Morse telegraph came into use, soon followed by the telephone, new technical possibilities of attack resulted by switching-in and listening; this quickly produced a new situation. The invention and use of

radiotelegraphy, with the possibility of picking up anywhere at any time the radiations of a transmitter working at any point whatsoever, increased the possibility of interception in a way hitherto undreamed of. The hour when radiotelegraphy was born was also the hour of birth of illegal listening-in, i.e., of the so-called intercept service.

There were two countries in Europe in which the espionage service had been especially cultivated for centuries: France and Austria-Hungary. Consequently, these were the two countries which first recognized the importance of technical means of intercepting communications and took corresponding action.

Prior to World War I Austria had several occasions to test out this new means of gaining information.

During the crises which arose in 1908 between Austria and Italy in connection with the annexation by Austria of Bosnia and Herzegovina all Italian radio traffic on the continent and at sea was intercepted by the Austrians. At that time Austria began regular cryptanalytic work, and in this way was able to get valuable insight into Italy's attitude; this proved of great value for Austrian foreign policy.

In 1911, when war broke out between Italy and Turkey over Tripolitania and Cyrenaica, the Austrian intercept service had an opportunity for the first time to prove its worth in the military as well as in the political field. Since the Italians had set up several relay stations for traffic between Rome and Tripoli, where the first Italian landings were made, the Austrians had a fine opportunity to intercept all transmissions more than once - and

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therefore very completely. The radiograms with military dispositions from the homeland, and the reports from the theater of war were all intercepted and deciphered so that the course of the operations in Libya could be followed day by day by the Austrian intercept service. This was the first time in history that the course of military operations between two opponents could be followed move by move by a neutral third party using technical means at a distance of hundreds of kilometers.

When the war in Tripoli took an unfavorable turn and Turkey lost its last possession in Africa and therewith its dominant position in the Mediterranean, an opportunity was offered the nations in the Balkans to shake off Turkish rule. This resulted in breaking up Turkey in Europe. The Balkan League, consisting of Serbia, Bulgaria, Greece, and Montenegro, which had been formed meanwhile, declared war on Turkey in October, 1912. The Bulgarians were victorious at Kirk-Kilisse and Lule Burgas; the Serbians at Kumanovo; the Greeks occupied Salonika. On 3 December a truce was made.

For the Danube Monarchy the course and outcome of the military actions and of the entire development in the Balkans were of interest. Therefore, Austria followed the radio traffic with close attention and again had opportunity to make successful use of this new means of gaining information, this time, to be sure, working to some extent with Italy. Austria and Italy put through the formation of an independent Albania. In the preliminary Peace of London, 30 May 1913, Turkey ceded to the allies all territory west of the Enos - Midia Line.

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But a quarrel arose among the allies respecting the conquered territories. The Balkan League broke up. In bloody battles the Bulgarians were driven out of Macedonia by the Greeks and Serbs. Romania and even Turkey, which won back Adrianople under Enver Pascha, took the field against Bulgaria. A redistribution of territory took place in the Balkans, and once more Austria had the keenest interest in following the course of diplomatic and military events in this area. For the fourth time within five years Austria had a chance to get practice in interception and in cryptanalysis. At the peace conferences of Bucharest and Constantinople the new map of the Balkans was drawn.

Prior to World War I France had less occasion to engage in radio interception, but it watched all wire lines leading into foreign countries and particularly the exchange of foreign diplomatic telegrams passing over these lines. In the French Foreign Ministry there was a cryptanalytic section which worked with good success on the solution of the secret writings used by foreign governments and their representatives. For instance, even before the outbreak of World War I the French had solved the cryptographic system in which messages were exchanged between the Foreign Office in Berlin and the German Ambassador in Paris. When the long telegram containing the declaration of war on France was transmitted to the German Ambassador by the Foreign Office in Berlin, the French first deciphered the dispatch and, after they had taken cognizance of the content, so garbled important passages in the original that the German Ambassador could at first

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make nothing out of the telegram he received. Only after divers inquiries was he able to get matters straight. In this way the French gained valuable time.

In the Deuxième Bureau of the French General Staff there was, even before World War I, a desk charged with following all foreign radio traffic (especially German and Italian), in order to have an idea of the normal radio situation and of the changes occurring in case of military complications. The use of radiotelegraphy in the armies of Europe had even then assumed considerable proportions and would probably increase considerably in any coming war. But this raised the question of the extent to which it would be possible to gain insight into the situation on the enemy side by observing his radio traffic. A prerequisite was to watch this traffic in peacetime, to recognize the types of traffic, the use of ciphers, and any methods of camouflage, and by so doing to maintain contact, so to speak.

These chances and possibilities had been recognized both in France and in Austria before the beginning of World War I. And both countries had made preparations in time. As in the French Deuxième Bureau, there was in Vienna in the Evidenzbuero a desk for watching foreign army radio traffic, while in the Foreign Ministry in Vienna and in Paris, bureaus had already been set up which were engaged in the decipherment of the cryptograms which were customary in the diplomatic correspondence of other states.

In Germany to be sure, the General Staff thought of such possibilities, but down to the outbreak of World War I had undertaken practically nothing. Even in the Foreign Office nothing

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had been done in this direction which was worthy of mention. In England at the Foreign Office the decipherment of cryptograms had been attempted some years before the beginning of World War I, and good results had been achieved. In Russia, on the other hand, no attention had been paid to this matter.

This then was the situation respecting the intercept service and cryptanalysis at the beginning of World War I. At that time people did not suspect the proportions which interception would assume during the course of this struggle.

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TANNENBERG

Heavy, gloomy, the towers of the Tannenberg Monument once towered against the sky of East Prussia. Grand and powerful stood behind them in those days the spirit of General Hindenburg, a symbol, as it were, of a force which must necessarily wreck anything that endeavored to attack it. The Battle of Tannenberg had become, since 1914, a symbol for the German people. Much has been written and spoken about this battle, but only little about the decisive factor in this mighty action. Tannenberg - a symbol! Even for one who knows! For it was at the same time a symbol of the ease with which small causes can unloose great effects, of the rapidity with which a great success can be achieved, if by accident the human inadequacy of wholly secondary and insignificant persons on the other side opens the way. Tannenberg - a symbol of mighty superiority and at the same time a symbol of fateful chance.

The Battle of Tannenberg was the first in the history of man in which the interception of enemy radio traffic played a decisive role. This is all the more remarkable since the intercept service of the Germans at that time was not yet systematically organized, and the intercepted radiograms often represented the results of chance occurrences.

After World War I a series of books was published which, among other subjects, dealt also with the Battle of Tannenberg. The chief ones were: Hindenburg's "Aus meinem Leben," Ludendorff's "Erinnerungen," General Danilov's "Russland im Weltkrieg," and the German

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Archives publication "Der Weltkrieg 1914-18" In the three last-named publications the interception of radiograms of the Russian Army before and during the battle is discussed; but nowhere is it discussed fully. In the German Archives publication the intercepted Russian radiograms are touched upon briefly; but there are many sentences attempting to prove that all the Russian radiograms intercepted at that time had no influence whatsoever on the outcome of the battle.

What are the facts?

At 1400 hours on 23 August 1914 the new head of the German Eighth Army, General von Hindenburg, and his Chief of Staff, Major General Ludendorff, arrived in Marienburg and assumed command. The Eighth Army, which was to defend East Prussia, was composed on that day of an Eastern Group (I Reserve Corps, XVII Army Corps, and First Cavalry Division) on the Nordenburg-Insterburg line, and a Western Group (mostly the XX Army Corps) in the region of Tannenberg. The I Army Corps was being transported by railroad from the Eastern Group via Marienburg to the Western Group.

The Eastern Group was facing the Russian First Army (General Rennenkampf) consisting of the XX, III, IV, and II Army Corps plus five and one-fourth cavalry divisions; the Western Group was facing the Russian Second Army (General Samsonov), consisting of VI, XII, XV, XXIII, and I Army Corps, plus three cavalry divisions. The two Russian Armies formed an Army Group under General Shilinskij.

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The Germans had the following radio communications; Two heavy radio stations at the Army Headquarters, one heavy and two light stations in the First Cavalry Division, making a total of five mobile radio stations for the entire Army. In addition there was one radio station each in the garrisons of Königsberg, Graudenz, and Thorn.

Just what radio equipment the Russian Army Group had and how it was allocated cannot be accurately stated; it seems, however, that most of the staff headquarters down to the corps staffs were outfitted with radio stations. At the outbreak of the war there was one radio company each in I, II, IX, and XV Army Corps in European Russia, as well as in the Caucasus Corps. As can be seen from the above, I and XV Corps belonged to the Russian Second Army, and III Corps to the Russian First Army. Each of the companies which had been organized in the years immediately the outbreak of the war had at its disposal at least six radio stations.

General Shilinski's objective was - according to directives of 13 August - to make a decisive attack in which the First Army was to surround the German left wing (the Eastern Group) and prevent its retreat to Königsberg, while the Second Army was to advance into East Prussia south of Königsberg in order to cut off the enemy's retreat to the Vistula and to attack him in the rear.

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The German Army Staff Headquarters obtained information on this objective of the Russians through an order which was found on a Russian officer who had fallen in the battles around Gawaiten on 20 August. This order contained an extract from the above-mentioned directive of General Shilinskij.

Almost simultaneously with the arrival of this order in the German Army Staff Headquarters, a Russian radiogram was intercepted which mentioned this attack and contained an attack order for the Russian IV Army Corps (which was attached to the First Army). This telegram was, therefore, a confirmation of the order found on the fallen Russian officer.

On the evening of 23 August General von Hindenburg's operational plan was essentially complete. The entire Eighth Army was to be concentrated for the attack on the Russian Second Army. The XX Army Corps was already organized, primarily only for defense purposes. The I Army Corps - being transported by railroad - was to be stationed to the right of the XX Corps, to attack first the left flank of the enemy, and then the rear. The principal part of the XVII Corps and the I Reserve Corps (until then in the Eastern Group) were to march in a southerly direction and attack the right flank of the Russian Second Army. The two lastnamed corps were at that time still at a distance of about three day's march. Only the cavalry division and a small portion of the infantry of the XVII Corps were to remain behind to face the Russian Niemen Army.

How far this plan was capable of execution depended, on the one hand, on General Rennenkampf's tactics when he discovered the departure of the two German army corps and, on the other hand, on the ability of the XX Corps to maintain its position until the concentration of the Eighth Army.

On 23 August the battle began along the front of the German XX Army Corps, where the Russians started to attack. The Germans at first maintained their positions, but - to reserve their strength until an actual crisis - retreated somewhat on the 24th. On this day several radiograms were intercepted, which among other things, gave information on the line of march and the mission of the Russian XIII Army Corps. This Corps was to circle around the left flank of the German XX Corps and appear in the rear of the Corp's 37th Infantry Division.¹

The Germans succeeded in avoiding this encirclement without too great losses on their side.

On 25 August they continued with the concentration of the

¹ The two radiograms which were intercepted on 24 August at 0500 and 0555 hours were as follows:

To the Commander of the XV Corps.

The Corps will deploy along the Komusin-Lykusen-Persing line till 0900, at which time attack is desired. I shall be in Jablonica. Klujew (-XIII Corps).

To the Army Chief of Staff

The XIII Corps will go to the support of General Martos (XV Corps) and will deploy along the flank and rear of the enemy at 0900.

Eighth Army troops. On this day General von Hindenburg intended to leave for the front early in the morning, meet the head of the I Army Corps, General von Francois, in Montawa* and acquaint him with the existing situation.

Before his departure from Marienburg a radiogram was handed him which had been intercepted in the night of August 24-25. This radiogram, which was not enciphered, but had been sent in plain text, contained (a thing which until then had never happened) a complete operational order of General Rennenkampf to the IV Army Corps. From this intercepted radiogram General von Hindenburg obtained information on the future aims of the Russian First Army, which up till then had been completely unknown to him. Among other things, the radiogram stated that the First Army would not reach the Gerdauen-Altensburg-Wehlau line until 26 August with the southern flank (IV Corps) at Gerdauen. Also the marching goal for the 25th was given, which was to be several miles east of the above-mentioned line.¹

* Montawa not found, there is or was a Montowo in Western Poland. [Ed.]

1 The radiogram contained the following:

To General Aljev, IV Corps.

The army will continue the attack. On 25 August it will reach the line of Wirbeln-Saalau-Norkitten-Potauren-Nordenburg; on 26 August the line of Damerau-Petersdorf-Wehlau-Allenburg-Gerdauen. The river divides the XX and III Corps; the Schwirbeln-Kl. Potauren-Allenburg road belongs to the III Corps. Chan Hussein Nachitschewanski (2 Cav. Div.) is to proceed in direction of Allenburg before the army front and in the sector between Pregel and the Parkehmen-Gerdauen-Bartenstein line; north of it Rauch (2 Cav. Div. Guards). Crossing of Pregel is mission of XX Corps.

Hindenburg now knew that for the present Rennenkampf was no menace. Therefore, in the course of the day he was able to decide to decrease still further the number of troops which were facing the Russian First Army and to withdraw the entire XVII Army Corps toward the south.

Hindenburg now went over to the I Army Corps. On his way down there, when he was passing Löbau, another intercepted radiogram of no less importance was handed to him. This time the organization and destination of the Russian Second Army were completely revealed. This radiogram, also in plain text, was dated 0600 hours 25 August and contained an order of General Samsonov to the Russian XIII Army Corps. To be sure, this radiogram was somewhat garbled. The intercepted contents were as follows:

"After battling along the front of the XV Army Corps the enemy corps retreated on 24 August in the direction of Osterode. According to information.....the land defense brigade by Gilgenburg.....The First Army pursues the enemy further, who retreats to Königsberg-Rastenburg. On 25 August the Second Army proceeds to the Allenstein-Osterode Line; the main strength of the Army Corps occupies: XIII Corps the Gimmendorf-Kurken Line; XV Corps Nadrau-Paulsgut; XXIII Corps Michalken-Gr. Gardiene, Boundaries between the Army Corps on advance: between XIII and XV the Maschaken-Schwedrich Line; between XV and XXIII, the Neidenburg-Wittigwalde Line. The I Corps to remain in District 5, to protect army's left flank..... The VI Army Corps advances to the region Bischofsburg-Rothfliess, to protect the right flank. To protect station Rastenburg the 4th Cav. Div., subordinate to VI Army Corps, will remain in Sensburg to observe region between the Rastenburg-Bartenstein Line and Seeburg-Heilsberg Line. The 6th and 15th Cav. Div..... staff quarters 2 Army in Ostrolenka."

Thus when General von Hindenburg arrived at 1300 hours on 25 August at the General Command Staff of the I Army Corps, he was completely informed respecting the mission of the Russian Second Army for that day. It was decided to begin the German attack on the following day. On the same day at 2030 hours the orders for the army to attack on 26 August were released in Riesenburg.

One must admit that it was a piece of unusually good fortune for the Germans that both these radiograms were intercepted on the morning of 25 August, that is, at a time when critical decisions had to be made. It seems the more remarkable that these two radio grams were the only ones of any considerable length and with contents of decisive importance to be sent in plain text by the Russians, and intercepted by the German radio stations, during the entire period from the beginning of the war to the middle of September, 1914.

On 26 and 27 August the I and XX Army Corps prepared to attack the left flank of the Russian Second Army. The German divisions which had advanced the farthest toward the right (the 5th Landwehr Brigade and the 2nd Infantry Division) met with stiff opposition, and for a while the situation was critical. On the forenoon of the 27th, Russian radiograms were intercepted which disclosed that the Russians were expecting reinforcements or perhaps had already received them, among others, the Third Guard Division from Warsaw (which was attached to the XXIII Army Corps). This information contributed to the fact that General von Francois (I Army Corps) no longer deemed it possible to proceed eastward

to Neidenburg in order to sever the enemy's connections in the rear, but decided to turn the attack in a southerly and southeasterly direction.

The left wing of the XX Army Corps, which on 26 August had not been drawn into the battle to any great extent, was attacked by the Russians early in the morning of the 27th. The attack gradually spread out more and more toward the north and finally reached the German Third Reserve Division, which was on the left of the XX Army Corps. A Russian radiogram which was intercepted by the Germans now gave information on the attack mission of the opposing Russian XV Army Corps and revealed its intention to encircle the German left wing. Other radiograms disclosed that the Russian XIII Army Corps intended to support this attack toward the right of the XV Army Corps, and to proceed toward the rear of the German Third Reserve Division.

While these encounters were progressing, the German XVII Army Corps and the German First Reserve Corps made forced marches toward the battlefield. On 26 August at Gross-Bössau they fought with the Russian VI Army Corps which then retreated southward. Simultaneously, a Russian radiogram was intercepted from which the German Eighth Army Staff Headquarters assumed that the Russian II Army Corps, which was at Rennenkampf's left wing, had been proceeding northward from Mauer lake and was now supposed to march in a southerly direction, in order to help Samsonov.

That the Russian II Army Corps was proceeding northward from Mauer Lake was already known from reports of the Lötzen garrison, but that it was supposed to advance in order to support the Second

Army was news. The German First Cavalry Division, which was stationed in the region of Schippenbeil, now received orders to halt the advance of the enemy corps along the Rastenburg-Korschan Line.

The German Army order for 28 August was signed by Hindenburg on the evening of 27 August. Later in the evening information was received that Russian troops from the south had arrived in Allenstein. There was thus the possibility that the Russian XIII Corps was striving to reach the north in order to join the approaching II Corps. The Army order which had just been signed was now immediately replaced by a new one which, among other things, ordered the XVII Corps and the I Reserve Corps to Allenstein.

On 28 August at 0700 hours Hindenburg and his staff arrived in Frögenau to direct the battle from there. Great tension prevailed at Army Headquarters. They were entirely in the dark as to the enemy's purpose at Allenstein. This group still had complete freedom of action.

At 0800 hours radiograms of the Russian XIII Corps disclosed that it was marching from Allenstein southward to Hohenstein, and that its vanguard would arrive at 1200 hours in Grieslienen, five kilometers north of Hohenstein. Its purpose was to aid the XV Army Corps.

On the basis of this knowledge, an order was immediately sent by airplane to the German I Reserve Corps to proceed at all speed, regardless of everything, by the shortest possible route, to the Stabigotten-Grieslienen Line (northeast of Hohenstein).

Even while the battle against the Russian Second Army was still at its height, the attention of the Germans was called to the pending operations against the Niemen Army. On the 28th a Russian radiogram announced that the II Corps (left flank Corps of the First Army) was to begin the retreat toward the frontier and to be transported by railroad. This move, however, did not take place.

Early in the morning of 29 August, an incomplete radiogram was intercepted, which stated as follows:

"Because of heavy battles of Second Army the Army Command orders supporting reinforcements... and advance of cavalry... ."

(General Rennenkampf had received orders on the morning of 28 August to proceed with his left flank to the support of the Second Army. This radiogram was apparently an order of Rennenkampf to one of his Army Corps. A later radiogram, however, interrupted the advance again).

The above-cited radiogram confirmed what they had been expecting in the German Eighth Army Headquarters. During the night of the 29th a number of radiograms were intercepted which mentioned the encirclement of Königsberg from the south. On the morning of the 30th one such radiogram gave information that the head of the Russian II Army Corps on his countermarch (which thus had been ordered for a second time) was to demolish completely the railroads and telegraph wires west of the Königsberg-Rastenburg line, including Korsche and Rastenburg. This last-mentioned radiogram made it possible for the German Eighth Army Staff to devote

further attention to the remnants of Samsonov's Army.

All these Russian radiograms were intercepted by the German garrison radio stations Thorn and Königsberg, but also in part by the two heavy stations of the Eighth Army Staff, and were immediately translated and transmitted to the German Army Command. The German Command therefore knew not only the strength and organization of the enemy, but also his objectives.

It is very interesting to note how differently the importance of these intercepted Russian radiograms was estimated in the post-war period. Ludendorff mentioned this fact very casually in a subordinate sentence: "...we had received an intercepted enemy telegram which gave us a clear picture of the enemy's moves for the following days." Ludendorff forgot that there was not only "one" radiogram but that several dozen were intercepted during the course of operations which revealed the situation of the enemy.

Hindenburg himself, in his book, "Aus meinem Leben," which appeared in September 1919, did not devote even one word to the radiograms; on the contrary, he described the course of the Battle of Tannenberg in such fashion as to give the definite impression that he was in the dark as to the enemy's objectives and organization.

The Russian General Danilov spoke of an "unpardonable negligence" in the Russian radio service, and declared that the imperfect communication service had been the chief reason for the catastrophic outcome of the battle.

The German Archives publication declares: "...On the whole the German Army Command viewed the intercepted radiograms as an

extremely welcome source of intelligence. The Army Staff because of them, was temporarily, and even immediately before the beginning of the Battle of Tannenberg, advised of the objectives of the enemy in a way rarely possible in wartime." And in connection therewith, the German Archives publication immediately strives to save the face of the German Command by continuing: "But the critical decisions and orders for the battle, according to the unanimous statements of all participants, were made independently of the information which became known on the morning of 25 August through the radiograms. One cannot assume that without these radiograms the course of the battle would have been different."

To this one can only reply: The general has not yet been born, who, after winning a battle, would admit that he had won it thanks to a well-functioning intelligence service. Since the victory at Tannenberg had become a symbol for Germany, the "unanimous statements of all participants" could not of course be any different. Undoubtedly the dispositions for the battle were made before the first radiograms were intercepted. But during the course of the battle the knowledge of the contents of the intercepted radiograms played a decisive role. The development of the battle without these radiograms would very definitely have been entirely different.

Now we shall try to find out why the Russians sent their communications in plain text. To use plain text for such important communications as the two radiograms of 28 August was a mistake of the gravest kind. However, an examination of the circumstances

on the side of the Russians gives an explanation. The Russian communication system operated very imperfectly during the battle. As a result, the army orders reached the staffs of corps at the front too late. Many times they did not receive their orders until about 1000 hours of the same day on which the orders were effective; under such circumstances the troops could not enter into action in the designated formation until almost noon. Very seldom were there telephone connections, which was partly due to the fact that there were insufficient cables. For this reason, where there were radio stations, these were preferred for the transmission of communications, as was the case between the army leaders and the army corps.

In itself this would not have been dangerous if the radio traffic had been handled so as to prevent enemy interception, but this was not done.

The radiogram of General Samsonov to the XIII Army Corps at 0600 hours, 25 August was of an urgent nature since it pertained to the operations of the same day. It was sent as a priority message. There were no wire connections. One can assume that time did not permit the encipherment of this message; in the last analysis, however, the reason seems to be that in the XIII Corps no radiograms could be deciphered; they had no cipher key! Hence an enciphered radiogram was simply out of the question in traffic with the XIII Corps.

This almost unbelievable state of affairs was the reason why, when the above-mentioned corps headquarters attempted to listen in on the traffic of a nearby corps with the Army Command and order

to obtain desired orientation, this traffic could not be deciphered by them and as a result could not be read. For example, on 26 August the XIII Army Corps was ignorant of the position and mission of the VI Corps, although they had in their possession intercepted radiograms from the traffic of this particular corps!

Since various Russian corps headquarters did not possess facilities for deciphering radiograms, it is probable that this was also the case in the Russian IV Army Corps, to which General Rennenkampf sent the above quoted fateful radiogram in plain text.

General Danilov, Quartermaster General at the Russian Headquarters, in his book "Russia in the World War," gives a different explanation for the use of plain text in radiotelegraphy. He writes: "The use of radio was something entirely new and therefore unfamiliar to our staffs. Moreover, our enemy was guilty of the same errors, and now and then we were successful in intercepting their plain-text radio messages and orders. But this does not absolve us from the charge of unpardonable negligence."

Danilov considers the faulty functioning of the Russian communications to be one of the major causes for the catastrophic outcome of the battle. Although the Russians at times made active use of radio, this means of communication was, nevertheless, not utilized as it should have been. On the Russian side there was not the experienced leadership which is required for the maintenance of a dependable radio network. When General Samsonov betook himself on the morning of the 28th to the XV Army Corps and sent the major portion of his staff with his radio station across the Polish border to Ostrolenka, all radio traffic on the

part of his army ceased. All connections, both with the Chief of the Army Group and with the VI and I Army Corps were thus interrupted, wherewith the command of operations on the Russian side on this day practically ceased. On 31 August the Battle of Tannenberg came to an end.

In German military literature these circumstances have been carefully passed over or greatly reduced in importance. But anyone who has ever experienced how thirsty a command in a critical situation is for reports regarding the enemy, whoever knows how difficult and nervously exhausting it is to have to reach decisions without a knowledge of the enemy's situation, such a person will entertain no doubt that the knowledge of the content of the Russian radiograms decisively influenced the course of the actions in the Battle of Tannenberg.

The Germans had learned something from the happenings along the ether waves at the Battle of Tannenberg which was supposed to be put to practical use during the "Battle of the Masurian Lakes". Before the German attack on the Russian First Army began, the Germans wanted to tie up the important enemy reserves stationed farthest to the north - (east of Königsberg) - so that these could not be moved to the south where the German attack was in progress. Since no troop contingents were available to hold this large enemy reserve, the German Eighth Army Staff resorted to strategy. In the forenoon of 7 September, the radio station at Königsberg sent a radiogram in plain text as follows:

"To the Corps Chief,

Guard Corps,

Priority telegram.

Tomorrow the Guard Corps will join the...
immediately west of Labiau, parts of V
Army unloaded....(here follows a series
of garbles).....

Army Staff Headquarters."

The radiogram was intercepted by the Russians and the strategy succeeded. This is the first known case of purposely misleading radio traffic during World War I. The contents and the precise wording of the radiogram had been well thought out. The Guard Reserve Corps, which had shortly before arrived in the theater had in reality a different mission, but still was the northernmost army corps within the German attack organization; hence the mission designated in the radiogram could be possible. The V Army Corps, which was stationed in France, was garrisoned in Posen in peacetime, hence its presence in East Prussia appeared possible. The Russian Army Command had also believed for a long time that this V Army Corps belonged to the Eighth Army, although they did not know where it was located.

THE GERMAN AND AUSTRIAN INTERCEPT SERVICE IN THE EAST
AT THE BEGINNING OF THE WORLD WAR I

When the war broke out in August 1914, there was no fixed organization on either the German or the Austrian side for intercepting the foreign army radio traffic which immediately developed. The field regulations for German telegraph troops did foresee the possibility of listening-in on foreign radio traffic during those periods when their own radio traffic was dormant, in order to get some insight into the situation on the other side. Actually this work had never been practiced at all in peacetime maneuvers, and when the war broke out, nobody thought of undertaking the task.

At that time there were two rather large fortress radio stations in eastern Germany which had relatively little traffic of their own and consequently were in a position to listen to the enemy in periods of light traffic. These were the fortress radio stations at Königsberg in East Prussia, and at Thorn. Moreover, there was in Breslau the radio station of the German Eastern Europe Institute, which was likewise employed for military traffic after the war began but was used only for transmission. Entirely on their own initiative a few operators attempted soon after the outbreak of the war to listen to Russian army traffic as a sporting proposition, so to speak; it was not long before the first messages were intercepted but no one knew quite what to do with them because there was no regulation stating what should be done

with such radiograms. In those days radiotelegraphy was a novelty both in Germany and in Russia. People were astounded at the technical progress which made possible wireless transmission of information over rather great distances, but they did not yet understand how to make sensible use of this technical advance in order to gain information. In the Russian army the idea had not even become general that messages sent out by radio could be heard just as well by the enemy, and on the German side the idea was utterly foreign in lower and medium commands that one might be in a position to shape or alter one's own plans on the basis of intercepted traffic. Military thinking tended to consider one's own operation on the basis of the orders issued to be a fixed factor which could in no wise be influenced by any messages which might be intercepted.

The Russian operational orders intercepted in the last phase before the Battle of Tannenberg were forwarded to General von Hindenburg by motorcyclists solely on the personal initiative of the chief of the German fortress radio station at Thorn. The impression which this produced on the German High Command was, so to speak, the birth hour of the German intercept service, since now for the first time were the value and the possibilities of this service recognized.

The Austrians had already advanced somewhat further in this field by the time the war began. Here again there was no special organization for intercepting foreign radio traffic; here, too, they employed existing fortress radio installations for intercepting foreign traffic as a side issue. In the main, the stations at

Krakow and at Przemysl were the ones involved. However, [redacted] was already rather more system in the organization of the work and, above all, provision had already been made before the war for passing on and utilizing intercepted enemy messages

In this way the Austrians in the very first days of the war had definitely geared this new branch of the service with their Secret Service.¹ Moreover, the cipher section had taken up its work as soon as the war began, so that within the first fortnight it was able to read enciphered Russian radiograms.

In Germany, on the other hand, the cryptanalytic service limped so badly that it was almost half a year before the first regular work in this field began to take shape. It hardly seems credible that, in spite of the example of the Austrian intercept organization and in spite of the stimulus which must have resulted from the intercepting of Russian radio traffic after the Battle of Tannenberg, a fixed German organization for the systematic monitoring of foreign radio traffic did not come into existence until nearly one year after the beginning of the war.

1 (Geheimdienst = Cryptographic Section of the Imperial Chancellery.)

AFTER THE BATTLE OF TANNENBERG

The Russian radiograms intercepted before and during the Battle of Tannenberg had suddenly pushed the value of the intercept service into the foreground with the German command. Only now the people began to say that, apart from the radiograms of the armies of Rennenkampf and Samsonov, many Russian radiograms had been heard which might have been valuable in the execution of one's own measures, had they been exploited in time. The fortress radio stations were now instructed to do intercept duty in periods when they were free or had light traffic, and even the army stations were told to start hunting for Russian messages, insofar as their own traffic allowed. Naturally that was a rather pitiful measure - compared with the practical possibilities - for it resembled a suggestion rather than an order, and gave the receiving operator no hints at all as to how he should do his job, since for this there should have been a systematic search of all wave bands which might come into account. The effect for the moment was merely to arouse interest in this work, while any practical results depended on the intelligence and skill of the momentary heads of the stations. The only thing that was covered by regulations was the forwarding of intercepted telegrams so that at least there was no longer any doubt on this point. The radio intercept service was attached at that time to Section IIIb of the General Staff and was controlled from there, insofar as this word can be applied to conditions of those days. Only during the second half of 1915 were special receiving stations for monitoring foreign military traffic

set up with the army groups and only from this point on was any real, systematic coverage of the enemy possible. As the German Army Command had attacked and solved the question of intercepting and evaluating enemy traffic in the fall of 1914, if it had introduced a special organization for this purpose in the east by the end of 1914, i.e., at a time when the enemy was making one mistake after the other in this field, it is highly probable that a number of decisive operations might have been added to the list of German successes.

The Chief of the German General Staff in the years 1914-16, General von Falkenhayn, stated later in his memoirs: "The radiograms intercepted by us permitted us to follow the movements of the enemy on the eastern front, day by day, week by week, from the beginning of the war nearly to the close of 1915, and we adapted our measures to this circumstance."

Conrad von Hoetzendorf, who describes the activity of the Austro-Hungarian Headquarters in World War I, remarks in Volume IV of his memoirs that "from the time when the Supreme Army Command was set up in Neu-Sandec (i.e., since the middle of September 1914) it was able to get information in an ever more exact and dependable manner regarding all measures which the enemy ordered by radio." At another point he says: "In this way a basis for the performance of the command functions was created which no previous war had ever known... ."

In Volume V of his memoirs, Conrad von Hoetzendorf emphasizes the fact that whenever the words "according to reliable reports"

were used in connection with orders of the Supreme Command of the Austro-Hungarian troops, only such reports were to be understood as had been obtained from intercepted radiograms; this was never admitted in order not to betray this highly esteemed source.

Colonel Nikolai, Chief of the German Information Service in the years 1914-1918, writes; "The intercepted Russian telegrams constituted a very trustworthy source of information. Of course, the orders were enciphered, but the cipher system was very simple and was rarely changed; consequently, it was easy to read the radiograms."

The common conduct of the war in the east by the German and the Austrian Armies was dominated at the outset by the point of view that Russian attacks should be beaten off by active defense until, after the expected decision in the west, adequate forces could be brought from the west to pass over to a decisive attack in the east. The Austrian Army was to make a thrust from eastern Galicia against the Russians still on the march, the Austrian First and Fourth Armies began the advance on Lublin and Scholm; defeated the Russians near Krasnik and Komarov; but, due to the failure of the Austrian Third Army near Lemberg, had to withdraw in the face of superior Russian strength during the first half of September to the Carpathian Mountains and behind the Wisloka. The German Army Command now decided to support the Austrian front by detachments from the Eighth Army located in East Prussia, which had participated in the Battle of Tannenberg, and, using these detachments, to set up a new German Ninth Army in Upper Silesia, with its right wing extended to Krakow. Hindenberg took over its command.

The removal of large portions of the Eighth Army in order to set up the Ninth Army had to be carried out with great caution in order not to reveal to the enemy that East Prussia was now left with very feeble protection. Consequently, the Germans decided to try deceiving the enemy again by radio. Since the movements of the transports could not remain entirely concealed, it was decided to bluff the Russians by pretending that a new German thrust from East Prussia was impending. Two radiograms relating to such unloading were intentionally sent in garbled plain text under the assumption that the Russians would intercept these messages. Actually, the trick worked.

Meanwhile, the Russians had recognized the danger of sending plain text by radio, and the Supreme Command of the Army (the so-called "Stavka") sent out instructions by radio on 14 September to the effect that as a matter of principle military arrangements should only be sent completely enciphered in the future. However, this instruction came too late. The Austrian cryptanalytic service had already gotten so well started that the Russian digit cipher was solved on 19 September. Henceforth, reading Russian radiograms no longer caused any difficulty.

Meanwhile, the German initial assembly in Upper Silesia was completed.

In their retreat the Austrians had expected the Russians to pursue them sharply; however, after reaching the San the Russians took a very slow pace and finally stopped at the Wisloka.

This conduct of the Russians posed a serious riddle for the

Austrian Army Command, especially as it was learned from intercepted messages that the Russians were constantly receiving reinforcements. From these doubts the Austrians were relieved on 23 September by an intercepted radiogram of the Commander of the Russian Ninth Army, General Litchizkij, who ordered the XVI Corps to return from the Wisloka toward the San to Stany on the following day. With this, the assumption that the Russians would continue frontal attacks was dismissed.

Meanwhile, at the Austrian army commandpost, reports were coming in from agents who spoke of strong Russian cavalry forces in the area between the Nida and the River Vistula. Soon, however, the radio intercept service showed that here it was a question of the Novikov group, which consisted of only one cavalry corps but regarding which the Russians had been spreading exaggerated reports. An intercepted radiogram from General Novikov to the Russian High Command in Warsaw, dated the morning of 24 September, revealed to the Austrians the complete results of his reconnaissance work and also showed his intentions clearly.

It was probably the first time in the history of warfare that the result of enemy reconnaissance was revealed so swiftly to those against whom this activity had been directed. While the Russian cryptographers in Warsaw were busy solving the radiogram, the Austrians were working on the same text. The telegram was intercepted at 0840 hours. Toward noon it lay deciphered before the Austrian High Command. At 1600 hours the German Army Command had been apprised of the content and was able to make good use of the data in its dispositions for 25 September.

The day following, Austrian and German divisions stood ready for battle in their new positions. In this phase the Austrians again intercepted an important order of the Command of the Russian Ninth Army; it reads as follows:

By command of the Supreme Commander and with reference to the impending movements I order the withdrawal tomorrow, the 26th, of the troops of the Army behind the Wisloka and the leaving behind of only small rear guards at the Wisloka. The troops are to be quartered in the areas previously occupied by them. The guard corps will remain in the area Kolbuszowa - Kupno, which it reached today; its advance guard is to approach nearer.

With this the situation was clarified for the Austrians. It was obvious that the Russians were undertaking regroupings for a new operation. The Germans now began to urge the immediate beginning of an offensive, in order to attack the Russians during their regrouping. The Germans had their eyes on the middle reaches of the Vistula.

In the night before 28 September the Austrians intercepted the Russian order for a shift of the Ninth Army behind the Vistula, below the mouth of the San. It was now clear that the Russians planned to shift their main weight from Galicia to Poland.

On 28 September the German Ninth Army and the Austrian First Army, which joined it to the right, started an advance on Ivangorod north of the lower Vistula. South of the Vistula the Austrian Fourth, Third, and Second Armies moved forth on 4 October toward the San. The Austrian intercept service had received from Russian radiograms full information regarding the Russian disposition. The Army Section under Mackensen undertook the protection of the German left against an encircling movement which threatened from the north.

For a time the German-Austrian offensive progressed well. Soon, however, the intercepted radiograms showed daily more and more clearly a shift of the Russian Ninth, Fourth, and Fifth Armies from the San to the middle reaches of the Vistula, and of the First and Second Armies from the Russian "northwest sector" to the area north of Warsaw. Other Russian dispositions betrayed the fact that the Russians were assembling an enormous force for an advance against the heart of Germany from the Ivangorod - Warsaw area. No less than 94 Russian divisions were to attack 52 German and Austrian divisions at most, in which connection it should be remembered that the effective strength of a Russian division was far greater than that of a German or Austrian division. In the event of an attack by this military force, a catastrophe for the armies of the Central Powers was inevitable.

On the basis of information obtained from intercepted Russian radiograms, the Germans decided to retreat. Without the Russians noticing anything, the German and Austrian units broke contact with the enemy and retreated, to the Russians' surprise, to the line of the Carpathians - Krakow - Upper Silesia. Hindenberg was now appointed Commander-in-Chief of all German forces in the east. Mackensen took over the Ninth Army; it was moved to the area of Thorn and prepared for a new thrust at the right flank of the advancing Russian army group. Protection of Upper Silesia was taken over by the Austrian Second Army, which was moved from the extreme right wing of the Carpathian front to the region north of Tschenschau. From East Prussia all available forces were sent to the

Ninth Army.

On 12 November Mackensen started his advance between the Warthe and the Vistula. On 13 November the Russian disposition for a general advance on the following day by the "Panzer" deep into Germany was intercepted and deciphered the same day. From this it was evident that the Russians had no idea of the extent to which their northern flank was threatened; they thought that the German Ninth Army which was attacking amounted to a corps at most.

On 19 November the Russian Commander-in-Chief, Grand Duke Nikolaj Nikolaevich, radioed that the hour had come, when by exerting all their energies the general attack would be crowned by success.

The next day brought the Germans and Austrians a sudden surprise. A communications officer of the Russian Fourth Army announced that the old cipher key had come to the knowledge of the enemy. A new cipher was introduced. The Russians had captured the German cipher key, had deciphered a few messages, and had learned in this way that their system was known to the opposition.

There resulted a painful situation for the armies of the Central Powers, since the great struggle had reached its climax. The right wing of the Russian army near Lodz was almost encircled; capitulation was awaited hourly. And at this moment the best reconnaissance means of the Germans failed.

The German Command now had to operate without knowledge of the enemy situation. This was all the more disagreeable since from the Warsaw area new Russian forces were coming up. In a few days

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the fortunes of war changed. The German group, which was supposed to encircle the Russians, was itself encircled. It consisted of the XXV Reserve Corps under the command of General von Scheffer-Boyadel and the Third Guard Infantry Division under the command of General Litzmann. The result was the well known battle of Lodz, in the course of which the annihilation of the German group seemed almost certain. In ice and snow, without any supply, it was obviously fighting in a lost position.

At the Austrian and German cipher bureaus they were working feverishly to solve the new cryptographic system used by the Russians. There were direct teleprinter connections between the two offices, and every meaning which was recovered by one or the other was exchanged immediately. In the evening hours of 21 November solution of the Russian cipher was accomplished, and with it a solution of a number of intercepted radiograms. From these the troops forming the encirclement ring were recognized. But it was also discovered that this ring was not absolutely closed but that there was a relatively weak spot near Brezeziny which was closed only by Russian cavalry units. This fact was reported by radio to the encircled German groups, and General Litzmann undertook the task of breaking through the Russian ring near Brezeziny.

Meanwhile, the Russians had already prepared means for transporting the encircled German units off into captivity. To the surprise of everybody General Litzmann's break-through was a success, and the encircled group was able to escape although its heavy materiel was left behind. This feat later won for General Litzmann the nickname, "The Lion of Brezeziny." Nobody made any

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mention of the cryptanalysts whose work made it possible to recognize the weak point in the Russian line. If they had not succeeded with their decipherment, then the whole German group would have been taken off into Russian captivity along with the "Lion."

Before and during the winter battle of the Masurian Lakes (4-22 February 1915) the interception of Russian radio traffic by the German intercept service was of decisive importance. This time the Russians sent very little in plain text, but the German cryptanalytic service, which had been set up meanwhile, succeeded in solving the cryptographic system used by the Russians, the so-called "Service Code" (RSK), and thus deciphered all Russian radiograms.

The German attack under the leadership of von Hindenberg was directed against the Russian Tenth Army. From the line Johannisburg-Lötzen - Gumbinnen - Tilsit, the German Eighth and Tenth Armies attacked and with encircling operations forced the Russians back to the forest of Augustowo where the remnants of the Russian Tenth Army had to surrender. All Russian countermeasures against the German advance were recognized promptly by the German radio intercept service.

Since the Battle of Tannenberg Ludendorff had become so accustomed to making his dispositions on the basis of intercept results that he became impatient and nervous if these radio monitoring reports failed to come, were delayed or gave little information. His regular question was: "Any radiograms?" Later on he took it as a matter of course that the Russians would have to send informative radiograms and that the German cryptanalytic service was

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to decipher them. If for a time no messages of importance were intercepted, then he used to growl that they had not been paying enough attention and would they kindly do better. If a new cryptographic system was not solved in a very short time, he called it a "damned mess" and said the cryptanalysts had become "absolutely stupid."

In spite of all the German successes, the situation in the east remained serious. On 22 March 1915 the fortress Przemysl fell, after having been encircled by the Russians. In the Carpathians the Austro-Hungarian front laboriously warded off Russian attacks. Only because of the smooth functioning of the Austrian intercept service was it possible to recognize impending dangers promptly and to take countermeasures.

In March 1915 the Austrian intercept service had ascertained that in the area between Tarnow and Gorlice the general military situation on the enemy side was such that this front sector seemed the one suited for a break-through operation. The Austrian Chief of General Staff, General Conrad von Hostendorff, proposed therefore to General Falkenhayn the inauguration of a large-scale offensive starting from this area. The plan of operations was developed in consultations between the two. It was necessary to handle the assembly so that the enemy should notice nothing by intercepting German and Austrian radio traffic. Radio schedules and the handling of all other camouflage and secrecy measures were worked out by the Austrians, and it was actually possible to execute the entire German-Austrian assembly unnoticed by the Russians. Colonel General von Mackensen took command of

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the German Eleventh Army, which was to effect the break-through.

On 1 May 1915 the German attack began; on 3 May the Russian front had been pierced. The Russian armies were caught in a vast rolling-up operation in a northeasternly direction and were either defeated or driven away. In the second half of May came the crossing of the San. Early in June Przemysl was recaptured; on 22 June Lemberg was occupied. Mackensen was appointed General Field Marshal. In mid-July the German armies in Poland passed to the attack. In quick succession during August and September the Russian fortresses Ivangorod, Warsaw, Lomza, Kowno, Novo-Georgievsk, Oswiec, Brest-Litovsk, and Grodno fell.

During this entire operation the Austrian and the German intercept services experienced their period of glory. The swift change of battlefield forced the Russians to make constant use of radio-telegraphy. Of course, they were always changing their ciphers, but the Austrian cryptanalytic service had gotten so well tuned to Russian cryptographic systems by this time that every new key was solved in a few days. And in this the Russians often afforded wonderful assistance; often they sent one and the same message in the old key and in the new one. Or they would send an inquiry in the evening in the old key and get the answer from the same station on the following day in the new key (which had gone into effect at midnight). Often they sent messages in plain text with references to enciphered messages, etc. All this facilitated cryptanalysis. Day by day the German and Austrian intercept services received so many Russian radiograms that in every phase of this operation the Command of the Central Powers was almost completely orientated regard-

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ing the enemy. In view of the existing strength ratios, it is absolutely impossible that the German-Austrian summer offensive of 1915 could have succeeded as it did if Russian radio traffic had not constantly betrayed the Russian measures.

The prompt reaction of the German and Austrian Command to measures undertaken by the Russians came so often and in such a persistent manner that it could not fail to be noticed by the Russians. In Russia, however, they could find no other explanation than the suspicion that treachery was always involved. The cry, "Treason!" ran through all Russia and the Russian Army, and a search for "traitors" began everywhere. Every Russian officer with a German or a German sounding name now appeared suspicious. A number of them were deposed; many were court-martialled. It went so far that finally this fury had to be stopped by cabinet order of the Czar. At that time no one in Russia got on the track of the actual "traitor!" And in that fact lay the great tragedy for the Russians; for in those summer days of 1915 the entire campaign was decided and decided against them. And that was the opening act of the revolution of 1917

Late in September 1915 the front ran along a line from Czernowitz almost due north to Dünaburg and from there along the Dvina to the Gulf of Riga. On the Russian side, the Grand Duke Nikolaj Nikolaevich was relieved and the Czar resumed Supreme Command of the Army himself.

The eastern front subsided to a war of position.

Early in October 1915 began the great German-Austrian offensive in Serbia which led at the end of November to the complete

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collapse of Serbian resistance. Early in December Serbia had been almost completely cleared of Serbian troops. The Russians now decided on a diversional offensive to aid Montenegro, which was then seriously menaced. They began to bring units from southern Russia to the eastern Galician front, and to shift the Ninth and Eleventh Armies thither. These measures, however, were very soon revealed by the Austrian intercept service which was able to deduce therefrom an impending Russian offensive against eastern Galicia.

In this tense situation the command of the Russian southwest front on 2 December forbade all radio traffic until further notice. The measure was correct, but it came somewhat too late, since too much had already been betrayed. Three weeks later (20 December, at eight in the evening) Russian radio traffic started up with a new cipher (now the thirteenth); however, this cipher had long since been solved because the Russian Third Army, which did not belong to the Russian "southwest sector," had begun working with it on 14 December. The so-called New Year's battle was not a success for the Russians; the exertions made were in vain; Montenegro was not saved.

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THE INTERCEPT SERVICE IN THE WEST

AND THE "MIRACLE OF THE MARNE"

When the war began in 1914, there were two countries which sought to shape the fortunes of war in their own favor as quickly as possible by a swift, powerful thrust far into enemy territory and by crushing hostile armies. The Russian armies were to fight decisive battles in East Prussia and then advance quickly on Berlin. In the west the German armies were to advance through Belgium and northern France and deliver a crushing defeat to the French army somewhere east of Paris.

There is a certain irony in the fact that, at the very time when in the east the Russians, by clumsy use of radio, were exposing themselves so disastrously that the course of the battle of Tannenberg wrecked their entire plans for the campaign, the Germans in the west should make the same mistake with the same results -- namely that, although the war continued for years, the fundamental idea had already been hopelessly wrecked. In the east it was the Battle of Tannenberg; in the west the Battle of the Marne.

There are few battles in military history regarding which so much has been written as about the Battle of the Marne. There are many names for it; one of the best liked among the French was "The Miracle of the Marne." People have sought and found all sorts of explanations for the seemingly inexplicable bogging down of the German advance, and they have tried by clever reasoning to figure out what the course of the Battle of the Marne would have been if

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this or that measure had been taken. On the German side Lieutenant Colonel Hentsch of the Supreme Command of the Army came off worst; he had to accept the role of scapegoat because ostensibly he called for the German retreat without compelling necessity. People contented themselves with this explanation because it sounded as if the Battle of the Marne had really "almost" been won.

In 1928 the Polish Lieutenant Colonel Szieszynski, and shortly afterward the French Colonel Calvel, lifted the curtain, inasmuch as both of them gave out some information from the archives of the French Deuxième Bureau. These were little memoirs which were not given to the public but had only a limited distribution. In Germany they were not published at all but were passed over in absolute silence. These glimpses into the French secret archives gave an explanation of the "Miracle of the Marne," which was no miracle but only the logical result of very commonplace and factual matters.

The German war plan had consisted in advancing with a strong right wing through Belgium and then by a gigantic sweep eastward to the left, thrusting south past Paris, and surrounding and destroying the French armies in a grandiose, encircling battle. With that the entire campaign was to be decided. The German right wing was made up of the German First Army under Colonel General von Kluck; to this army belonged a cavalry corps under the command of General von der Marwitz.

Immediately after the beginning of operations, an active use of radiotelegraphy began on the German side. Since the Germans had done practically nothing with radio intercept before the war, they could have no idea of the effect which the use of radiotelegraphy

42
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by armies in the field would have on the opposite side. Consequently, camouflage measures were very inadequately developed. The use of station call signs, for example, was such that all radio stations of an army had call signs beginning with the same letter. Moreover, there was no change of call sign or of wave length. Therefore it was possible after a short time to recognize a given radio station as belonging to this or that army by its call signs.

To this we must add the astonishing lack of discipline in radio operation on the part of the German station personnel. The radiograms were not enciphered (or deciphered) by the sender (or recipient), i.e., not by the staffs which were exchanging messages; the staffs turned the messages over in plain text to the radio stations where the cipher materials were located. The messages were enciphered here by the radio officer of the station and were then transmitted. If we consider the lack of experience in transmitting, receiving, enciphering, and deciphering radiograms, it is clear that a chain of errors must be the result; frequently the receiving station requested repetition of part or all of the radiogram; sometimes merely of a single cipher group or of a word. Impatient persons sometimes requested the answer in clear.

Study by the French of the numerous messages intercepted soon permitted a division of the intercepted stations into the following three groups:

- a. Stations, each of which was in communication with a number of receivers - always the same ones; among these were recognized the stations of the higher echelon command; their correspondents were recognized as stations of their subordinate units.
- b. Stations of those units which were constantly

or often active; these were interpreted to be stations of cavalry divisions operating on French or Belgian soil.

c. Stations of the lower echelon command, which operated rarely and obviously belonged to units whose staffs rarely changed location; these were the radio stations of army corps and of infantry divisions.

Accordingly, a mere checking of radiograms and station call signs allowed the French information service to differentiate quickly:

Call signs of stations belonging to staffs of armies,

Call signs of stations to be considered as belonging to staffs of most of the cavalry divisions,

Call signs of stations which were to be considered as belonging to staffs of some army corps and infantry divisions.

The fact that various cavalry divisions belonged to definite corps was easily recognized because the station call signs of divisions subordinate to the same corps began with the same letter. What was even more important was that the call sign of the station of the staff of a cavalry corps could be recognized by the fact that it was the only station within a group of radio stations which regularly communicated with all other stations having call signs beginning with the same letter.

This allowed the French to recognize four groups of control radio stations, each of which belonged to a cavalry corps; the divisional stations of each corps had call signs beginning with the letters "S", "G", "L", or "D". "S" operated in Belgium, "G" in Luxembourg, "L" in the Woevre plain, and "D" in Lorraine.

These findings were soon confirmed by various radiograms in plain text which were intercepted by the French.

Generally the messages were enciphered. Nevertheless, from time to time single words of plain text were encountered; these were either geographic terms or words which the recipient had not understood. Radiograms were intercepted repeatedly which were entirely in plain text, and sometimes even bore the signature of the originator in clear. Thus, after a few days, it was known that General von der Marwitz commanded the corps whose staff radio station had the call sign beginning with "S"; while General Baron von Richthofen commanded the corps whose staff radio station used a call sign beginning with "G".

From an intercepted radiogram sent in clear (by a station with call sign beginning with "L"), it was learned that two cavalry divisions had forced their way into the Woevre Valley, and were moving toward Verdun via Malavillers and Xivry-Circourt, where one of the divisions had its staff quarters.

The French had committed their intercept service in full, even before the beginning of the war, and were following German army traffic attentively. After a few days they had a perfectly clear picture of the operational structure of the German army in the west. It was of greatest importance for them to follow the movements of the German right wing on its way through Belgium in the direction of Paris.

The above-mentioned cavalry corps of von der Marwitz was relatively well supplied with radio equipment, and consequently used it extensively.

There would have been no objection to this in view of the situation and of the rapidity of the advance. What was very

risky was the fact that these radio stations sent a vast number of messages in plain text giving locations, troop designations, movements, plans, orders, and commands. In between, enciphered messages were sent, but they were all quickly solvable because they referred to the content of the plain-text messages. Sometimes there was a question in clear, while the answer was sent in cipher. This made it possible for the French to solve the cryptographic system in the shortest possible time. In the course of 14 days, the French intercept service picked up some 350 radiograms from the cavalry corps under von der Marwitz alone, and through these they were informed not merely of all movements of this corps, its plans, and its geographical distribution, but regarding the whole German First Army of von Kluck, and the Second Army of von Bülow adjoining to the south.

The French intercept service did not fail to note the movement of the German First Army toward the north to avoid being outflanked by the French Sixth Army of Maunoury; furthermore, the overexpansion of the German front and the resulting gap between the First and Second Army, which could only be filled by the cavalry corps of von der Marwitz, could be quickly recognized by the French intercept service.

The cavalry corps of von der Marwitz was supposed to effect a screen between the areas of the German First and Second Armies. But what the troops tried to accomplish in carrying out their orders was utterly ruined by the German radio service, for the transmitted radiograms gave the French an absolutely clear picture of the situation. That gave the French and English the possibility

of breaking into the above-mentioned gap on 8 September, since they knew precisely the weak places in the German front. This threatened to encircle the army of von Kluck, and to outflank the army of von Bulow; and this circumstance was decisive for the recall of the German front.

It is not true that Hentsch ordered the retreat without cogent reasons in a situation which was favorable for the German troops, and that the Allies were surprised and followed only hesitantly; rather, the penetration by the Allies gave Hentsch occasion to recommend withdrawal to the Aisne. On the French side, the fighting units were indeed surprised by the change in situation but not the higher command, which had a precise view of events on the enemy side during the entire course of operations because of the intercepted radio traffic.

With the outcome of the Battle of the Marne, the German attempt to gain a quick decision in the west had failed. The resulting war of position and the subsequent superiority of the Allies in materiel decided the entire course of the campaign in the west.

THE DECIPHERING OF CRYPTOGRAMS

In the course of the preceding descriptions, there has been repeated mention of the fact that the Austrians, French, and Germans broke the cryptographic systems used by foreign governments or armies to render their communications safe from unauthorized reading. In lay circles, any such decipherment of foreign ciphers is always regarded as a kind of "black art" where one works by magic recipes. That, however, is not true; instead, the art of decipherment rests on exact scientific foundations. To render the nature of this work somewhat intelligible to laymen, an attempt will be made below to give some clarifying explanations.

First, a few words on the question of what a cryptographic system is. We may remark here that in this connection secret writings produced with chemical ink, which can only be recognized by some chemical or physical procedure, will not be considered here. Nor can we treat here cryptographic systems found in antiquity when a long strip of parchment was rolled around a conical staff, inscribed across the laps and then removed, so that the strip appeared to be covered merely with mysterious signs and could only be read by the person who, as rightful recipient, possessed an absolutely identical staff around which he wrapped the strip in the prescribed manner. Only such systems will be described as can be transmitted by technical means (by radio or by wire).

Cryptographic systems of the last mentioned type were likewise used in olden times. One of the best known was invented by Julius Caesar, who substituted for each letter of the alphabet

either a group of digits or of letters, and thus transformed the open plain text into a cryptogram which consisted merely of a long series of digits or of letters arranged in seemingly meaningless fashion.

This type of cryptogram could not be solved until it was learned that every language is constructed according to definite mathematical laws, i.e., that the frequency of occurrence of the individual letters in any language differs and is subject to the laws just mentioned. In the German language, for instance, the letter E occurs most frequently; then, at considerable intervals, follow the letters R and N, then D and T, then S, and so on. Accordingly, one merely needs to substitute the corresponding letters on the basis of the frequency of the cipher elements appearing, and he can in this way solve a considerable portion of the cryptogram; the remainder comes as a matter of course.

During World War I this type formed the basis of many cryptographic systems; indeed, it was often used in the same way that Caesar used it; for this reason it is also called "Caesar."

In Germany during the Middle Ages, an abbot by the name of Tritheim invented a cryptographic system in which, instead of replacing single letters by secret elements, he replaced syllables, endings, word stems, prefixes, etc. This resulted in a great multiplicity of secret elements occurring in a cipher, and the problem of solution seemed to have been rendered much more difficult, until people became aware of the fact that a fixed regularity underlay the occurrence of endings, prefixes, and the like, with respect to their frequency of occurrence. After that

even this type of cryptogram could be solved.

People now went on to the use of the so-called multiple values (variants), i.e., instead of assigning one secret element for the most frequently occurring letters, endings, prefixes, etc., they now assigned several. But the art of cryptanalysis also found ways of solving these cryptograms. Little by little an entire science developed, both with respect to the creation of new cryptographic systems and in respect to their cryptanalysis. They created the system of the reenciphered "Caesar" or "Tritheim" through the addition of specific groups of numbers to the cipher texts, and in this way transformed the so-called "open" cryptograms into "concealed" cryptograms; this did for the moment veil the frequency of the cipher elements occurring, and prevented recognition of the cipher elements as such. People invented the "box" transposition, the "comb," the "Raster," (grille) the "double box," and then reenciphered these with a limited or an infinite "additive sequence," i.e., by a correspondingly long chain of digits. They also invented the "open" or "concealed" code by numbering the entire vocabulary of a language from 00001 to 99999, for instance, according to a definite system; or they sometimes used groups of letters instead of groups of digits. When the limits of the individual code groups were effaced by reencipherment, then the cryptanalysis of such a message clearly caused considerable difficulty.

But let the resulting ciphers be what they might, the science of cryptanalysis always found ways of solving them after a while, because every cryptographic system conceals within itself a number

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of possibilities of solution; these have to be tried, until one finally encounters the one and only correct possibility. It is simply a question of making the number of possibilities so great, when setting up the system, that the unauthorized decipherer needs such a long time to try out these possibilities, that, practically, there will be no useful result; with a really complicated cryptographic system, the numbers of possibilities to be checked runs into the billions.

The solution of cryptographic systems is in most cases facilitated by errors in their use. In World War I, for instance, it frequently happened that a station receiving an enciphered message could not decipher it completely and asked the sender: "Send 0317 in plain text," which was sometimes actually done. Or in case of change of key: "We have not received the new code books yet; please repeat in the old code." By comparing the two transmissions, it was often possible to solve the key. Sometimes requests were made in plain text and the answers were sent enciphered, or vice versa. In these cases one generally knew the approximate content of the message, and that helped greatly in the task of cryptanalysis. The number of such compromising errors was so great that we could take a long time telling about them - so we shall only suggest that in most cases the quick solution of an enemy cryptographic system was possible only because of errors made.

In the use of cryptographic systems, the Russians at that time were so unskilled that the recipients of radiograms often asked whether there had not been a mistake in the encipherment or wheather this

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or that group was correct. The Austrian cryptanalysts, on the other hand, were already so adept at solving Russian ciphers that they would often have been in a position to help the Russian addressees decipher their own messages.

Once in a while an original Russian cipher book (code) was captured. In this case it was not necessary for them to make any analytic decipherment, since they could go about decoding at once, using the captured material.

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THE DIRECTION FINDING SERVICE

Today every schoolboy knows the essential things about direction finding. At one time - in 1915 - this invention was a novelty, and at first an English rather than a German novelty. Soon after the beginning of the war the English had developed the system of "direction finding," that is, of fixing the direction in which a transmitting radio station was located; and they had put it to use against the floating units of the German navy. Direction finding stations were not introduced into the German army until about the end of 1915.

Since the radio service in all armies was tending more and more toward the principle of secrecy (not merely regarding the content of the radiograms dispatched, but also regarding the location of the transmitters), while determination of the location of an enemy station was of great importance, since it always coincided with the location of a unit staff, and the determination of the territorial distribution of radio stations likewise gave clarity regarding the front organization of the enemy, henceforth direction finder stations were coupled with all radio intercept stations. The sum total of their direction finding readings made possible the determination of the location of transmitters within a fourth of a square kilometer since at that time all armies were using long waves. With this the system of changing call signs, which had been devised to prevent identification of the stations, lost effectiveness. As a rule three direction finding readings from different receiving stations sufficed to determine the spot where the radio station was set up. Since the number of stations

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in the annals of Europe in those days was very small when contrasted with the present, it was almost always possible to identify positively these transmitting stations.

This became really important when troop movements were being carried out by the opposing side. In this way, one could often follow for hundreds of kilometers the movements of radio stations (and hence of the units to which they belonged). This was true in a very significant way, for instance, during the preparations for the first grand Brusilov offensive in the east; later in connection with the support of the Romanian front by the Russians; in connection with the Austrian grand offensive on the Italian front in 1917; and on other occasions.

The French set up their direction finding service (goniometric service) very quickly and in a very perfect fashion; the Italians were also very active in this field. The Russians, on the other hand, limped far behind, and had not gotten beyond some very modest beginnings by the end of World War I.

Looked at practically, direction finding operations in those days were by no means so simple as they are today. At that time there were no maps showing local and magnetic deviations. It was necessary to learn by experience how deviations of the direction finding ray behaved in the terrain lying between the transmitting station and the direction finder. When a direction had been fixed, it was very important to know whether the station fixed lay at a distance of 20, 50, 100, 200 kilometers or more. Such experience had to be gathered and collated.

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Direction finding operations achieved their greatest importance in the naval intercept service. The English in particular scored outstanding successes in determining the movement of German warships, particularly of submarines. Many a German submarine sunk in those days could be credited to the British direction finding service. Moreover, Zeppelin raids were observed constantly by the English with excellent results. The task was rendered easier for them by the fact that the Zeppelins handled their radio traffic on a definite wave length, and worked with a fixed system of call signs. Therefore, as soon as such a call sign was heard, people over there knew at once that a Zeppelin was coming, and they merely needed to follow its course by readings at short intervals, which was easy to do because of the low flying speed of the airships.

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POLYPS AND PENKALAS

By a polyp we understand in zoology a marine animal which catches its victim in its outstretched tentacles in order to eat it. What a "Penkala" is, that probably few people know today. Therefore, it may be mentioned that this was the name of a firm which before and during World War I was producing the first mechanical lead pencils. In its advertising, this firm used a head with an enormous ear behind which was stuck such a mechanical pencil. Beneath was simply the word "Penkala." This big ear of the Penkala poster and the tentacles of the polyp served the Austrian and the German intercept services respectively from early 1916 on as the symbolic designation for a new branch of this service which will be described below.

In the summer of 1915 German engineers near Verdun had captured instruments by the aid of which the French had been intercepting German telephone lines. These instruments had been improved in Germany by the then Postal Councilor Arendt, and they had been used in the war of position, first by the German and then by the Austrian army, to intercept telephone conversations of the enemy. These devices were installed in a dug-out in the front line, and from here insulated wires radiated out which ended in the so-called "search grounds"; these search grounds consisted of metal stakes which were driven into the ground as close as possible to the enemy's system of trenches. Where a single telephone line was used the currents passing through the soil

would encounter one or more of these search grounds, and after being amplified by the attached apparatus were rendered audible. Thus, as if with a magnet, conversations carried over the telephone net of the enemy were attracted, and, by using a switchboard, any number of search grounds could be thrown in selectively to eavesdrop on a definite sector of the front. In the German army these listening posts, which by the beginning of 1916 were installed everywhere along the front, were called "Arendt Stations" or "Polyps"; the Austrians called them "Penkalas" (big ears!).

Since at that time the Russians at the front used almost exclusively so-called single wires, and even in the west single wires were still used to a great extent, the German and Austrian listening stations generally had very good results. While the radio listening service gave the connections, orders, and reports of the higher staffs, the Arendt service supplemented the picture with respect to small units and the front line. The results during 1916 -- especially in the east -- were so abundant that one Arendt station was supplying on the average 15 to 20 pages a day of significant information regarding the enemy. Excellent results were achieved by the Austrians with their Penkalas on the Italian front, where they were always very exactly informed of the situation on

the Italian side.¹

When several such stations fell into the enemy's hands during the summer of 1916 and the listening in on telephone conversations became known, people began to use two wire connections everywhere. It was much more difficult (often impossible) to intercept these. Nevertheless, it took a very long time to make the change and to safeguard telephone traffic at the front - particularly for the Russians - to such an extent that listening in became virtually impossible. In any case, the German and Austrian Arendl services were able from early 1916 till about the middle of 1917 to hear most of the telephone conversations of the Russians up to five kilometers behind the front, and to utilize the content for shaping their own measures. The Russian telephone operators were very loquacious when seated at their instruments. When a Russian telephone operator took over either by day or by night, he began "testing" all his connections by calling up the correspondent stations. Generally he knew the men at the other end of the wire, and a conversation ensued in the course of which the two exchanged experiences, impressions, and observations. Very often they spoke also of official matters. They discussed impending or

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1. It is true that the Austrians did not find out until November 1917 that the Italians, beginning early in 1916, had likewise set up a considerable number of these listening stations. As General Max Ronge states in his book, "Military and Industrial Espionage," the Italians listened in on some 5200 telephone conversations of the Austrians in the sector between Wippach and Rombon. In October 1916 the leader of an Austrian listening station deserted to the Italians, and was able to acquaint them in detail with the Austrian arrangements and to warn them fully. Later on a number of Austrian deserters were employed by the Italians in this listening service on the basis of their linguistic ability.

accomplished reliefs, the question of supply, the spirit of the troops, extension of positions, losses suffered, changes in command, reenforcements received, and the like.

Aside from these bits of private information, very good information could sometimes be obtained from the conversations of the officers, particularly when patrol undertakings were impending, attacks were planned, etc. Precise information was obtained regarding the locations of staffs, batteries, depots, and the like. Artillery observers could generally be heard clearly because they were stationed well forward with their telephones. They gave firing directions; by observing where missiles struck and comparing the figures transmitted, one could soon get the exact location of the hostile battery. From now on it was impossible to prepare for any major military action without its being noted by the Arendt service, since, if an order was given to stop all telephone traffic and this was done, this very measure was enough to attract attention and to indicate that the enemy was making preparations.

Since the telephone lines of the staffs further to the rear were attached to the same switchboards in which lines from the front terminated, induction often made it possible to listen also to those wires, over which extremely informative conversations were carried.

The introduction of the "Polyps" and "Ponkalas" in the armies of the Central Powers signified from the military point of view an unparalleled factor. Since, from the summer of 1916 on, these stations were located at intervals of about 10 kilometers along the

entire front, it was possible to monitor the entire enemy telephone traffic at the front almost without a break. In the east this one-sided superiority continued down to the end of the war; in the west it was equalized since the French and English used similar apparatus to intercept German conversations.

In the eastern theater the practical result of this superiority was that a large part of the troops of the Central Powers could be withdrawn without risk, since there was now no danger of a surprise movement by the enemy. It would never have been possible for the armies of the Central Powers to keep the eastern front stabilized, if they had not had such extensive insight into the enemy situation, due to the results of the radio intercept and the Arendt services, since the strength ratio on the eastern front was in many sectors 10:1 against the Central Powers.

THE WEST

While in the eastern theater the intercept service during World War I resulted in a one-sided German superiority, the situation in the west was quite different. Here it was not the Germans who started using this novel means of gathering information and thus got a head start, rather it was the French who began working systematically and purposefully in this field as soon as political tension began and who derived a corresponding advantage. There were two reasons for this: the first was that at the very beginning of the war the French had at their disposal a fairly well set up system of interception which merely had to be adapted to the new tasks; they already knew the value and the possibility of using this means of gathering information. The second reason was tactical: while the French were operating in their own country and could rely on a closely knit, undamaged wire network and consequently needed to use the radio but little, thus affording the enemy few chances to employ radio interception, the situation was reversed for the Germans. After crossing the frontier the Germans encountered a telephone and telegraph net which had been more or less destroyed or rendered temporarily useless. They either had to set up their own field wires, which took time and on the right wing was hardly practicable due to the swift advance, or they had to resort to radiotelegraphy. This was done to a great extent and afforded the enemy a marvelous opportunity to get practice in interception. After a few days the French intercept service had already gotten

its bearings, and from then on maintained very close contact with radio developments among the Germans.

We have already reported briefly on the French intercept service which became so important before and during the battle of the Marne. Immediately after this fateful battle there followed in the west the so-called "race to the sea". The German attempt to outflank the enemy again from the north called for the utmost watchfulness on the part of the French. Once again the focus of French reconnaissance lay in the intercept service. On the other hand, the French army command tried to create a new situation here by threatening the German right wing. Thus the two opponents kept crowding one another more and more to the north and there resulted the famous "race to the sea."

These movements forced the German army command to make extensive shifts of troops. The French, on the other hand, were faced with the problem of recognizing these movements, their type, extent, and goal, and of doing this in time.

The Germans were still resolved to continue to hold the front in Lorraine and the Vosges by defensive action and to force a decision in the north. The two German "Southern Armies" (the Sixth and Seventh) were withdrawn from the front and replaced by newly activated army units. The Seventh Army, which was in the Vosges, was transferred to the Aisne sector and committed there. The Sixth Army was moved from Lorraine to the extreme German right wing. Thus the Germans succeeded in countering the movement of the French and the English which was extending farther and farther to the north. From

1 to 13 October the battle raged around Arras; by mid-October a new front ran from Noyon to north of Lille.

The removal of the two German armies from the southern flank, their replacement by new units, and their march to the new areas of commitment were recognized in the very beginning by the French intercept service as clearly as one could wish. It was the first time in the history of war that such a movement had been followed by the technical means of radio intelligence. The French also recognized these units as they appeared one after the other in the new areas. That gave them and the English a basis for carrying out countermovements, whereas the Germans had to rely exclusively on reconnaissance by patrols and scouts along the front; thus at best they had success with their reconnaissance only after the hostile units, which had been brought up, had already been committed.

On 9 October 1914 Antwerp had fallen. From the besieging troops thus released and from new units activated in Germany a new Fourth Army was formed in Belgium, which started its advance on 18 October with the purpose of bringing the channel coast under German control. This movement was also recognized promptly by the French intercept service and by the intercept service of the British Expeditionary Army which had in the meanwhile become active, so that appropriate countermeasures could be taken in time. After heavy fighting the German attack was stopped at the Yser. The attempt of the German Sixth Army to break through toward Ypern, which was prematurely betrayed in radio traffic,

was likewise without success. With the end of the battles around Ypern the war of movement in the west was concluded for the time being. The war of position began.

Several years after World War I the French Colonel Calvel prepared for instruction purposes for the Signal School in Versailles a timetable containing all the German army radiograms intercepted by the French intercept service during those months. Upon comparing this table with the operational movements executed by the Allies one recognizes clearly that these results were the basic factor in carrying out countermeasures, and that it was only due to the intercepted German radio traffic that the French and English were able to act so promptly and to eliminate the German threat in the north. What the German intercept service accomplished in the east, the French did here in the west. With remarkable parallelism there took place here an equalization of spiritual forces which determined the outcome of the war back in the fall of 1914.

In the further course of the campaign in the west the forces were equalized in respect to the intercept service, just as the forces on that front had been equalized in other respects. On the basis of experiences in the east, the Germans began late in 1914 a systematic interception of enemy radio traffic. Both sides now developed extremely great activity in this field. There resulted an invisible struggle between camouflage, concealment, and deception on the one side, and the intercept service, evaluation, and cryptanalysis on the other, which was soon carried on by both parties with the most refined methods. This service extended to interception of all technical means of commun-

ication of the enemy, but was concerned primarily with radiotelegraphy and the telephone. As recognition of the danger of using radiotelegraphy for transmitting secret information began to permeate everywhere, people in the western theater began more and more to give up the use of this means of communication. Furthermore the stabilization of the fronts afforded a possibility of extending wire communications. Consequently, the focus of the intercept service in the west shifted more and more to the interception of telephone lines, both on the Allied and on the German side. This duel sometimes assumed violent forms, as for example, in 1915 near Apremont, where mutual interception of the telephone conversations of the artillery formed the tactical basis for the military actions. At times some rather droll situations resulted. Once the Germans had even learned the hour of the impending attack. But instead of learning a lesson from this and being doubly cautious in the use of their own telephones, the Germans made the mistake of passing the time of the expected French attack in plain language by phone, and all countermeasures were adjusted to this point and time. This was intercepted by the French in turn, whereupon the French attack was advanced several hours and was completely successful in spite of all German preparations for defense.

In the autumn battles in the Champagne (22 September to 3 November 1915) and at La Bassée and Arras (25 September to 13 October 1915) the Germans were able to frustrate the intended

break-through of the enemy simply because, through the interception of enemy telephone traffic, they had been in a position to recognize the impending attack and to prepare appropriate defense.

In September 1916 during the battle on the Somme, the French intercepted a German radiogram from which they learned details of the impending great German counterattack in the vicinity of Bouchavesne.

The French Colonel, Givierge, who describes the results of interception during the First World War, says: "The results achieved by deciphering telegrams were unusually great since they made possible the identification of many units. If we glance at the archives, we see that between 5 and 15 December 1917 four movements of divisions were recognized by the aid of this special organ more quickly than would have been possible by any other means of reconnaissance; these divisions were later checked by the statements of prisoners. Moreover, 32 infantry regiments were spotted, whose areas of commitment had been ascertained previously by other means. A radiogram intercepted on 10 December reported to us the presence of an 'attack division' north of St. Quentin; another telegram of 10 December informed us of the presence of General von Erpf, commander of the 242nd division; another telegram of 15 December allowed us to anticipate the German sortie against the Albia Farm; our troops anticipated the enemy and threw him back. A radiogram of 5 December reported to us the change of call sign of a German radio station, and gave us the old and new call signs..."

Of the utmost importance in the intercept service were so-called little things; they often proved of decisive value. In many cases the French discovered and identified German radio stations by the fact that when they changed call signs the German stations did not break the sequence of message number in the headings.

One German divisional radio station (183rd Infantry Division) could always be recognized by the fact that it put the sending time and the word count at the end of the radiogram instead of at the beginning, as was generally done.

Another German station could be recognized by the stereotype formula: "Can you hear all right?", which occurred each time it began traffic with a correspondent. In such cases it did no good to change the call sign.

The French and English were especially successful in listening to the radio traffic of the German Air Force. At the very beginning of the war the German airships were easily recognized in radio air traffic because they all had call signs beginning with the letter "T". Whenever this signal was heard, it was known that the transmitter of a Zeppelin was involved; the position of the airship was then determined quickly with the aid of radiogoniometry. At the beginning of the war these airships cruised over the North Sea and radiocd incessantly to their base in the Helgoland Bight; they reported the spotting of mine fields, submarines, warships, merchant ships, etc. The French kept posted on these matters by listening to these

transmissions over a distance of 700 to 800 kilometers.

During the air attacks on Paris and London, the Zeppelins and large aircraft which carried out the bombardment were constantly requesting bearings from various German direction finding stations. This entire radio correspondence was listened to by the French and English, who thus received directly from the enemy valuable clues regarding the movement and the direction of the German attacks. Moreover, after the English and French direction finding stations had become acquainted with the signals of the German Air Force transmitters, they took the necessary readings and determined the momentary position of the airships.

Toward the end of the war the German dirigibles - like the land stations - changed their call signs almost daily so that it was more difficult to recognize them. But this difficulty was offset by the routine which had been acquired meanwhile by the French and English intercept operators and by the aid of the improved direction finding system.

Interception of hostile artillery aviators was likewise carried on successfully. One system of interception, which was organized particularly for the purpose, yielded a mass of information which permitted the command to orient itself on the following questions:

- a. Intentions of the enemy artillery; recognition of the firing procedure of newly committed batteries and the firing of old batteries getting a range on new targets.
- b. Zones and distribution of fire of enemy heavy artillery.

Interception of this type is not so easy as listening to the traffic of ground radio stations. The planes move very fast; fixing their momentary position in the air calls for great speed and practice on the part of the crew of the direction finding stations. In addition, it is necessary to recognize the transmitters again in spite of the daily change of call signs; moreover, decipherment of the radio dispatches calls for no little effort. In addition, the precise times of the flight must be compared with those of the artillery fire and evaluated. Nevertheless, it was possible again and again to get valuable information and to shape one's own measures correspondingly.

With the introduction of universal military service in January 1916, England manifested the tenacity of its purpose to keep fighting. On the other hand, France appeared greatly weakened both in a military and an economic way. In order to wear down the French completely and thus bring about a decision in the west, the German army supreme command decided to attack Verdun. The attack began on 21 February and continued until September without achieving the desired success. In these battles the intercept service on both sides played an unusually important role. The telephone lines were constantly being damaged by the uninterrupted artillery fire so that there were possibilities of interception by the resultant grounding. Moreover, a new phase began in the war of interception. Everywhere along the front so-called ground telegraphy instruments

were installed. Their introduction had become necessary because reliable use of the telephone had become impossible in view of the destructive effect of the artillery fire. The ground telegraph sent buzzer currents into the earth, and was therefore independent of wires. Of course, it could be heard by the enemy at short distances but not to the same extent as radiotelegraphy. The intercept stations, at which hitherto the listeners had been accustomed to hear and translate oral conversations, now had to shift to intercepting Morse telegraphy, which also offered a possibility for the use of cryptographic systems. The English had constructed a special device for signal communication in the combat zone, the so-called Fullerphone, which they considered secure against eavesdropping; but even this turned out to be subject to interception under certain conditions, so that the struggle in this field never ceased but merely changed in its technical aspects.

The intercept service achieved strategic significance in the west only once on the German side, and that was in February - March 1917. From countless intercepted conversations and telegrams the Germans had ascertained that the Allies were preparing an attack on a grand scale in the Somme area. The areas of attack and the directions of thrust could be clearly recognized. This time the German supreme command actually did draw the correct conclusions from the available information, and immediately before the attack was to begin ordered a withdrawal to the so-called Siegfried Line. In this way, the target was withdrawn from the crushing superiority

of the Entente in materiel, and the attack petered out in empty space. Of course, the Allies had recognized from intercepted German traffic the German intention to retreat, but strangely enough they did not draw the only correct deduction and immediately continue the attack which could have resulted in a very difficult situation for the German troops. Instead, they clung rigidly to their existing plan and missed a very favorable opportunity.

Meanwhile, the French had been making excellent progress in the field of direction finding. As early as October 1914 they had started experiments with direction finding apparatus, and then developed a model which could be used in the field, being held to such dimensions that it could be installed in a vehicle. The rotatable frame had sides two meters long and was located on the roof of the vehicle. The apparatus itself was mounted inside the vehicle.

With this mobile direction finder the French got excellent results. Such direction finding stations particularly proved their worth early in 1917 when the Germans were preparing to retreat to the Hindenburg Line. Long before they started to occupy this defense line, radio stations were set up and put into operation. Of course, that was sheer stupidity because there was no valid reason for operating radio stations far behind the front as it then stood; they could have gotten along very well with the existing wire communications. The fact that

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they did trace up their radio traffic shows that the responsible authorities had not the slightest idea of the danger accompanying the use of radiotelegraphy. They were setting up communications just as might have been done for practice according to the principles employed before 1914. The new radio stations were immediately recognized by the French; readings were taken, and the locations determined, so that in a relatively short time they recognized the exact course of a new German line of defense. The French were also in a position to recognize with certainty the imminence of German retreat operations.

A little while after that the Germans also missed an exceedingly favorable opportunity which the intercept service served up to them, so to speak. In the middle of April 1917 the French under General Nivelle with strong employment of troops and material made an attack on the Aisne and in the Champagne, east of Reims. The Germans intercepted this thrust by a mobile defense, and in heavy fighting caused the French such severe losses that the morale of the French army was badly shaken. In numerous army corps there was mutiny. Troop units and single soldiers were leaving the front, or going over to the enemy.

The German intercept service had its great hour in the west, as one intercepted message after the other revealed clearly the critical situation on the enemy side. In this situation the French front could not have resisted a German attack. But the incredible happened: the German command saw in these events a parallel to those on the Russian front, and expected a collapse of the French power of

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resistance without any action by the Germans. It missed the chance which was never to return, and kept waiting until the French Government and the army command had succeeded in restoring the situation. Petaïn resumed supreme command; the crisis came to an end; the French front again stood firm. America was able to proceed calmly in shipping its divisions and armies to Europe. The Danube Monarchy recognized the hopelessness of the situation, and the idea of a separate peace began to spread there visibly. The Entente had survived the crisis; the scale of victory slowly tipped in its favor.

In respect to the intercept service, the tide now began to turn. Just as the German intercept service in the east had been able to follow the increasing war weariness of the Russian soldiers from early in 1917, so now the French were often able to observe similar phenomena among the German troops, even though not to the same extent as had been the case in the east. The resolution in favor of peace passed by the Reichstag on 19 July 1917, the Peace Note of the Pope, the German reply thereto, the formation of the "Independent Social Democratic Party," the resignation of Reich Chancellor von Bethmann-Hollweg, and many other happenings became the subject of occasional short conversations over the telephone, in spite of all regulations, and these allowed the Allies to infer that there was a general, slow decline in the will of the German troops to resist. This phenomenon was increased as the American troops began to arrive in France from overseas;

conversations on this topic occurred again and again on the telephone, and showed that the Germans at the front were by no means indifferent to this problem. But the most valuable intelligence was gained by the French intercept service in listening to the telephone conversations of German units which were moved from the eastern to the western theater beginning in December 1917. These units had no taste for the war, and the French intercept service was busy seeking such units since their telephone conversations afforded the best information. Nevertheless, the French did not succeed in recognizing from intercepted telephone traffic the impending German offensive of March 1918. This offensive, which broke loose in the morning hours of 21 March, came as a complete surprise to the French, at least as far as its timing and the direction of thrust were concerned. Numerous German troop movements had been recognized by the French intercept service, but in the main very good radio and telephone discipline had been observed by the Germans. Hardly had the front come into movement, however, when the German radio stations again began to send eagerly and to supply the French with excellent material. Foch quickly recognized that the German offensive had been undertaken without adequate, fast moving forces, and he quickly took his countermeasures. After barely two weeks of successful German attacks, the great spring offensive had bogged down.

A few examples may serve to show the importance which was attached to the intercept service even in 1918 - after the danger

of using technical means of communications had been generally recognized.

The French Captain Ccusillan relates that on 6 May 1918, for example, the French station "ZZ2" sent a telegram to station "ZZ1" which began with the words: "The lieutenant and chief of the radio service with the staff of General X. To the chief of the radio service with the staff of General Y." The Germans, who knew, naturally, what divisions were led by these generals, discovered in this way the presence of these units in the sectors involved.

The presence of several Italian divisions on the French front was brought to the attention of the German intelligence service by the fact that an Italian operator made what would seemingly be a very slight mistake. The Italian radio stations employed in France were required to follow French regulations and to accommodate themselves to the French traffic in all particulars. The operator in question made the mistake of transmitting the Italian signal "Y di X" instead of the signal "Y de X" when calling another station. In this way the presence of Italian units on French soil was betrayed.

On 1 June 1918 the French intercepted a German radiogram which they deciphered on the second day following. It had been sent by a station in the region of Roye, and contained the text: "Speed up supply of ammunition even by day, if not subject to observation." This telegram, which suggested an impending action, was a warning signal for the army of

General Lambert, and made it possible to prepare the means employed by General Mangin on 11 June near Mary-Courcelles to hold the attack, which started near Montdidier in the night from 9 to 10 June.

The order of the day of the German Seventh Army on 9 July 1918 states that the presence of the French Tenth Army had been revealed to the Germans by mentioning a French radio officer by name. This army betrayed itself by the stereotyped formulation of the daily reports of the weather station Trilport. The German daily report also remarks that at the end of the week the station call signs of the American Third Division had been heard in the area east of Chateau-Thierry.

The French intercept service scored its greatest triumph in July of this year before the beginning of the German attack on both sides of Reims. From intercepted German telephone conversations and ground telegraph traffic, as well as from several intercepted radiograms, the French had recognized the area and the time of the attack. They did the only thing possible under the circumstances - they evacuated the front positions and received the German thrust in their rear positions. Twenty-four hours after the attack began, the German supreme command had to issue its order to stop the offensive. Likewise, the attack of Foch from the forest of Villers-Cotterets on 18 July against the right flank of the German bulge was supported for the most part by the intelligence gleaned by the French intercept service, mainly from intercepted ground telegraph traffic. The same

held true for the attack by Foch between the Somme and Scarpe in the direction of Cambrai on 21 August, and again in connection with the American attack shortly thereafter on the Lorraine front near St. Mihiel.

In all these cases interception of German ground telegraph traffic had given the Allies extensive insight into:

1. the structure of the German front,
2. strength, or losses, and weakness of the German units,
3. difficulties with supply of artillery ammunition, and with respect to the quality of the badly used up German guns,
4. morale of the troops, conditioned by the difficult supply situation, by the war weariness of units brought from the east, and by the impression on morale made by the tanks now appearing in large numbers on the Allied side.

On the German side, the above-mentioned attacks by the enemy had been recognized in time by intercepting telephone and ground telegraph traffic; however, there were no forces left which could be opposed to the superior forces of the enemy.

The French direction finding service had been greatly developed during 1917 and during the first half of 1918. A large number of mobile direction finding stations had been assigned to the armies, and these patrolled the entire front. These stations proved their worth admirably in July 1918; without having to decipher a single German radiogram, the German intention to retreat beyond the Vesle, then the Aisne, then the Ailette was recognized clearly from day to day by comparing the French direction fixes. The fact that the German

station call signs were changed daily, sometimes several times a day, did not disguise this. The German radio stations were working so industriously that the French were able to recognize the identity of the stations from the abundance of direction finding fixes whenever there was a change of call sign. The long moves of the weather stations in the rear areas held by the Germans gave the French valuable clues as to the German intentions.

Shortly after the end of the war it was asserted on the German side that the German army in the west had returned unbeaten from the war and that only the "dagger thrust from the homeland" (the Revolution of November 1918) had brought about the catastrophe. While maintaining complete objectivity, I must observe that there can be no mention of such a thing. I had opportunity to compare the results of the German intercept service and those of the Allies for the year 1918, to weigh them against one another, and to compare the military measures which were then carried out. The intercepted messages gave a reliable picture of the situation on both sides; they showed the degree of readiness for battle and the morale on both sides. Without wishing to detract in the least from the value of the German soldier, it must be stated factually but emphatically that, from May 1918 on, the German front was in an utterly hopeless situation. The assumption that the Germans might perhaps have succeeded in gaining more favorable conditions

for an armistice by retreating step by step and fighting all the way is quite erroneous. Had this been done, then a complete collapse would doubtless have come in the spring of 1919 at the latest, and it would have resulted in the complete annihilation of the German army in the west. Any attempt to gainsay this neglects the facts, and these facts were nowhere reflected more clearly than in the results of the intercept service. The German soldier fought bravely; more than that - he tried with heroic self-sacrifice to resist just as far as possible in spite of undernourishment and hopeless inferiority in materiel. But there is such a thing as the impossible.

THE SECOND HALF OF THE WAR IN THE EAST

(LATE 1915--1918)

From September 1915 to the end of May 1916 virtually nothing occurred in the east, operationally speaking. Then in June 1916 on the Austro-Hungarian front the famous Brusilov offensive broke loose, just at the moment when the Austrians had committed all their available forces on the Italian front. This offensive was not quite unexpected by the Austrians, for the Austrian radio intercept service along with the Arendt service had picked up many indications of an impending large scale operation. In particular, there was a Russian telegram sent on 3 June which betrayed to the Austrians the impending large scale attack. But in downright, frivolous underestimation of the fighting strength of the Russians, the Austrians had taken the matter lightly and made almost no preparations to ward off the attack. Thus Brusilov was able to penetrate deep in the region of Lutsk and particularly in the Bukovina before reinforcements from other sectors brought the wavering front to a stand.

The Austrian intelligence service had not at that time recognized fully the value of the Arendt service, and had not organized the exploitation of the intercepted conversations, as it should have done. Moreover, the Austrian army command had turned its entire attention to the Italian front, and, despite the warnings of the commanders in the east, had not been able to make up its mind to send reinforcements to the threatened front. In the central sector of the eastern

front, which was held by German troops, the Russian attack had no success, for here the people had known how to make better and prompt use of the results of the intercept service. At that time all Russian arrangements from army down to company orders had been intercepted long before the beginning of the offensive. The attacks met with a well-organized resistance.

Even at the end of 1915 the Russians were still supplying plenty of material for the opposing intercept service. Only slowly did recognition of the danger lurking in the careless use of technical means of communication begin to spread among them. Late in 1915 one station of the Russian Fourth Army was ordered to monitor the work of its own stations. This was the first recorded attempt to increase the security factor by monitoring their own radio discipline; at that time, however, it was already too late.

In the spring of 1916 the Russians attempted a radio deception on the Austrian front, and this caused much amusement in the Austrian intercept service. To veil the withdrawal of two corps, they had several radio stations carry on deceptive traffic. Ronge reports that the Russians, innocent as children, announced this in advance in a radiogram which was solved, naturally, by the Austrians. Moreover, they prefixed to every fake telegram an enciphered sentence with the following content: "Do not be alarmed; this is just deception" This intermezzo was comforting to the Austrians, inasmuch as it showed that the Russians had no idea that their

enciphered messages were being deciphered currently by the enemy.

The Brusilov offensive was the last attempt by Czarist Russia³ to turn the fortunes of war in its own favor. With it's expiration in September 1916 and with the outcome of the following campaign in Romania, the war spirit in Russia had disappeared. Intercepted Russian telephone conversations revealed a rapid decline in fighting morale and a clear rise of revolutionary tendency. Over the telephone men scolded openly about their officers and talked about the senselessness of prolonging the war. The thoughts of the Russian soldier turned more and more toward home rather than to the front and to the enemy. Even among the officer corps trends could be recognized which aimed at ending the war, since a military victory was no longer considered possible. Supply was inadequate; the ammunition situation was bad. Social tensions began to occupy more and more space in all conversations.

In March 1917 the revolution broke out in Petersburg. Czar Nicholas II abdicated in the night of 15 - 16 March. The middle class Democrats and the moderate Socialists under Kerenski¹ took power. In spite of the war weariness of the soldiers, they determined to continue the war. Monitoring of Russian internal traffic showed that a new wave of energy from above poured out over the country and the army. There was an attempt under national democratic watchwords to reenliven the military fighting spirit at the front.

Very soon the intercept service learned that the Russian front was stabilizing itself anew, and was preparing for offensive battles.

While the Germans were engaged in violent defensive battles in Flanders, and the Austrians stood at the Isonzo, the Russians under Brusilov, who had meanwhile become commander-in-chief of the entire Russian Army, attacked on 1 July 1917. The impending attack had long since been recognized by the German and Austrian intercept service. They had had ample time to prepare for it. The men at the instruments sat tense and listened to every conversation which referred to the attack and its execution. From Riga to Smorgon the storm broke before the German lines. Only in Galicia did the Russians have partial success. But in the counterthrust German and Austrian troops broke through the Russian lines near Tarnopol, and caused the entire Russian front to waver. All of East Galicia and Bukovina, which had been lost the year before, were again occupied.

To complete the military collapse of Russia, on the left flank the German Eighth Army attacked and took Riga on 3 September. The islands Oesel, Moon, and Dagoe were occupied in October.

Meanwhile, the intercept service had learned of the complete break-down in morale of the Russian front. The former war weariness of the Russian soldiers had made way for definite hostility toward war. The tension between men and officers changed into open conflict. The social factor came into the foreground, sharp and clear. All conversations turned on the ending of the war and the readjustment of social problems. They talked only about capitalists and bourgeois as parties interested in the war; it was clearly to be felt that the war on the

eastern front was virtually at an end. On 7 November the second revolution broke out in Petersburg. Kerenski was overthrown. The Bolsheviks took over the government. Now propaganda radio-grams and instructions from the new government went out all over the country by the dozen, they were heard by the German and Austrian intercept services as well. The major activity of these services was now turned from monitoring Russian military radio traffic to listening to Russian internal traffic. It was a question of gaining clarity regarding events in Russia. The military intercept service in the east had completed its assignment; now the political assignment stepped into the foreground.

After the end of World War I, General Hoffmann, in his book "The War of Missed Opportunities," stated with regard to the intercept service that during the entire war in the east this service had supplied the German command currently with such complete information regarding the enemy that it was always fully informed regarding the situation on the enemy side.

From Tannenberg to the end of the war the interception of Russian technical means of communications had given the German and Austrian command so many suggestions for the execution of their own measures that it is impossible to conceive how the war in the east might have gone, if this means of intelligence had not been employed by the Central Powers, and if the Russians had not used their technical means of communications in such a careless manner.

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THE ZIMMERMANN TELEGRAMS

In the course of World War I the intercept service on both sides scored various successes which made it possible to win battles, to plan and carry out operations, or to help shape entire campaigns to a very great degree. However important these individual successes were and however greatly they influenced the course of military events, they were nevertheless not able to produce results which would decide the war. Only in one case did this happen, and this case will now be described briefly.

It was in August 1914, a few days after the occupation of Brussels by the German troops, when a German officer appeared in an aristocratic villa in the suburbs of Brussels, presented a billet slip and took up his quarters there. The villa belonged to the family Czek. On the following day the son of the house, Alexander Czek, an engineer by calling, announced himself to the German officer and asked for a brief interview. It was granted willingly, and now Alexander Czek related that he had set up in his house a short time before a radio sending and receiving set which was not being used by him at the moment but was ready for operation. He desired to bring this fact to the attention of the German military authorities so that he would not come under suspicion of carrying on espionage with the aid of this radio set. He led the German officer into the room in question and showed him the apparatus. The officer now gave instructions to leave the

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set standing untouched and said he would immediately report to the competent German signal officer, who would then take proper action.

On the following day there appeared at the home of Alexander Czek a German lieutenant colonel, the signal officer of the German command in Brussels, who had the set demonstrated. He recognized at once that Czek had constructed an apparatus which was brand new in the field of radiotelegraphy, since it made possible working on an extraordinarily wide wave-band without having to undertake complicated switchings or other changes. Such an apparatus was exceedingly important for handling reception, especially for the intercept service which still had to count on the enemy's using waves for which one was not equipped. Czek's apparatus was dismounted and taken to headquarters. With that the matter was settled for the time being.

Some weeks later technical trouble developed in the transmitting apparatus of the heavy German radio station in Brussels, which could not be eliminated with the means at hand. By chance, someone remembered the engineer Alexander Czek and had him summoned. Czek succeeded in eliminating the trouble in a short time and in getting the station ready for operation.

The radio station of the Brussels general command had three assignments at the time: first, it had to work the army traffic of the higher German military authorities; next, it was in direct communication with Neuen and Königswusterhausen for handling diplomatic

radio traffic between the Foreign Office in Berlin and the "Military Administration Belgium"; the third task consisted in copying during free periods foreign radio traffic, i.e., in carrying on intercept work.

The technical qualifications of the engineer Alexander Czek had now attracted the attention of the Germans, and it was decided to make use of his services. Especially since, as it turned out, Czek was not a Belgian but an Austrian. His father had held a high position in Austria and belonged for a time to the intimate circle of Emperor Franz Joseph. Alexander Czek's mother was an English woman. The family had resided in Brussels for several years, and Belgium had become their new homeland. Before engaging Czek's services for a long ter , some investigations were made, which all turned out in favor of the Czek family. In Vienna it was stated that there was not the slightest doubt regarding the family in general or about Alexander Czek in particular.

Whereupon, Alexander Czek was requested by the Brussels command to appear, and they now revealed to him that there was a prospect of using his services for some little time; they suggested that he enter the Brussels radio station on the basis of a civilian contract.

Aside from his technical knowledge in the field of radio, Czek had a good knowledge of several languages, and it was this latter circumstance which finally proved the determining factor

in engaging him at the radio station. Czek agreed and, as time went on, proved to be an extremely useful fellow worker. He took care of all the apparatus, made suggestions for improvements, and on every occasion rendered good service with his linguistic knowledge. They came to trust him absolutely and one day revealed to him that they intended to use him in the radio receiving service.

Czek knew the Morse alphabet and could copy at what was then the usual speed. He was given additional training in ear reception, and was then employed in copying the transmissions of foreign stations sent in plain text. They had had Czek sign a pledge of secrecy; had admonished him to maintain absolute silence; and with that, all the formalities were at an end.

In his new field Czek worked to everybody's satisfaction. Evidently they had made a good find at the Brussels radio station. After some months had passed, they went a step further and used Czek for their own sending and receiving service, primarily on traffic with Nauern and Königswusterhausen. He had to send or receive the enciphered telegrams.

Alexander Czek was not only a competent technician and linguist, but he also proved to be an agreeable companion and comrade. He spent many an evening in animated conversation with his new comrades and with the officers of the Brussels command and was everywhere a welcome guest. The general confidence in him was unbounded. One day when there was peak operation at the radio station, several very long enciphered telegrams arrived from the Foreign Office at Berlin.

It also happened that two people at the station were sick. The heads made up their minds quickly and handed Czek the two code books by the aid of which the cryptographic system used by the Foreign Office was deciphered, gave him the necessary instructions for using the two codes, and Czek set to work.

The cryptographic system used by the Foreign Office in communication with representatives abroad (including the administration of the "General-Gouvernement Belgien") consisted of a code and an encipherment. The code, or "Schluesselbuch" as it was called at that time, was a thick volume in which the code elements and their meanings in plain text were entered in alphabetic sequence. A decipherment by the aid of this key book was quite simple; one only had to look up the code groups in their alphabetic sequence and read off the meaning. To make the system more resistant to unauthorized decipherment, they had provided an encipherment by the aid of which the secret text derived by changing the plain text into code groups was changed again, i.e., was reenciphered. This encipherment book was a relatively small volume, and when deciphering a telegram it was necessary to work with this little book first, i.e., to find the basic key by removing the encipherment. This procedure was relatively simple, but called for a certain skill, since radiograms sometimes arrived in garbled condition and the solution of the groups was not always obvious. Therefore, it was necessary to master the Morse alphabet and to know the

possible errors and guesses in order to reach a solution of garbled messages without having to send back long inquiries.

Czek turned out to be an extremely clever decoder, and from then on he was used repeatedly for decoding messages arriving from Berlin. By being introduced into the intercept service, into the entire sending and receiving activity of the station, into the work of decoding, and into questions of technology, Czek had arrived at a confidential position of the first rank. He filled it conscientiously, and gave no occasion for any complaints whatsoever.

In the summer of 1915 a captain of the English Intelligence Service turned up in Brussels who had learned that there was a man employed at the Brussels radio station who had been residing in Brussels. He thought this might be a chance to get some insight into the operation of the station, and began to spin a web around Czek, so to speak. A young lady of Brussels was selected to win Czek over to work for the British secret service. This was not exactly easy because Czek had endeavored thus far to be correct in every way. Gradually the young lady brought Alexander Czek into contact with members of the Belgian liberation movement, and after months of work finally succeeded in convincing him that it was his duty to work not for the Germans but for the Allies. They reminded him of his mother's nationality, of his new homeland, of the German attack on Belgium, of the German striving for

power, of the just cause of the Allies, and brought it about that Czek said he was ready to prepare a copy of the code of the Berlin Foreign Office for the British secret service.

This was the goal of the entire activity of the British secret service, as far as Czek was concerned.

This task was not exactly easy since the two code books were not in Czek's custody but were only handed over to him from time to time when he had to decode an incoming telegram. And this was by no means the rule. Normally, decoding was done by the German personnel of the station; Czek was only brought in to help out. Moreover, there was usually a second person in the room so that it did not seem feasible to copy the book systematically. Consequently, Czek chose another way. When decoding incoming telegrams, he noted the groups occurring in the telegram along with their meaning on a sheet of paper, as a draft for his fair copy so to speak, and then copied the text neatly. The pencilled notes on the draft he did not destroy but concealed on his person. In this way he succeeded over some months in noting the meaning of all the code groups contained in telegrams received during this period. And after all, those were the syllables, words, or phrases which were most frequently used.

Czek went about his work so cleverly that never once did suspicion fall on him. It was in a different way that he aroused the mistrust of the German military authorities. He had been

seen a few times in public places in the company of members of the Belgian liberation movement. People watched him and found that he went around with a young lady concerning whom it was known that she was in contact with the British secret service. Thereupon, Czok was dismissed from the service of the Brussels military command, and was ordered to remain in Brussels and not to leave that city.

Now Czok saw danger arising for himself and for his work, and he decided to flee. He left Brussels, taking along his sketches, and reached the Dutch border. Along this border the Germans had stretched a great wire barricade charged with electricity. Czok knew this. With two boards which he wrapped with inflated bicycle tubes, he succeeded in producing two insulated plates by the aid of which he crawled under the electric fence and reached Dutch territory. Shortly afterwards Czok's sketches were in the British Cipher Bureau in London. From then on they were able to decipher and read all radiograms which were exchanged between the Berlin Foreign Office and the German representatives abroad. This was the case from about the end of 1915 on.

Even though this stroke by the British Intelligence Service deserved great recognition, it is simply marvelous that the English succeeded in keeping secret throughout the entire war the fact that they knew the cryptographic system. Not the slightest shadow of suspicion was aroused by any lack of caution. Every German telegram enciphered by this system was laid before the British Foreign Minister personally, who made his decisions accordingly.

What made the Alexander Czek case a matter of the utmost importance will now be revealed,

The Secretary of State for Foreign Affairs in Berlin at that time was Zimmermann. Late in 1916 and early in 1917 the role of the United States as purveyor of war material for the Allies had assumed such importance that it almost equaled a state of belligerency. Again and again, voices had been raised in the United States to the effect that the United States must enter the war in order to shorten its duration. On the German side, an intensive counter-propaganda had been carried on, and gradually there had developed a war party and a peace party. As seen from Germany, the possibility of the entrance of the United States into the war loomed threateningly on the political horizon. Then in the Foreign Office they decided on a political intrigue which was intended to afford a counterpoise for this danger. Zimmermann decided to play Mexico against the USA.

At that time the President of Mexico was Carranza, who had attained the presidency by the aid of the United States but, nevertheless, had taken a position distinctly friendly toward Germany. About the middle of 1917, Zimmermann had recourse to the German ambassador in Mexico, von Eckhardt, in a rather long telegram.

This telegram was so important for Zimmermann that he was very anxious to have it reach the German ambassador, von Eckhardt, safely under any circumstances. Accordingly, several routes were

chosen for transmission. The first led via radiotelegraphy from Nauen to Sayville on Long Island for forwarding to the German Ambassador von Eckhardt in Mexico.

The government of the USA had, to be sure, since the beginning of the war forbidden the use of this wireless link for the transmission of messages dealing with the war, and had kept an eye on the radio traffic. Nevertheless, the radiogram was sent and delivered to Count Bernstorff, the German ambassador in Washington, who forwarded the contents to von Eckhardt.

The second route was via Sweden, by wireless from Stockholm to Buenos Aires, from there to Washington, and from there again to Mexico.

The third route was not without its humorous side. It had been planned to send the telegram in the form of a letter on the large German submarine "Deutschland," whose captain, König, was considered at that time one of the best submarine commanders. The departure of the submarine, which was originally fixed for 15 January, was delayed and they withdrew the letter in order to append its contents to a telegram which was being sent by the then American ambassador in Berlin to his government in Washington. How this route came to be chosen was as follows:

The German Foreign Office applied to the ambassador of the USA in Berlin, Gerard, with a request to transmit a telegram of the Foreign Office to Ambassador von Bernstorff. Since it was

customary to show the text of the telegram in plain language in such cases, the Foreign Office showed Ambassador Gerard a telegram numbered 157 which was directed to von Bernstorff and which referred to the peace action of President Wilson. Gerard approved of sending the telegram. In reality, however, the Foreign Office had appended to the enciphered text of the telegram 157 another telegram, namely, the one previously mentioned and intended for Ambassador von Eckhardt. The grotesque feature was that Zimmermann was using the American ambassador, Gerard, and the American Secretary of State to transmit a telegram whose content concerned a hostile action against the USA.

At the Berlin Foreign Office they felt at that time that they had been very sly, and they were proud of having so neatly "taken in" the ambassador of the USA. But it is an old story that, precisely when one is trying to be especially sly, one is already about to commit something especially stupid. In this case the stupidity was enormous, for it was known to the Foreign Office that this telegram had to take the following route: from Berlin by wire to Copenhagen, from there by cable to London, and from London by cable to New York.

After the outbreak of war, England had generously declared itself ready to forward enciphered telegrams of neutral diplomats which contained messages of the German Government to its diplomatic representatives abroad. It never occurred to anyone in

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Berlin that this generosity was prompted by the idea of being able in this way to control all German telegrams in both directions.

The humorous part, in this instance, lay in a different direction. On 16 January the British Intercept service had intercepted the Nauen telegram to Sayville; however, the reception was so bad that the message could only be copied in badly garbled form. When they had deciphered the enciphered text in London, they finally got the following:

To the Imperial German Ambassador in Washington.

Count Bernstorff,

For the Imperial German Ambassador in Mexico, von Eckhardt.

Strictly secret, intended only for the personal information of Your Excellency and to be forwarded to the Imperial Ambassador in Mexico, by means of ... by a secure route.

We are planning to start unrestricted submarine warfare beginning 1 February. Nevertheless, we are very anxious to keep the United States neutral... . If that is not successful, we propose to Mexico an alliance on the following basis: ...warfare....conclusion of peace. Your Excellency will, for the time being, inform the President...war with USA...President..., that our submarines will force England to make peace within a few months. Confirmation requested.

Zimmermann

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This dispatch showed that a diplomatic action of the first rank by Germany was involved. The "Secret Service" was immediately told to purchase in Mexico City from the telegraph bureau a copy of the telegram forwarded by von Bernstorff to von Eckhardt. However, before this happened, the telegram sent by Gerard to Washington arrived in Room Number 40 of the British Admiralty, and this supplied the British cryptanalytic service with a complete text of that telegram of Zimmermann to von Eckhardt.

On the evening of 23 February 1917, the ambassador of the USA in London, Mr. Page, received a telephone call from the British Foreign Minister, Mr. Balfour, who requested him to call at the Foreign Office that same day. Page betook himself at once to Downing Street. After the gentlemen had greeted one another, Balfour without a word handed the ambassador of the USA a sheet of paper whose typewritten text Page read with growing interest.

In the following night the following very urgent cablegram went from London to Washington:

24 February 1917

To the President,

Office of the Secretary of State, Washington.

In about three hours I shall dispatch to the President and Secretary of State a telegram of the greatest importance.

Page.

At the expiration of the announced three hours the London overseas cable station received the following ciphered telegram for urgent dispatch:

24 February 1917

To the President,

Office of the Secretary of State, Washington.

Secret. For the President and the Office of the Secretary of State.

Balfour has given me the text of an enciphered telegram from Zimmermann to the German ambassador in Mexico. A copy can probably be secured through the telegraph office in Washington. The first group indicates the telegram number; the second the code which was used; the third is Zimmermann's personal identification group. I am sending by post a copy of the enciphered message and the deciphered German text. Meanwhile the English translation follows:

"We are planning to open unrestricted submarine warfare on 1 February. Nevertheless, we are endeavoring to keep the United States neutral. Should this not succeed, we shall make Mexico a proposition for an alliance on the following basis: common conduct of the war, common conclusion of peace, extensive financial aid, and an undertaking on our part that Mexico is to recover the lost areas of Texas, New Mexico, and Arizona. Details are left to you. Will you

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most secretly inform the President of this when the entrance of the United States into the war had become certain, and suggest at the same time that he on his own initiative call upon Japan to join us, and that he mediate between Japan and ourselves. At the same time, call the President's attention to the fact that we are waging unrestricted submarine warfare, and in that way shall force England to make peace in a few months.

Zimmermann"

I hasten to send this message so that all necessary measures may be taken to guard our territory against invasion.

Strictly secret! -- At the beginning of the war the British Government came into the possession of a code. It served for decipherment of the above telegram. The Government obtained copies of von Bernstorff's telegrams which went to Mexico. They were sent to London and deciphered there. This system has hitherto been a strictly guarded secret regarding which the British Government informed me only in view of the unusual circumstances and of its friendly feelings for the United States. The British Government requests maintenance of strictest secrecy, but has no objection to the publication of this Zimmermann telegram.

Copies of this and other telegrams were not secured in Washington, but were purchased in Mexico.

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I have thanked Balfour.

The Japanese have not as yet been informed, but it is probable that they will discuss the matter publicly when they have knowledge of it, in order to clarify their position and to prove their fidelity to the Allies.

Page

The way in which the British came into possession of this message is described in the words: "The telegram was purchased in Mexico." However, the English secret service actually got this precious message in the following ways:

1. by intercepting the radiogram from Nauen to Sayville;
2. by intercepting the radiogram from Stockholm to Buenos Aires;
3. by reading the cablegram from Berlin via Copenhagen to London and Washington;
4. by purchasing from a Mexican telegraph official the Morse tape, preserved in the telegraph office in Mexico, of the telegram from von Bernstorff to von Eckhardt.

The purchase in Mexico did not take place, to be sure, until a knowledge of the content had been obtained in the first three ways mentioned; it merely served for confirmation.

One can imagine what impression the knowledge of this dispatch made in Washington on the President and on Secretary of State Lansing.

Although the content of the Zimmermann telegram was conditional and only applied in case the United States declared war on Germany, nevertheless this German step aroused great indignation in Washington. The support - even though conditional - of Mexico's claim to the three southern states which it had lost to the United States in the war of 1846, was regarded as an attack on the territorial status of the United States. They overlooked the basic idea of the dispatch which was to the effect that Germany was trying to maintain the neutrality of the United States, and only regarded the contingent consequence which would be released by America's entrance into the war.

In spite of all their indignation, people in Washington were mistrustful of London. Suppose the entire Zimmermann telegram were only a fake to maneuver the United States into the war? They wanted proof, and telegraphed to the ambassador in London that he should ask the British Government to turn over a copy of the German secret code.

The British Government declined from basic considerations of security, but declared that it was ready to have the Zimmermann telegram decoded once more using the code present in London, and to have this done in the presence of a member of the American embassy in London. This was an easy matter, since Mr. Bell, the Secretary of the American embassy and representative of the signal service, lived quite near the British central intelligence office.

The enciphered Zimmermann telegram was given to Bell; the British loaned him their precious German code, and Bell was now able to perform the decoding within a few hours. Wilson was now in a position to determine that the message was absolutely authentic. However, the President insisted on receiving the German original text. In answer to this Page telegraphed:

London 2 March 1917

To the Secretary of State in Washington

The first group signifies the number of the telegram 130.

The second indicates the code to be used in deciphering.

From group three on, the groups read:

Auswärtiges Amt, Januar 16.Nr.1. - Ganz geheim.

Selbst zu entziffern. - Wir beabsichtigen -

Meanwhile, the second Zimmermann telegram had been deciphered in London and Page got a copy:

To the Imperial German Ambassador in Mexico, von Eckhardt

8 February 1917

Strictly secret. To be deciphered personally.

Under the assumption that the USA would find out nothing about it, you are requested to present again to the President the proposal for an alliance. Any final decision, however, is dependent upon the entry of the United States into the war. The President may enter into negotiations with Japan on his

own initiative. If the President should fear retaliation, you are authorized to offer him a permanent alliance after the conclusion of peace, provided he succeeds in drawing Japan into the alliance.

Zimmermann

In London they declared they were ready to have decipherment of telegrams of the German Foreign Office carried out jointly with a member of the embassy of the USA in order to give guarantee of the genuineness of the material. They were also ready to have messages sent to Berlin by German representatives abroad deciphered in his presence. In Washington they agreed to this.

In Berlin, meanwhile, people entertained the firm conviction that the ciphers of other nations might be capable of solution but not their own. And the method of transmitting a message of such importance through the ether did not appear to them as a piece of folly.

Through these two telegrams of Zimmermann's, Wilson's position in regard to Germany was now clearly determined; for those states which had not been able to get up any enthusiasm for the war these dispatches afforded proof that an intrigue of the Berlin Foreign Office was willing to hand over to the Mexicans great areas of the USA.

Meanwhile, in Washington they had become convinced that the

first and second Zimmermann telegrams were genuine. They inquired in London whether people there would agree to making the content of the first telegram known. After some hesitation the British Government stated that it would agree on condition that the true source should not be revealed but that the impression should be given that the telegram had been brought to the attention of the United States in some manner in Mexico. Thereupon, Wilson at the White House published the content of the dispatch on 1 March.

A storm of indignation passed through the Congress and the entire country. The war party got an enormous lift.

The publication in Washington of the Zimmermann dispatch became known at once in Berlin. There was an excited session of the Reichstag. Zimmermann was forced to admit that the dispatch was genuine.

On the following day in the "Vossische Zeitung," Georg Bernhard criticized the frivolousness of the German Government, and declared: "We cannot comprehend how a message of such importance can come to the knowledge of a foreign country. We cannot conceive that such a message would be given to a courier for transmission, even though he were the best and most reliable in the world."

Georg Bernhard was absolutely right; no courier played a role in this case, and in England they saw right.

On the very day on which Wilson was publishing the text of the Zimmermann telegram in Washington, von Bernhard was telegraphing

the results of the negotiations. According to him, Corranza had shown himself "not adverse to such plans"; he would "consider benevolently," and he had "talked for an hour and a half" with the Japanese ambassador in Mexico.

But on the very same day von Eckhardt learned of events in Washington, and on the next day he telegraphed:

To the Secretary of State of the Foreign Office 2 March 1917, in Berlin.

The local paper "Universal," which is friendly to the Allies, publishes today the same report that was contained in yesterday's Washington Telegram - and which apparently has been in the hands of President Wilson since the breaking of relations - namely, the wording of cablegram A Nr. 1. Naturally, this was not revealed by me here. Treachery or indiscretion must have occurred in the United States or cipher I 3040 has been betrayed.

The wording of cable Nr. 2, which reached me in the other familiar fashion, has not been published as yet. I have denied everything here.

v. Eckhardt

In Berlin the uneasiness grows. They seek the source of the betrayal. The following exchange of telegrams ensues:

To v. Eckhardt

7 March 1917

Please burn all compromising instructions. Have publicly

recognized the cable. Please see to spreading the word that the alliance was only intended in case of America's entrance into the war.

Zimmermann

To v. Eckhardt

21 March 1917

Strictly secret.

Decipher personally.

Please cable in the same code used for deciphering cables 1 and 2 how the originals and keys were safeguarded, and especially whether the two cables were kept in the same place.

Stumm. - Berlin.

To v. Eckhardt

Various thing indicate that the treachery took place in Mexico. The utmost caution is in order. Burn all compromising documents.

Zimmermann

To Zimmermann

27 March 1917

Both cables were deciphered by Magnus according to my special instructions. Both telegrams, as always where political documents of secret character are involved, did not come to the knowledge of embassy personnel. Telegram Nr. 1 K 4 arrived in the cipher system I 3040, while Kinkel (a former employee of the German embassy in Washington), who is now

employed here, thinks he recalls that the Washington embassy sent it, like all other enciphered telegrams sent here, from Cape Cod (a cable station). In both cases the originals were burned by Magnus and the ashes were scattered. Both cablegrams were preserved in an absolutely secure safe, which was bought solely for this purpose and was located in Magnus' bedroom, down to the time that they were burned.

Answer to telegram Nr. 21. Instructions were carried out. Cable number 18 has not arrived as yet.

v. Eckhardt

In a further telegram of 30 March 1917, von Eckhardt asserts again that any indiscretion in Mexico was not possible and recounts again all security measures, the reading of the telegrams in a low voice at night, the security of the safe, etc.; but at the same time he calls attention to the less cautious procedures at the German embassy in Washington, where even secret telegrams had been known to the entire chancellery and where two carbons had always been made for the registry office, something which was never done in Mexico. Finally, he insists upon a judicial investigation by Consul Grunow.

In Berlin they allowed themselves to be convinced of von Eckhardt's innocence by this telegram, and confirmed this to him by radiogram of 4 April 1917 in which it says: "No blame attaches

to you or Magnus."

Meanwhile, negotiations with Carranza in Mexico continued because the deliveries of ammunition stood in the forefront.

To v. Eckhardt, Mexico

17 March 1917

Find out what ammunition and weapons are desired and what Mexican harbor on the east or west coast a German ship would enter under a foreign flag. As far as possible, Mexico must procure arms from Japan and South America.

Zimmermann.

The Berlin Foreign Office, however, did not build all its hopes on Carranza alone. They even went so far as to draw his political opponents and antagonists into the circle of intrigue. Thus, on 24 March 1917 the German military attache in Mexico radios to Berlin:

The Vice-Consul in Mazatlan reports that Villa, who is being supported by the Germans, is expecting three shiploads of ammunition to be landed between Mazatlan and Manzanillo. It is thought that Cantu is also in the alliance. (Cantu was a Mexican revolutionary leader whose field of activity was southern California.)

These telegrams were deciphered in London, and the content disclosed in a small intimate circle. The German search for the source of the compromise occasioned great merriment.

In this connection, it must be emphasized that the British intercept service was able during the entire war to keep its work so secret that not the slightest hint regarding it reached the outside. The British secret service, to which the intercept service belonged, even went so far in camouflaging its work that it allowed articles to appear in the British press criticizing its own work and making violent attacks on it. In these articles, which were written by the service itself, the work of the British secret service was characterized as totally antiquated, and it was asserted that one failure followed the other. The affair of the Zimmermann dispatch was made the occasion for special criticism; it was said that the American intelligence service was much more thorough and precise and it was a shame that the Zimmermann affair had been discovered in Washington and not in London. By this constant self-ridicule they fooled the German intelligence service and German public opinion so thoroughly that these articles in the English press were seized upon with great delight, were reprinted, and provided with appropriate commentaries.

Far more serious, however, was the effect of the Zimmermann telegrams in the United States. Between mid-January and the end of April 1917 some 60 telegrams were exchanged between Zimmermann and von Eckhardt. All came to the knowledge of Wilson. Their impression of a plot between Germany and Mexico. They tipped the scales in the foreign policy of the United States. On 6 April

1917 the USA declared war on Germany.

However, the exchange of telegrams between Berlin and Mexico continued:

Zimmermann, Berlin

To v. Eckhardt, Mexico

13 April 1917

Please answer telegram number 10 stating the sums which will be required to support our policy. Preparations for the shipment of considerable amounts (aid, eventually weapons, too) are being made here.

v. Eckhardt, Mexico

To Zimmermann, Berlin

13 April 1917

For Nadolny and the Grand General Staff.

Mexico 12 April.

Where is Lieutenant Wohst? Did he send approximately 25,000 dollars to Hilken? He or someone else must send me money for 55793 quarterly payments for Hermann. An explanation:

Hermann, a handsome, blonde German with an English accent, claims to have received from the general staff a year ago the mission to destroy the Tampico oil field by fire; this order was repeated supposedly by Hilken in January; he now proposes to carry it out, and asks me whether he is to do so. Would it not be well to answer him that I am not in touch with Berlin? Verdy thinks that he and his companion B 51158 Gerds are

English or American spies.

Request an immediate answer.

v. Eckhardt, Mexico

To Zimmermann, Berlin

14 April 1917

The President declares he intends to remain neutral under all circumstances. If Mexico nevertheless becomes involved in the war, we must wait and see. In his opinion the alliance has become a ridiculous matter due to the premature publication of the telegram but may later turn out to be necessary. As for the deliveries of ammunition - 7 mm Mauser rifles - and money, he will give an answer when he has the power of decision in his own hands after getting powers plenipotentiary from the Congress. The Congress is dominated by the pro-German military party.

v. Eckhardt, Mexico

To Zimmermann, Berlin

17 April 1917

Mexico, 16 April.

Yesterday I attended the opening of the Congress. The President expressed his strict neutrality. Both coming and going I received great applause. "Long live Germany! Long live the Kaiser!" On entering the hall the entire chamber manifested its good will. The American ambassador was whistled at feebly three times.

The German public learned nothing of all these events, and in the Foreign Office at Berlin no one had any idea that the entire telegraphic correspondence between Berlin and the German representatives abroad was being read in England, insofar as it could be picked up there. In Berlin they strove for the utmost secrecy, and yet, for all practical purposes, it seemed as if the most secret matters stood in the public press. Down to the end of the war the English were able to follow precisely all dispositions of the Berlin Foreign Office and of the German Imperial Government. The chief of the British secret service during the war, Admiral William Reginald Hall, declared in 1920, in a very interesting speech at Manchester, that the decipherment of the Zimmermann telegrams had decided the World War in favor of the Allies. It would be impossible to estimate highly enough the significance of this deed.

But what became of Alexander Czek? - When World War I had come to an end, his father tried to follow the trail of his son. He inquired in Holland and after much difficulty discovered the last traces in Rotterdam. From there on nothing could be discovered.

Since he knew that his son had worked for the British secret service, he applied to the chief of that service after the end of the war, and requested news of his son's whereabouts. He received this information: "I have received your letter and must inform you that this is the first time I have ever met the name Alex Czek.

I am sorry to have to inform you that I cannot tell you anything whatsoever regarding your son and his fate."

Alexander Czek had disappeared.

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THE INTERCEPT SERVICE AT SEA

The war at sea 1914--1918 (aside from submarine warfare) did not play the role that one had initially been led to expect. Germany's principal opponent at sea was Great Britain. On the question whether the German fleet should seek a decisive battle with the English Battle Fleet, the German Imperial Government differed with the Admiralty Staff and with the Secretary of the Imperial Navy, Grand Admiral von Tirpitz. While these last two wished to commit the fleet, above all to interrupt English-French communications across the channel, the Imperial Government considered it correct to guard the fleet against severe losses so as to have it as an instrument of power at the time of the peace negotiations.

Within the framework of the intercept service, however, the interception of enemy radio traffic occupied no less a place at sea than with the land forces. In fact, we may say that the battle in the ether at sea was much more intensive than on land. Primarily it was England and Germany which paid most attention to the naval intercept service and repeatedly knew how to derive advantage from this invisible weapon.

The principle of disguising radio traffic was here pushed into the foreground far more than ashore. From the very beginning, the use of cryptographic systems was on a larger scale.

Moreover, the system of so-called fake radio traffic was very good; here a message from a naval command station to a ship at sea was apparently dispatched by radio to some other coastal station, while the warship stood by for reception on the same wave length and heard it at the same time.

Soon after the outbreak of the war, the German fleet suffered a mishap which later turned out to be very disadvantageous for the German naval forces. In the Baltic the German fleet opened the naval war with an attack by the small cruisers "Augsburg" and "Magdeburg" on Libau on 2 August 1914. A few months later the cruiser "Magdeburg" was sunk by Russian naval forces in the Baltic. That did not remain a secret. However, it did remain a secret that the Russians sent down a diver to the sunken "Magdeburg" who brought up from the radio booth the code book with its heavy lead covers. The book was dried carefully and turned out to be utterly undamaged. Monitoring of German naval traffic by the Russian naval intercept station at Kronstadt revealed that the Germans were still working with this secret system. Now there began a lively deciphering activity at the Russian cipher bureau in Petersburg which yielded excellent information regarding all events in the German high seas fleet. The English got a copy of the code, and henceforth were likewise in a position to decipher German naval radio traffic, -- and that for a period of years!

One of the first successes of the British fleet, which

was based on results of the intercept and deciphering service, was the battle at the Doggerbank on 24 January 1915. The English had been able to follow exactly the approach of the German light naval forces, and they knew all the German ship units which had been committed for this action. The sinking of the German armored cruiser "Blücher" at that time was due to the English intercept service.

In the course of World War I, the interception of naval radio traffic assumed ever greater proportions; the English in particular achieved very noteworthy results, especially in monitoring the traffic of German submarines with their bases and with other naval units on the high seas.

The London "Times" on 22 December 1927 published a short resume of a lecture delivered by Sir A. Ewing, Professor of the Philosophical Faculty at the University of Edinburgh. This man, an outstanding professor, was, during the period 1914-1918, chief of that bureau of the English Admiralty whose task it was to decipher the intercepted radiograms of the German Navy. This bureau thrived beyond all expectation and had more than 50 regular decoders; on the average 2,000 intercepted messages were handled here daily. All movements of German warships were followed by the British Admiralty, primarily by the aid of information secured in this fashion. As Sir Ewing remarked, thanks to various fortunate accidents, the British information service had nearly all the German

codes in its possession; the remainder were solved by analytic methods.

The carrying out of the long range blockade of the German North Sea coast by the British was possible with only meager forces, because they were promptly informed regarding all movements of German units. Moreover, the British cipher bureau very quickly succeeded in solving the German cipher used in the radio traffic with submarines. This was a success of really inestimable value, since now in connection with the direction finding service the English were in a position to follow the movements of the German submarines precisely from day to day. While in Germany people were anxiously endeavoring to keep everything pertaining to the use of submarines strictly secret, doubling and tripling their guards and security measures in a downright convulsive fear of English spies, the English intelligence service had nothing to do but to follow carefully the German naval radio traffic. In Room Number 40 in the British Admiralty, in which the evaluation center was located, there was busy activity day and night. On an enormous wall chart the ascertained positions of German units were entered. Everything having to do with this was as well known here as if details had been published in an "Extra."

The English were the first in World War I to create a technically exact and fast working system of evaluation, a system which can be regarded as modern even today. The "direction finding"

stations were connected with each other and with the central office by teletype. Every reading taken was passed at once to the central office, and laid out here by the aid of silk threads on a great orientation map which was mounted horizontally. In the cipher bureau sat the men who day and night deciphered every incoming intercepted radiogram. An enormous card file contained all station call signs which had hitherto appeared in the intercept service, along with all other available data, and this made it possible to recognize currently the systems according to which call signs were changed in German traffic, to reconstruct these, and even to tell in advance what call signs this or that German station would have tomorrow or day after tomorrow or a week hence.

The collaboration between direction finding, evaluation, and decipherment was sensible and well-organized, as it never was in Germany either during World War I or after the war, or even during World War II, because here people never got away from petty concern with their own interest and egotistic pride in their own unit.

What significance the English attached even at that time to the intercept service is evident from the mere fact that there was an admiral at the head of the service; in Neumuenster (where the central office of the German naval intercept service was located) it was a naval lieutenant. In London, at the last, several hundred men were engaged in decipherment and evaluation; in

Neumuensler there were a few dozen. And if, in spite of that, successes were scored by the German naval intercept service, then that was due to the intelligence and initiative of individual men. The over-all organization was inadequate.

The greatest success of the young German submarine weapon came soon after the beginning of the war in the sinking of three English armored cruisers by "U-9" under Lieutenant Weddigen. That was before the breaking of the German code for submarines. Later, when in February 1915 submarine warfare was carried on according to plan, it did not bring the expected results, and for the above-mentioned reasons could not possibly do so. After the sinking of the "Lusitania" submarine warfare was also limited by American pressure. And when it was resumed again in an intensified form on 1 February 1917, it only served in conjunction with the Zimmermann dispatches to bring the USA upon the scene as an active opponent.

The forces available at the beginning of the war for cruiser warfare abroad consisted essentially of the East Asiatic Cruiser Squadron under Vice Admiral Count von Spee. Since von Spee could not maintain himself in eastern Asia against the superior forces of the Allies, he put out into the Pacific on 13 August 1914. His squadron consisted of the armored cruisers "Scharnhorst" and "Gneisenau," and the small cruisers "Dresden," "Leipzig," and "Nürnberg."

What happened in the next weeks on the Pacific was an

extremely interesting battle in the ether, which was essentially something brand new. While the English radioed away bravely in their search for von Spee's squadron, with the result that it was always possible for von Spee to keep posted on the movements of the enemy, he himself, was able so to mislead the enemy by radio silence and occasional deceptive radio traffic by the ship's radio of the little cruiser "Emden," which had been ordered into Australian waters, that his appearance in Chilean waters came as a complete surprise. At Coronel on 1 November 1914 von Spee's squadron in complete battle order and battle readiness met the squadron of the utterly unsuspecting Admiral Cradock, who supposed that von Spee was far away in the direction of Australia. Von Spee was able to bring his ships into such a favorable position and to strike so unexpectedly that within a very brief time the British armored cruisers "Good Hope" and "Monmouth" were sunk, and several other units were badly damaged. By this naval victory Allied shipping in adjacent areas was almost completely paralyzed for a number of weeks.

To be sure, the "Emden" itself fell victim, so to speak, to radio traffic a few days after the battle at Coronel. After a fairly long career as a raider in the Indian Ocean, it had appeared off the Cocos Islands to take on water and destroy the radio station there. In so doing, the radio station of the "Emden" engaged in traffic with the land station, which took the "Emden" for an Australian cruiser. During this radio conversation the

operator of the "Emden" did something in an unskillful way so that the land station recognized the true character of the ship and sent out alarm messages; the "Emden" now sent out a landing party to destroy the radio station. While the ship was waiting for the return of this unit, a superior Australian cruiser hurried up in response to the alarm messages from the station, fired on the "Emden" and damaged it so badly that it had to be run on the reef by its own crew.

Count von Spee had a similar misfortune with his squadron on 8 December 1914 when, on his way around South America, he was approaching the Falkland Islands and made contact with the radio station there, without noticing that a strong British squadron was lying protected by the Islands. In this way von Spee gave himself away prematurely, and was attacked unexpectedly without being able to deploy his ships properly.

The greatest sea battle of World War I was the battle of the Skagerrak on 31 May 1916. It, too, was influenced by the intercept service and, to be sure, on both sides. Both the British and the Germans had followed the course of the enemy squadrons; the only difference was that the Germans had succeeded in veiling the course of the German main fleet so that it appeared as a surprise for the English, and by so doing decided the course of the battle.

In many other undertakings at sea during World War I the intercept service played a decisive role. A detailed account of all these cases will be reserved for a later work.

THE ITALO-AUSTRIAN WAR

Down to the beginning of World War I the Austrian intercept service had been directed against Italy. The Austrian cryptanalytic service had succeeded even before the outbreak of the war in solving the cryptographic system used by the Italians in traffic between Rome and the diplomatic representatives abroad, and it was able to read such traffic. That was a success of the greatest importance, since the attitude of Italy was one of the significant problems occupying the Austrian diplomatic service in those decisive days of July and August 1914. And the question still remained open; therefore, it was a matter of employing all possible intelligence sources to obtain clarity.

At the outbreak of the World War, Italy had proclaimed its neutrality. In December 1914 negotiations were started between Vienna and Rome which dragged on lazily. Beginning in January 1915 the Austrian radio intercept service established the fact that Italy was turning more and more to the Allies, and that preliminary conversations were taking place in Paris between the Italian ambassador and the French Minister of Foreign Affairs, conversations which must be taken seriously. Vienna decided, therefore, on a countermove, and on 30 March 1915 made the Italian Government a proposal to relinquish the purely Italian portion of the southern Tyrol in return for the assurance of benevolent neutrality on the part of Italy until the end of the war, and of complete freedom of action for Austria in the Balkans.

The Italian Foreign Minister, Sonnino, then held several conversations with the French and English ambassadors, the results of which were again revealed in radio traffic picked up and deciphered by the Austrians. It could be clearly recognized that a much greater Austrian concession -- especially with regard to Trieste, Istria, and the Balkans -- would be necessary in order to influence the attitude of Italy decisively in favor of Austria. The greatest haste was also demanded in order to meet successfully the efforts of France and England. In Vienna, however, they stuck obstinately by a peculiar misinterpretation of strength ratios, and decided to wait.

The Italian Foreign Minister then officially turned down the Austrian offer as inadequate, and Italy decided to make its entry into the war on the side of the Allies. Early in April 1915 this intention of Italy could be recognized beyond doubt from several radiograms exchanged between Rome and London.

On 26 April France, England, and Russia concluded in London a secret treaty with Italy which obligated Italy to declare war on Austria within one month. In return, Italy was assured of the fulfillment of all its territorial claims and aspirations in Europe, and also of an equal share in the division of Turkey. The content of the London secret treaty was known in its essential points in Vienna on 30 April.

On 4 May Italy denounced the Three Power Pact; on 23 May it declared war on Austria-Hungary.

Apart from the previously mentioned information received by radio, which -- from a military point of view -- must exclude any factor of surprise from the start, the Austrian intercept service

succeeded during April and May 1915 in following the Italian assembly, especially behind the Isonzo. But instead of taking the clearly recognizable situation into account in any adequate fashion and massing strong forces in the southern Tyrol to create the base for a rapid thrust in the direction of Venice, in order thus to take the entire Italian assembly in the flank, the Austrian command had its principal forces drawn up on the Isonzo front to await here the enemy's attack. The consequence was that series of fruitless battles on the Isonzo which characterized the entire Italy-Austrian War.

The entire conduct of the Austrian command is all the more incomprehensible, since the Austrian espionage service had succeeded during the summer of 1914 in securing the most important Italian code, namely that for communications of the higher staffs, which actually came into use shortly after the outbreak of the war and which gave the Austrians an abundance of excellent information.¹

The Italian "Field Keys" had been solved by the Austrians back in June 1915. To be sure, they were changed on 10 July but the Austrian cipher section soon found the solution of the new ciphers. Subsequently the Italians changed their cryptographic systems very frequently, but this did not help them much. Early in October 1915 they put the "Cifrario Tascabile" into use, which the Austrians had bought long before the war. It had proved a profitable deal.

1. This was the so-called "Cifrario Rosso" which was used for traffic between the general staff and the army command.

For the rest, the "Cifrario Rosso" remained in force for almost a year. Not until 30 March 1916 did the Italian High Command forbid in a radiogram further use of this system in radio traffic, "since the suspicion that it was partially known by the enemy has been confirmed". In reality, it was entirely known to the Austrians. On 1 April the new system went into effect. Twenty-four hours later it had been solved by the Austrian cryptanalysts.

Probably rarely has a sequence of very important intelligence results been used to so slight a degree as in the first phase of the Italo-Austrian War. And therewith the course of the entire campaign was decided.

Not until the spring of 1916 did they try the obvious plan of a flank attack. With several German divisions, which had been requested and promised as reinforcements, they wanted to do what a year before would have been correct and might have been crowned by success, but what now could no longer be accomplished since the Italians had meanwhile materially strengthened the Tyrolese front. There was the added fact that the requested German divisions could not be spared, because the bleeding of the German army before Verdun had exceeded all expectations. The Austrian command then decided on an attack with its own (inadequate) means. As might be expected, after initial successes at Asiago and Arsiero, the attack bogged down and had to be broken off, because the Brusilov offensive had started which brought the entire Austrian eastern front into retreat.

In connection with this Austrian attack, there was a piece of deception which we shall not allow to pass without mention. In order

to mislead the Italians and to force Cadorna to hold his operational reserves in readiness behind an entirely different sector, the decision was reached at an interview between General Ronge, Chief of the Austrian Evidenzbuero, and representatives of the German General Staff to carry out a deceptive action on a large scale based on experiences of the intercept service. The Italians were to be fooled into believing that a German army was being brought up.

The only chance of success was by using the radio. The entire action had to be prepared very conscientiously and carefully, and carried out with the same care, if it were to succeed. For the execution of this action, a staff was formed, at the head of which stood the German von Bonin, at that time Major in the General Staff. He was charged with the tactical management of the deceptive measures. For the technical execution, a German radio company was employed which was under the command of the then Captain Meydam. Furthermore, a battalion of mountain light infantry was detailed for the purpose. The plan was to lead the Italians to believe, over the space of several weeks, that a German army, the headquarters of which had hitherto been in East Prussia (as far as I recall it was the Tenth Army) was moving up into the Kärnten area.

Meanwhile, it had become known to the Austrians that the Italians were preparing for a new attack on the Isonzo.

The radio company detailed for this deception had four heavy and four medium mobile radio stations. They began by having two of the heavy stations and a company of mountain infantry change trains as conspicuously as possible in Munich. The leader of the

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transport had his men drawn up before the train, gave them a series of general instructions, and then enjoined upon them the utmost secrecy. "No one needs to know that we belong to a German army going to the Italian theater," he declared at the end. The grins of several bystanders showed that the first seed had fallen on fruitful soil; the innate need of the German to tell something would take care that within 24 hours half of Munich would know all about the sending of a German army to the south.

During the transport, these people had to show themselves diligently, and to drop mysterious hints. At the location selected for army headquarters, they set up the first of the heavy stations. The transmitter was tuned up, and then communication was begun with two Austrian army radio stations. On the following day, the second heavy radio station was set up at a distance of some 15 kilometers. Both stations immediately entered into regular traffic with one another. For their radio traffic they used a cipher which had been produced especially for this purpose by the Austrian cipher expert Captain Figl; it was so constructed that the Italians could not fail to solve it, but the intention to mislead must not be evident in any event. For the rest, the manner of handling traffic at the German stations differed markedly from that of the Austrian stations so that both stations could not fail to be recognized at once as German.

A radiogram of this "army station" was transmitted to the garrison radio station at Munich with the request that mail arriving there for the staff of the Tenth Army be sent to ... in the Tyrol. Other messages went via Munich to Königsberg and had reference to the handling of supply, preparation of quarters for the troops, forwarding of mail, and the arrival

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of single formations belonging to the Tenth Army.

A few days later the two remaining heavy radio stations arrived in the area picked for the fake assembly, and entered into communication with the "army radio station" and with each other. They were supposed to represent corps stations. A second and a third company of mountain troops also arrived; they too had to show themselves as much as possible in the "assembly area"; they were quartered now in this and now in that place, and special billeting officers went through the entire region and labeled buildings and barns with the numbers of formations belonging to the Tenth Army.

At intervals of two days, the nine medium stations arrived and entered into traffic in the manner prescribed for them. They were supposed to pass for divisional stations.

The traffic grew more and more animated. The content of the messages now referred to the arrival of individual units, and had to be composed very carefully in order to make the fake transport movements agree with the capacity of the Austrian railways.

In order to help the Italians in their task of decipherment, various intentional errors and breaches of radio discipline were made; a few messages were sent in plain text. The handling of the entire traffic was managed so that the new radio net could not help but stand out clearly from the Austrian picture. It was intended to reveal to the Italians the entire "assembly area" of the German Tenth Army.

Now it was most important to ascertain how the Italian intercept service was reacting to this little game. A few days after the first stations had started operations, an Italian instruction to their own radio stations was intercepted and deciphered. It called for a limitation of their own operation so as not to "disturb interception of the German stations which had just appeared." A day later came the instruction "to follow most carefully all traffic at the German stations, since this was most important." A few days later several telephone conversations of the Italians were intercepted from which it could be recognized that the opposing Italian forces had been ordered to watch for any relief in the enemy lines and to ascertain when the first German troops showed themselves at the front. A couple of Austrian horse-drawn batteries, to which a number of German mountain troops had been assigned, had to drive around behind the front, go into position, fire a few shots to get the range, and thus little by little indicate the arrival of the German artillery.

Soon it could be noted from intercepted Italian radio traffic that the Italians were beginning to strengthen the opposing front and to set up operational reserve units behind it. The ruse had succeeded.

On 13 March 1916 Cardona began his fifth battle of the Isonzo. It brought him no more success than the four preceding; incidentally, he was holding a considerable portion of his troops behind the Kärnten front in expectation of the "German attack."

But the Austrian offensive on the Tyrolese front suffered a great delay through enormous snowfalls which made the entire district impassable. Instead of beginning in mid-March, it did not get going until two full months later.

A few days before the Austrian attack in the Tyrol, the deceptive station set up as "army radio station" began sending time signals for setting watches. This had always been a signal for an impending large scale attack. German mountain troops appeared at various points on the front, and had to carry on telephone conversations which they were sure would be heard by the Italian intercept stations. Twenty-four hours before the attack, all Austrian artillery assigned for the deceptive game began drumfire on the Italian positions, while already, on the day before, the radio stations had sent out orders for a change of position and then ceased sending; only the main radio station sent out mysterious X-signals.

Then the Austrian attack on the Tyrol broke loose. After initial successes it bogged down and ended indecisively. It had been prepared and carried out with totally inadequate means.

Soon the Austrian intercept service was able to recognize the bringing up of Italian reinforcements. In the night from 19 to 20 May, an Italian radiogram was deciphered from which dispositions for a great Italian counter-attack were learned. At 3 o'clock in the morning the decipherment was completed; an hour later the orders for countermeasures to break up the attack were already going out. On 1 June the Austrian intercept service

recognized the appearance of a new Italian radio station in the region north of Padua. Here the Italians were preparing strong forces for a great counteroffensive.

Meanwhile, in the east the Brusilov offensive had started. Reinforcements had to be sent hastily at the very moment when the superiority of the Italians on the Tyrolese front was increasing greatly. Part of the territory gained had to be sacrificed. The entire operation fizzled out without lasting results.

General Hoffmann later called the First World War the "war of missed opportunities," i.e., of opportunities missed by Germany to end the war decently. I should prefer to call this war a "war of halfway measures," or the "war of inadequacies." From beginning to end these appeared on all sides, but they were especially bad in the Italian campaign.

The whole action should have been based on a really big and decisive operation. A deceptive maneuver of the kind described above can be effective only once; it is hardly possible to repeat it with any prospect of success. Therefore, one should have saved these deceptive measures for a case where their execution must be really profitable. Instead, they made use of it where its effectiveness was allowed to peter out. The Austrian attack was made with too feeble forces. When it was done, history recorded another battle, but the Austrians had to write off what was in and of itself an excellent ruse which they had wasted uselessly.

Since the war between Italy and Austria developed chiefly as a war of position, the "Penkalas" achieved special importance here. One of the principal reasons why all Italian attacks, particularly

on the Isonzo, failed, lay in the fact that all preparations of the Italians were recognized by the Austrians in good time by listening to their telephone conversations, so that the necessary defense measures could be taken. Of course, the Italians likewise saved-dropped successfully on the Austrians, so that in this field things were equalized in the long run.

The Austrian intercept service in this theater attained its greatest importance in connection with the German-Austrian offensive in October and November 1917. Down to the autumn of 1917 the Austrians, thanks to their intercept service, had been able to frustrate all Italian attempts at an offensive and to maintain their front. Nevertheless, in September 1917 the situation was so tense that the Central Powers decided on a large scale attack. Nothing less could give the Austrians a breather.

The Austrian intercept service had learned meanwhile that the sector Flitsch-Tolmein seemed best suited for such an attack, in view of the grouping of the Italian forces. It was decided, therefore, to choose this sector. The German Fourteenth Army was directed into this area and was to force a break-through.

From 24 to 27 October followed the attack and break-through under the command of General Otto von Below. On the 28th Udine was occupied. Advancing along with the adjoining Austrian armies, the Tagliamento was crossed early in October. The Italian radio service had been thoroughly disorganized by the German attack. All movements of the Italians, all plans, and the entire constitution of their front could be recognized clearly. Scarcely had one

of the Italian radio stations taken up a new position when it announced in plain text "I am packing up," and then announced its new location. That showed that the retreat was continuing.

The entire offensive became a triumph of the Austrian intercept service. Soon, however, two things became evident from the intercepted radio traffic: first, that the Western Allies were bringing up strong forces to support the Italians; and secondly, that a strong new defensive front was being formed on the Piave.

On the Austrian side they were uncertain respecting the strength and organization of the new front. Then a long message from the chief of the Italian radio service gave absolute clarity. In its address this message listed all the higher units with the locations of their staff radio stations. This betrayed the entire organization of the new battle alignment, but showed that the army group opposing the Austrian and German troops was far too strong for the latter to think of overrunning the new front. Therefore, the decision was made to break off the offensive. Henceforth, the Piave remained the new front line.

In summing up, we must say that the results of the Austrian intercept service during the entire Italian campaign were so abundant and good that at times they far exceeded the results of the intercept service on the Russian front. Strangely enough, full advantage of this was never taken, except in connection with the last described attack in the fall of 1917. But at that time the proper moment had already been missed, due to general political and military developments.

The struggle was to flare up once more on the Austro-Italian front in the summer of 1918. Early in March the Austrian intercept service noticed that the English and French had begun to withdraw their troops from Italy. By mid-March it could be clearly seen that only the French XII and the English XIV Corps were left.

The Austrian attack was planned for mid-June. The intercept service began in the spring to strengthen its work because the listening stations which had become free in the east could be profitably used here. By the beginning of June more than 80 "Penkalas" had been installed on the Austrian southwest front.

The Austrian radio intercept stations also found a fruitful field of activity. There was, to be sure, on the Italian side a general order to use radio only in urgent cases, but the chief of the Italian army radio service required daily reports from all his stations, so that the Austrian intercept service was very well supplied with material day by day. The situation reminded one of the fairest days of the war in the east. All the prerequisites for the success of the Austrian attack were at hand.

But in this case the equalization of strength in the intercept field, which I have mentioned several times, showed up in an especially striking fashion. Not only had the Austrians been listening industriously, but so had the Italians. In spite of all orders to the contrary, the Austrians had used the telephones incautiously. The preparations for the attack, and even the precise hour of attack, had become known to the Italians.

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They abandoned their front lines and deluged the advancing Austrians with a hail of shells from batteries which had likewise shifted their position in time. The Austrian artillery preparation had been wasted on an empty area; the second Italian defense line was well equipped. The Austrian attack failed and the losses were heavy.

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A SECOND "ZIMMERMANN"

The description of the affair with the Zimmermann telegrams above has shown that the Allies during almost three years of World War I were in a position to decipher the diplomatic traffic of the Berlin Foreign Office and to derive a great deal of profit therefrom. In regard to Austria, something similar occurred in the course of the war, although in quite different form, and, indeed, in the following way:

Since 1913 Count Czernin had been in Bucharest as the Austrian ambassador. He was a diplomat of the old school, and likewise a polished society man and cavalier who not only knew his job but also knew how to take life in an agreeable fashion. Just when the event we are about to describe took place I can no longer recall exactly, but I believe it was before the outbreak of World War I. Count Czernin had taken a little ride in a cab and then gone into a cafe to spend a brief hour. While he was talking with a lady of his acquaintance at one of the tables, it suddenly occurred to him that he had left his brief case in the cab. He excused himself, hastened to the cab, which was waiting for him, only to discover that the brief case had vanished. The cab driver could give no explanation; he had left his carriage for a little while and claimed that he had not noticed a brief case in it. In this brief case there were a number of extremely important documents, including the cipher used by the Austrian embassy in Bucharest for communication with Vienna.

Count Czernin immediately reported the matter to the Bucharest police who willingly promised their aid, and immediately began investigations concerning the whereabouts of the brief case. Three days later Count Czernin got back his brief case undamaged and with all the contents.

Conscientiously Count Czernin had informed Vienna of the occurrence, and offered his resignation. Emperor Franz Joseph in his courteous fashion declined to accept the resignation, called the matter a regrettable oversight, and requested Count Czernin to continue in office. With that the whole affair was settled, and in the Foreign Office in Vienna it never occurred to anyone to change the cryptographic system, although its continued use contravened all principles of security; for any document which has been in strange hands for even a few hours without control must be regarded as compromised.

The first phase of World War I ran its well-known course. The attitude of Romania toward Austria became cooler and cooler; relations grew more and more tense; and finally, at the insistence of Russia and the Western Allies, Romania declared war on Austria in August 1916.

The course of the campaign was not what had been generally expected, and after a few months the Romanian army was crushed and Romania was conquered. Russia had not been able to give adequate assistance because, from a military point of view, Russia itself had already been forced to the defensive.

When the Austrian troops had occupied Bucharest, the dwellings of members of the former Romanian Government and other persons of high station were searched. There in the attic of the villa of the former Romanian Prime Minister Bratianu was found a box of photographic negatives. When they were studied more closely and the individual plates checked, some turned out to be photographic copies of all the documents which had been in the brief case of the Austrian ambassador, Count Czernin, at the time of its loss, among them the secret code. The Romanians had, therefore, been in a position to follow the entire telegraphic correspondence of the Viennese Foreign Office with the Austrian embassy in Bucharest, and also to decipher all messages enciphered in the same system and radioed to other Austrian embassies.

Meanwhile, Count Czernin had become Austria's Minister of Foreign Affairs. Not until now was the cryptographic system of the Foreign Office changed. However, the damage could not be repaired, for in 1917 the war had been virtually decided.

On the one hand Zimmermann, on the other Czernin! The Allied secret service could be quite satisfied with the Central Powers, since copies of the Austrian diplomatic secret code had been supplied to France and England by the Romanians.

It seems almost incredible that the two powers which had developed the intercept service to a high degree of perfection during World War I and whose military operations were based to a very great extent on its results, which therefore knew very well how exposed the communications of a country or of an army are to the attack of an

enemy, should have displayed at times such utter unconcern in respect to their own communications, an unconcern which could hardly be exceeded.

THE "JUDGEMENT OF GOD" AND ITS EXPLANATION

During World War I there was a German soldier song which contained, among others, the following couplet:

...For this campaign
Is no fast train... .

Although in general there is little logic and sense to soldiers' songs, the accuracy of this verse could not be disputed. From a campaign at express speed, such as had been expected in August 1914 there developed one which at best had the speed of a slow freight, and this was true on all fronts. There was only one exception, and that was the campaign 1916-17 against Romania. In four months this action was carried out from the beginning to a completely successful conclusion, and the enemy was utterly beaten. In those days in Austria and Germany they spoke of the Judgement of God which had fallen on this country. But they were careful never even to hint at what had really brought on this "Judgement of God."

In 1913 Romania had renewed its treaty of alliance with the Central Powers. The condition for any active participation in the war by Romania on the side of the Central Powers was that the attack must not be made by the Central Powers, and that Italy should immediately enter on the side of Austria and Germany. However, since Austria had let loose the war by its attack on Serbia, and since Italy took a waiting attitude, Romania proclaimed its neutrality on 3 August 1914. After the death of King Charles on 10 October 1914, it became more and more evident from month to month that Romania was turning more and more to the Allies. At the time of my sojourn in Romania in the spring of 1915, I could feel

plainly that sympathy for the Central Powers had receded greatly, and that the question of entering the war on the side of the Allies had become merely one of time and of a favorable opportunity.

Strangely enough, people in Austrian and German official circles simply would not believe this change. The Austrian ambassador, Count Czernin, sent to Vienna one report after the other in which he emphasized Romania's love of peace and stressed the fact that he, as representative of Austria, was being treated by all organs of the Romanian Government in the most respectful and cooperative fashion and that he was constantly being assured that Romania's entry into the war against Austria was a thing which could not even be discussed. The German ambassador took a similar position in his reports. On the other hand, the Austrian military attaché had his eyes wider open. From the spring of 1916 on, he reported earnest military preparations on the part of Romania which by their very nature could only be directed against Austria. The difference of opinion between the Austrian ambassador and the military attaché went so far that an open conflict broke out between them.

It must be admitted that the Romanians were able to deceive the diplomatic representatives of the Central Powers in masterful fashion regarding the true attitude of the government. The two ambassadors were invited on every occasion, the "traditional friendship" with Austria and Germany was diligently stressed, and the existence of any tension or of causes for conflict was positively denied.

Since the Romanian Government was in possession of the Austrian code, it could follow precisely the effect of its deceptive measures by reading the telegrams sent by Count Czernin to Vienna. For the

Romanians it was an extremely interesting play which was going on here behind the scenes.

Now while the official diplomatic representatives of the Central Powers continued their reports from the point of view that the Romanian Government intended to maintain absolute neutrality, the reports of the Austrian military attache took on more and more a tone of warning, especially after the beginning of the Brusilov offensive. These warnings finally led to a common consultation of the chiefs of staff of Austria and Germany during which it was decided to set up an increased security force along the Transylvanian border. A new Austrian First Army was formed, with a new German Ninth Army at its right; but both consisted solely of worn-out formations which had been withdrawn from the Russian front for rest and to be brought up to strength. Many of them consisted of very scant remnants without any fighting strength and needed to be built up almost entirely from new personnel. This was done without any haste because nobody believed there was any serious threat to the Austrian border in the southeast.

Meanwhile in Romania they were preparing for the attack; above all, the Russians urged Romania's entry into the war. On 27 August 1916, on a quiet Sunday afternoon, the Romanian ambassador in Vienna delivered a long-winded declaration of war, while in the same hour the Romanian troops began their advance.

The moment of Romania's entry into the war could not have been better chosen, for the Austrian offensive in Italy had bogged down and the Austrian troops there were engaged in severe defensive fighting. The Brusilov offensive was progressing beautifully, and a thrust by the Romanians could tie in with the advance of the Russians. Germany and Austria had their hands full trying to stop this Russian advance. Furthermore, Germany was badly tied up in the west before Verdun. Moreover, possession of the Austrian diplomatic code gave the Romanians extensive information and a feeling of great security. They were convinced that the collapse of Austria was impending, and that for the Romanian army it would merely involve more or less of a picnic. They had to hurry in order not to arrive too late for the division of the spoils.

The Romanian declaration of war was directed only against Austria-Hungary, but necessarily and automatically it involved Germany too. The first result of this declaration of war was the resignation in Germany of General Falkenhayn as Chief of the General Staff; the failures at Verdun and the crises on the Somme had helped bring this about. Hindenburg, with Ludendorff as First Quartermaster General, replaced Falkenhayn, while the latter assumed command of the German Ninth Army against Romania. General Arz von Straussenberg commanded the Austrian First Army. On Bulgarian soil along the southern frontier of Romania stood the Danube Army under General Kosch and the Bulgarian Third Army, the latter facing the Dobrudja.

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The Romanians had marshaled their main forces on the Transylvanian border. Immediately after the declaration of war, they started an attack on Transylvania from the east and the south, using an encircling operation with greatly superior forces against the German Ninth Army. Fighting a delaying action, the German units withdrew while the Romanians pressed forward over the eastern and southern Carpathians and turned in the direction of Klausenburg.

The Austrian and German intercept service had done no work against Romania until shortly before the outbreak of the war; in fact neither Romanian diplomatic nor army radio traffic had been monitored. Now and then they had listened to Romanian stations, but that was rather due to accident. Consequently, the Central Powers had no special experience with the handling of Romanian radio traffic before the end of July 1916. Not until early August were several receiving stations committed by the Germans and Austrians to begin a systematic monitoring. However, during their assembly the Romanians had been so cautious in their use of radio telegraphy that very little information could be gleaned. When war broke out on 27 August, the German and Austrian intercept service faced an utterly new problem.

The picture changed, however, within a few days. Scarcely had the Romanian advance gotten under way, and scarcely had the first engagement resulted, when the Romanians began to use the radio to their hearts' content and, to be sure, in a way that

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would have made the incautious Russians of 1914 turn pale with envy. They radiocd with fixed call signs in plain text; gave the names, numbers, and designations of troop units and formations; sent back all reconnaissance reports in plain language; and received their instructions and commands in clear. Of course, they used cipher for a large part of their radiograms, but this was done with so little skill, and the number of plain-text messages gave the Austrian cryptanalysts so many clues, that the cryptographic system was solved in a very short time.

And now on the part of the German and Austrian intercept service began an activity which was and remained unique during the entire war. The number of translators was hardly sufficient to translate all the intercepted messages. The evaluators were busy day and night turning the results into situation reports. In a short time they had a clear picture of the organization, strength, and intentions of the enemy, and of all of the difficulties which the enemy was experiencing in respect to supply and communications. Through their own radio traffic the Romanians gave away their operational and tactical situation so completely that even the handling of radio traffic by the Russians before and during the battle of Tannenberg seems simply superb in comparison with what went on here. For Tannenberg was something that happens only once, and one had to excuse the Russians because of the novelty in the use of this modern means of communication. Meanwhile, however, there had been two years of war and the Romanians of all people should have drawn a lesson for their own army from their practice in

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intercepting Austrian radio traffic. But now they acted as if they had never encountered the idea of an intercept service.

General Falkenhayn seized the opportunity which was thus offered him. Every three hours the radio evaluation center of his operational section had to supply a situation report on the enemy. For four weeks he withdrew into the interior of the country, deceiving the enemy. Then the situation was such as he required for his blow. From 26 to 29 September he crushed the Romanian left flank near Hermannstadt; in the following weeks he broke through the center of the Romanian line of battle near Fogaras, and immediately afterward in the battle before the Geisterwald drove the enemy back on Kronstadt. On 8 October Kronstadt was taken; on the 10th the passes of Türzburg and Predeal were occupied. At the same time, on the left of the German Ninth Army the Austrian First Army attacked the Romanian right wing and threw it back. Transylvania was reconquered within two weeks.

In the meantime, the Bulgarian Third Army had begun its attack from the south against the Dobrudja. Collaborating with the Bulgarians, the Austrian intercept service had set up a central office in Sofia, and from here was able to give the Bulgarian army valuable suggestions. On 6 September the bridgehead Tutrakan was taken; on 9 September Silistria was occupied. After the loss of Konstanza the Romanians withdrew from the Dobrudja late in October, and left the protection of the mouth of the Danube to the Russians.

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This first phase of the campaign had broken over the Romanian army like a thunderstorm. It could happen as it did only because the Romanian radio service supplied the enemy with all the details required by its intelligence service. It was a play with a grotesque charm which one was watching here; if anyone were to describe the details of the operations carried out on the basis of intercept results, it would give a story comparable with the most thrilling detective story.

The Romanians were deeply impressed by the precision with which the enemy was acting and, like the Russians in their day, were convinced that treachery was involved. They looked for traitors, replaced men in various positions, court-martialled a number of high officers, but in the main allowed their radio to operate in the same old way. They merely changed some cryptographic systems and did so with the cooperation of the French military mission which had meanwhile arrived.

But it happened that in the deciphering office of the Ninth Army there were two decipherers who had worked for some time solving French cryptographic systems. They were acquainted with a definite French tendency to be systematic. With the accumulated traffic, amounting to some 80 messages, they attacked the new system, and within six days achieved complete success. All told, the German and Austrian intercept service received and processed during the first two months of the war no less than 6,240 Romanian radiograms!

Meanwhile, the Romanians had once again united themselves together for determined resistance, and opposed all available troops to any further advance of the German Ninth Army over the Törzburg and Predeal Pass toward Bucharest. They were convinced

that the German attack would come here, and omitted strengthening their left wing. This circumstance could be recognized in all details from intercepted traffic. Falkenhayn therefore decided on a mighty surprise attack against the Romanian left wing. In mid-November at the Vulcan and Surduc Passes the right wing of the Army broke through the Romanian position, overran the main Romanian force on 17 November near Targu-Jiu, and on 21 November took Craiova. The out-flanked Romanians then had to abandon their resistance at the Roten-Turm Pass. On 23 November the Danube Army, which had learned from intercepted Romanian traffic of the withdrawal of some units, forced a crossing of the Danube near Swischtow by a surprise attack. The battle on the Argesul (1 - 5 December) ended with the defeat of the demoralized Romanian troops and with the evacuation of Bucharest. Covered by rear guard actions the Romanians retired behind the Sereth. The Romanian campaign was then concluded and settled into a war of position. The Russians, for whom Romania's entry into the war was supposed to bring relief, had been forced during the last phase of the struggle to send troops of their own to aid the Romanians.

At the conclusion of the Romanian campaign, three-fourths of the Romanian army had been annihilated and, save for a meager remnant, had ceased to exist.

Later on, the lightning campaign against Romania was ascribed to the outstanding strategy of General Field Marshall von Mackensen,

whose troops occupied Bucharest. Actually, von Mackensen was nominal commander-in-chief of the troops operating against Romania but only the "Army Group Mackensen", which was composed of the Danube Army and the Bulgarian Third Army, was directly under his command. This southern group was assigned only a secondary role during the entire campaign. The decisive operations took place on the northern front, and the focal point here lay with the Ninth Army. This army, however, would never have been able to deliver such decisive blows against the Romanians in Transylvania, and later on against their left wing in the north, if Romanian radio traffic had been handled according to modern principles of concealment. The only credit due Mackensen came from the crossing of the Danube near Swischtow, the battle of the Argesul, and the occupation of undefended Bucharest. All this was possible only thanks to Falkenhayn's operations - and thanks to Romanian radio traffic.

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THE INTERCEPT SERVICE IN THE BALKANS

The various campaigns and operations in the Balkans during the course of World War I were very largely influenced by the Austrian intercept service. In a number of individual actions the Austrians and Germans were successful solely because of the results of the interception of the technical means of communications employed by the enemy. To report on this in detail would far exceed the limits of this work. However, we must not fail to mention that, after their landing at Salonika, the Allies on their part devoted very great attention to the intercept service and were especially concerned with preventing intelligence material from reaching the enemy through their radio traffic. The greatest triumph in securing one's own radio traffic against enemy interception came for the Allies in September 1918. At that time, the French 122nd Division and the 17th Colonial Division succeeded in maintaining absolute radio silence up to the moment of their commitment at the front, so that neither their disembarkation nor their transport to the front was recognized by the enemy. According to an admission of the Bulgarians, the element of surprise, which was thus gained, was the reason for the defeat of the Central Powers in the Balkans.

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BREST-LITOVSK

One of the main goals of the Bolshevik Government immediately after it seized power was to bring the war to an end. Not merely the war between Russia and the Central Powers, but the World War as a whole and on all fronts. This was the burden of the appeals which went out by radio from Petersburg and Moscow. They were directed to the working population of the Western Powers, and to their organizations and representatives.

But it soon appeared that the political power of these organs was far too small to have any decisive influence on the attitude of the governments of these countries. On the basis of this discovery, the Soviet Government decided on separate negotiations with the Central Powers to bring about a separate peace. On 22 December at Brest-Litovsk conversations began between the Russian delegation headed by Joffe and the representatives of the Central Powers whose spokesman was, in the main, General Hoffmann. The course of the negotiations is in general well-known; what is not known, however, are certain circumstances which will be mentioned here for the first time.

The special character of these peace negotiations lay in the fact that here there sat at the conference table to end war not merely representatives of the two countries or groups of countries which were in a state of war, but that here two philosophies stood opposed to one another, between which - from the point of view of ideologies - there was no bridge; on the one side were the representatives of militarism,

imperialism, and capitalism; on the other the representatives of radical socialism, of anti-militarism, and of the international collaboration of the proletariat. From the beginning this created a hostile atmosphere. There was the added fact that the Bolshevik Government had only been in power a few weeks, and this in the greatest continental country on earth. On the side of the Central Powers there was, therefore, a very great interest in gaining insight into the actual situation in the newly created Soviet Union as well as into the thoughts of its delegation. Accordingly, in all haste a large radio intercept center was set up in Brest-Litovsk, whose task it was to intercept all Russian internal radio traffic and to exploit it for the information of the German and Austrian delegations. A great staff of evaluators and analysts with linguistic ability was at work day and night.

A teletype line for direct exchange of telegrams with the Soviet Government had been placed at the disposal of the Russian delegation. The Russians even had permission to use cipher. The Hughes teleprinter at Brest-Litovsk was operated by Russian personnel.

Without the Russian telegraphers' knowing anything about it, other teleprinters had been wired in parallel with the Hughes teleprinters used to transmit telegrams. The tapes produced here went at once to the cryptanalytic bureau set up especially for the purpose, where 15 cryptanalysts were sitting ready to begin work

at once. On the third day of the proceedings the German crypt-analytic service succeeded in solving the cryptographic system used by the Russians. From then on, all incoming and outgoing telegrams could be deciphered, and General Hoffmann received their content currently; sometimes the deciphered messages were laid before him during the conversations.

Aside from these two intercept devices, there was a third listening device installed in Brest-Litwosk. In the conference room of the Russian delegation the Germans had installed in the chandelier several microphones from which well-disguised leads ran to a listening room. Here sat several interpreters who took down in shorthand the conversations of the Russians. Moreover, behind the wallpaper in the living rooms of all members of the Russian delegation there had been concealed a series of microphones from which there were leads to the above-mentioned listening room. Thus, every conversation of the Russians could be heard.

The net result of these three listening devices was that the chief negotiator of the delegation of the Central Powers was not only very well-informed at all times regarding the sometimes very unclear situation within the Soviet Union and regarding the actual power of the new government, but was also informed regarding all instructions which the Russian delegation received, all reports which it sent to Moscow, and all ideas discussed within the delegation. They knew precisely how far

they could go, how far the Russians were ready to go, and what they could answer to the threats of Joffe and later of Trotzky. The Russian delegation could bring up anything it wished, but this did not make the slightest impression on General Hoffmann, since he often knew the enemy's situation better than the Russians themselves.

Twice it happened that General Hoffmann said too much in the heat of debate so that the Russians noticed that their correspondence with Moscow was being read by the Germans. Thereupon, they changed their cryptographic system but this too was broken in barely a week, and the total picture was now the same as before. The Russians, from a technical standpoint, found themselves in a hopeless defensive position and could not go a single step forward. Then on 10 February 1918 Trotzky declared that Russia regarded the war as ended and would dispense with a formal treaty of peace. He then broke off the negotiations.

On the German side this step by the Russians was used as a pretext for doing away with the armistice; beginning 18 February 1918 German troops occupied Livonia and Esthonia as far as Narva and thus threatened Petersburg. The Soviet Government found itself forced to give in, and on 3 March the treaty was signed at Brest-Litovsk.

Meanwhile, a government had been formed in the Ukraine which was quite independent of the Bolshevik Government; it had come into being with German support; on 9 February it concluded a

separate peace with Germany and Austria-Hungary which provided for the entry of German and Austrian troops into the territory of the Ukraine. Beginning 18 February the troops of the Central Powers marched into the Ukraine, occupied Kiev, Odessa, and Kharkov, and early in May advanced to the Don. In the south the Crimea was occupied.

In spite of the conclusion of peace the situation in the east remained very strained, indeed - from a military point of view - it became still less favorable than it had been up to February 1918, since in the enormous expanse of the western and eastern Ukraine there was stationed only a relatively thinly distributed force of the Central Powers. The Soviet Government on its part now set about organizing with great zeal a new "Red Army," and let it be recognized that it had no thought of tolerating permanently the situation in the Ukraine.

It was now necessary for the Central Powers to keep an exceptionally watchful eye on the development of the situation in the Soviet Union, in order to be protected from surprises. A whole net of radio intercept stations was set up by German and Austrian troops in the Ukraine and in the occupied northern territories, in order to monitor the entire radio traffic within Russia. The results were so good that actually a completely clear picture could be secured currently.

Along with their entire governmental apparatus, the Russians also had to reorganize their entire radio service, and in the early months they made the same mistake as once before by sending out their measures and arrangements all too frankly into space. But they soon made up for this error in another way. They began to send over their high-power transmitters a propaganda campaign in the German language which was directed to the German and Austrian soldiers. These transmissions were intercepted by all German receiving stations, and despite all security measures were soon trickling through everywhere. The German and the Austrian soldiers, weary of war, filled with the questions of a new social order, were eager to hear and to absorb what was coming out of this land of consistent socialism. The reports of the Russian transmitters, however, were calculated to undermine confidence in the leading class of one's own country. The system of radio propaganda, used here for the first time in history, began to bear very serious fruit in the summer of 1918. The war in the east was ended, to be sure, but - and this signified far more - the troops which had been left there began to drop out of the picture as a dependable military force for the Central Powers. At that time Russia was the first country to recognize and make use of the value and power of modern radio propaganda.

COMPIEGNE

The First World War showed during its course a number of parallel incidents in the intercept service, some of which strike one as remarkable, some as downright comical. The first of these parallels is between the battle of Tannenberg in the east, and the Battle of the Marne in the west; the last is between Brest-Litovsk in the east and Compiegne in the west.

In the negotiations at Brest-Litovsk the Germans listened to all communications from and to the Russian delegation, and deciphered them - insofar as was necessary. In the forest of Compiegne the same thing occurred, although in an abbreviated and simplified form.

On 8 November 1918 the German armistice delegation headed by Erzberger arrived at Allied Headquarters in the Forest of Compiegne. It remained there until 11 November. During this time all telegraphic traffic of the delegation was deciphered by members of the Deuxieme Bureau of the French General Staff. Even the famous dispatch to Erzberger: "Try for milder terms; if not obtainable, sign nevertheless." was deciphered by the French. To a certain extent, this decided the fate of the defeated partner in the negotiations. The interception and decipherment of the German telegrams to and from Compiegne were the last act of the intercept service during World War I.

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PART II.

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THE GERMAN INTERCEPT SERVICE

AFTER THE END OF WORLD WAR I

The collapse in the west and the armistice in the Forest of Compiègne ended the First World War. At least in the west. In the east the struggle went on in a new form; in the Ukraine, in the Baltic provinces, and along the Polish frontier, since the Poles had announced extensive claims and had set up a new army, and since there was fighting in the border regions. On the German side, volunteer corps were formed. In Berlin the National Ministry of Defense was created; a small remainder of the general staff took up its work anew.

The German intercept service likewise began immediately, under the changed conditions, a task adapted to the new situation. All garrison radio stations were reoriented for intercept service, which they had to carry on along with their own traffic. It was a question of following developments in the Soviet Union where civil war had flared up. Moreover, the situation in Hungary required the closest attention. In Berlin, in Friedrichstrasse, a new central office was set up for the intercept service and the cryptanalytic section. The then Lieutenant Colonel Buschenhagen took charge. He had been concerned with the German radio deception in Italy and had subsequently worked in the intercept service at Grand Headquarters.

This newly created office bore the designation "Volunteer

Evaluation Office of the OHL" and consisted at first of a small group, which was still more reduced in a short time when various participants found more promising jobs in private industry. Buschenhagen now endeavored to create a new group which would form the basis for the subsequent development of this branch of the service. At the same time a Captain Selchow, who had likewise been active in the intercept service during the war and had for a time headed the cryptanalytic group of the OHL, set up a bureau in the Foreign Office which was occupied with the development of cryptographic systems and their employment in diplomatic correspondence and also - and this was the novelty - with the decipherment of foreign systems. The assignment covered foreign diplomatic radio traffic.

Thus after the end of the war there ensued the typical German phenomenon, that instead of combining all energies to attain the greatest possible useful results, there began a splitting up, a struggle between rivals. To the outside world the creation of the two bureaus was justified by saying that the "Bureau Buschenhagen" was to occupy itself with cryptanalysis and evaluation of foreign military radio traffic, while "Bureau C of the Foreign Office" was to carry out cryptanalysis of foreign diplomatic cryptographic systems. In practice, however, it was by no means easy to draw the line between them since the radio traffic of a military attaché, for example, can fall both into the military and

into the diplomatic circle of interest. Furthermore, in solving a cryptographic system it is an open question where the content of the messages to be deciphered will lie. Furthermore, a cryptographic system - no matter where it is used - is simply a cryptographic system, which has to be solved by the same methods without regard for the use to which it may be put.

The methods of cryptanalysis had to be the same, naturally, in both bureaus, and the experience and practical application were the same. Any knowledge gathered in one of the two bureaus must also be of value to the work of the other.

With rational collaboration between the two offices, it would have been possible in the long run to avoid duplication and one could have employed the scanty personnel available in a rational manner. However, anyone who knows German conditions will not be astonished if I tell him that, as soon as the two offices had been set up, there sprang up a mutual jealousy, an effort on the part of each to out-strip the other, to find out as much as possible from the other without giving anything in return, and to hold itself apart as far as possible. There was an attempt, to be sure, to keep up appearances and to arrange a sort of exchange of ideas, but from the beginning these attempts were not based on any honest intention, so that no really sensible collaboration came about, either during the period of organization of the two bureaus or later. Of course, with the small number of really high-grade cryptanalysts available, this meant a very impractical

use of talent and many years passed before the two offices had developed an adequate number of good cryptanalysts.

While with Bureau C of the Foreign Office the main emphasis was on cryptanalysis, in the control office of the intercept service of the National Ministry of Defense, the main emphasis soon turned to the field of so-called evaluation, i.e., to the systematic piecing together of numerous single phenomena in foreign radio traffic for the purpose of getting an over-all picture of the situation in the area to be observed. That was to the point, and corresponded to the duties of an intercept control station attached to the highest command of the armed forces of a country. The result, however, was that soon there broke out an envious competition between the sections "Cryptanalysis" and "Evaluation", regarding which more will be said later.

As already mentioned, immediately after the end of the Great War, fighting had broken out between the Poles and Germans along the newly established boundary in the east. On the German side so-called Border Guard Armies were set up; one Border Guard Army South with its chief command in Breslau, and a second Border Guard Army North with its chief command in the vicinity of Hammerstein. These consisted in the main of volunteer formations; the command, however, already belonged to the cadre of the newly created Reichswehr. In both Border Guard Armies evaluation offices were set up for the intercept service, and the attempt was made to intercept

Polish traffic both by radio and by wire. Since the Poles had no experience in this field, they used their technical means of communication in a very carefree fashion, and thus gave the German intercept service a vast amount of good information. All preparations and plans of the Poles, all proposed undertakings, and all details regarding difficulties encountered in them were revealed to the German intercept service, so that it was almost always possible to start countermeasures in time.

Here in the east there was a repetition of the situation which had existed on the Russian front during World War I. With the internal situation of those days in Germany, with the great variety of political currents, with the constantly recurring, severe internal tensions, with the militia-like character of the relatively feeble border guard formations, it would hardly have been possible to safeguard the German frontier in the east to the extent it was, had not constant knowledge of events among the Poles put the German command in a position to intervene at the danger points in such effective fashion that the enemy was always forced to take the defensive. Here the Poles had to pay the same tuition fees that the Russians had had to pay at the beginning of World War I. Of course, they learned their lesson more quickly than the Russians and governed themselves accordingly. We shall have something to say on this point later.

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THE WINKER CASE

Older readers may perhaps recall an episode which occurred in 1906 in the vicinity of Berlin and which, under the title "The Captain of Koepenick," formed a favorite subject of conversation for many years and, in a sense, even became a part of German history. For those to whom this theme is new we will report the occurrence briefly.

On a beautiful summer Sunday morning a small detachment of German soldiers under the charge of a non-commissioned officer was marching through the little old city of Koepenick, southeast of Berlin. In the vicinity of the city hall, a man in captain's uniform met them, to whom the non-commissioned officer reported his detail in accordance with regulations. Thereupon he was ordered by the captain to march with him to the Koepenick city hall, since he (the captain) had the mission of arresting the mayor because of serious malfeasance in office.

The non-commissioned officer saluted snappily, had his formation about-face, and marched his little force under the command of the captain to the city hall. The entrances were occupied, and the captain, along with the non-commissioned officer and two men, betook himself to the office of the mayor where the latter was told that he was under arrest because of serious irregularities, and was to turn over the keys, in particular that of the city strong box, to the captain at once. This was done, whereupon the mayor was led away; the detachment of troops departed; the captain remained in the

building. On the following day it turned out that the whole affair was a bluff; the supposed captain had been a shoemaker, Wilhelm Voigt, who had already been convicted repeatedly. He had procured a captain's uniform and relying, correctly enough, on the absolute obedience in the German army to the insignia of a higher rank, had used this occasion to appropriate with the aid of this small detachment, all the money he could lay hands on in the town hall, and then had vanished with it.

There was a great deal of laughter about the affair later on, and it was called "typically Prussian," although people were inclined to admit that it probably could happen but once. It probably was typically Prussian, but it can be said that it would only happen once as far as the external circumstances were concerned; Koepenick pranks of like type have often occurred in Germany especially in Prussia; only they were less talked about.

The event described above has been mentioned here, because an event which took place in the summer of 1919 in the Border Guard Command South in Breslau reminds one vividly of the Captain of Koepenick, save that in Breslau matters were far more serious.

One forenoon in March 1919 there appeared in "St. Petersburg Court" in the Teichstrasse in Breslau, where the Army High Command (South) was stationed, a gentleman in army uniform, having the insignia of a technical officer with the rank of major, to see the head of the intercept service. He introduced himself as Dr. Winiker,

private scholar and teacher at the Institute of Technology in Berlin, and declared that he, along with all students of this institution, had placed himself at the disposal of the Border Defense against Poland. He himself had been ordered to the Army High Command (South) in Breslau by the head of the communication system in the new Defense Ministry because of his linguistic ability, and was now placing himself at its disposal.

Winiker gave the impression of a man well versed in the ways of the world and possessing good manners; he was very sociable and in a short time was known all over the place. He was not a friend of much work, in contrast to this, however, a friend of long drawn-out conversations and gossip. Since he possessed a complete command of the Polish language, he was employed in the translation of Polish documents. He telephoned to Berlin almost daily, especially to numbers in the Defense Ministry, and made a great showing of his far-reaching connections. Since his family - as he declared - was living in Berlin, he sometimes traveled from Breslau to Berlin over the weekend, and as a rule, did not return until some time the following Monday. These trips always furnished him with more material for chats in his circle of comrades in Breslau. It was rather remarkable that on his journeys between Berlin and Breslau he nearly always met someone who was very well informed on the situation in Poland. At that time no one in Breslau attached any significance to this circumstance, but on the contrary, they were only interested in the stories told by Winiker.

A few weeks after Winiker's arrival, various secret papers began to disappear from the main office of the intercept service, as well as from the office of the head of the communications system, to which the intercept service was subordinate; these, however, generally reappeared elsewhere. As a rule, it so happened that they disappeared toward the weekend, and reappeared on one of the first days of the following week.

It took a very long time before one began to pay attention to the legality of these happenings. After some time it was established that the Poles at different times had information at their disposal which they could have acquired only through treachery. In the meantime, Winiker lived in Breslau in a good hotel, boasted about his excellent connections in Berlin and his private wealth, and, wherever possible, incurred debts.

The months passed until the beginning of August 1919. Then on a Saturday forenoon, there disappeared from the private office of the head of the communications system a strictly secret map, on which were minutely drawn the complete wire connections of the Southern Army. This disappearance was immediately discovered and created great excitement. Not until Monday, when Dr. Winiker failed to report for duty, did they become suspicious and make inquiries at his hotel, only to discover that Dr. Winiker had vanished leaving behind him nothing but a large unpaid hotel bill.

Now an investigation was begun which showed that Winiker was

neither a doctor nor a professor at the Institute of Technology in Berlin, but an ordinary spy who had brazened his way into the Defense Ministry in Berlin through his personality and references to his outside connections in the same way that he had deceived the men in Breslau. They now found out that Winiker had undertaken, while in Breslau, to obtain for himself knowledge of the most secret matters, which he then delivered on his journeys between Breslau and Berlin to liaison men of the Polish secret service.

The incident was hushed up as much as possible in the office of the Army High Command (South) because the affair was too shameful. All inquiries as to what had become of the capable co-worker yielded no results. The episode has been related here because, for one thing, it is symptomatic of German conditions, but also because the effects of this incident were very far-reaching. Winiker had communicated to the Poles all results of the German intercept service, and had given them valuable pointers on what not to do in radio traffic. This gave the Poles their first lesson in regard to camouflage and one must admit that they learned to follow these instructions in a comparatively short time.

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THE WORK OF THE GERMAN INTERCEPT SERVICE

In February 1920 the "Volunteer Evaluation Office of the Army High Command" moved from Friederichstrasse to the Defense Ministry Building in Bendlerstrasse. The office now received the designation "Cipher Bureau of the Army High Command," and belonged to the "Abwehr"* Section as Group II. This merging with the "Abwehr" Section lasted only a few years. Since the intercept service had to work with personnel and equipment of the communication troops, there naturally followed a close connection with the Inspection of Communications Troops. In time this led to friction between the Abwehr Section and the Inspection of Communications Troops, so that eventually the intercept service was wholly subordinated to the Inspection of Communications Troops. Of course, to a certain extent cooperation with the Abwehr Section was still maintained; this was, however, more of an informational character.

In the years 1920-1925 the task of the German Intercept Service consisted in watching the entire international press radio service. The intercepts were written up in brief reviews, and gave the government valuable insight and information of a political and economic character. In addition, they turned more and more to the expansion of the cryptanalytic group and the interception of international diplomatic radio traffic. This work proceeded

* Abwehr = counterintelligence

rather slowly, but was carried on very systematically and in time showed gradually increasing results. At that time they were especially successful in deciphering Italian diplomatic traffic, and in this way derived from the reports of the Italian ambassadors and legates in London, Paris, Moscow, and other places, a good insight into the governmental proceedings of these nations.

Viewed as a whole, the focal point of the work of the German intercept service lay in the field of politics. With regard to military matters the work was limited to the observation of events in the Russian Civil War and the course of the Greco-Turkish War. Especially in regard to occurrences in the Soviet Union it was possible for the German intercept service to pursue events in almost uninterrupted sequence. It was especially interesting, however, to follow the radio traffic on both sides, and in particular on the Russian side during the Russo-Polish War in 1920.

The course of this campaign was one of the first noteworthy things in the period following 1918. At that time Russia found itself in a state of civil war which raged everywhere. The armies of Kolchak, Denikin, Wrangel, Petljura, Judenich, Miller, and various other White Russian leaders were seriously threatening from all sides the structure of the newly arisen Soviet Union. Resurrected Poland took advantage of this condition to declare war on the Soviet Union, and to annex large areas. At that time the Poles succeeded in pushing forward and reaching the Dnieper,

in crossing it at some points, and in advancing beyond Volhynia toward the south.

A very critical situation resulted for the Soviet Union, but this soon led to an astounding reaction; the result was that within the territories dominated by the Soviet government all political dissension ceased at once and there arose a united defensive front against Poland. Even high officers of the former Czarist army placed themselves at the disposal of the Soviet government, and the "Third War for the Fatherland" began.

The onrush of the Polish troops was brought to a halt, and in bold advances, units of the Red Army succeeded in throwing the Polish forces back a long way. It was particularly the cavalry army of Budjennyj which was able to achieve surprising results in the beginning, until there came that famous "Miracle at the Vistula," which was no miracle at all but the result of very matter-of-fact causes. These were as follows:

During World War I the Russians had had to pay dearly for their lessons in the proper use of radio in the face of the German intercept service. Nevertheless, they had begun to learn and in the course of three years of the war had in some cases made very good progress. The collapse of the Czarist army resulted in scattering all previous experience and knowledge to the wind like chaff, and the newly arisen Red Army virtually had to begin again from the beginning. That meant that in respect to the security

of their own radio traffic they were precisely where the Czarist army had been in 1914.

The command of the Red Army attached great importance to the use of wireless telegraphy in general and especially in the army. When the new defense armies were set up against the Polish invader, they were equipped abundantly with radio apparatus from the remaining stocks of the old Czarist army. This equipment was - relatively - far more extensive than any one of the Czarist armies had ever had during the World War.

The shock of the Russian forces, which had passed to the attack, threw back the Polish front and pressed it nearer and nearer to the Vistula. It looked as though there would be a vast battle of annihilation in the great bend of the Vistula, but the Russian successes suddenly began to diminish until finally there came the well-known, decisive turning point. This came about in the following way.

In the first phase of the Russian attack, the Polish command had virtually no information regarding the organization, strength, offensive power, and intended direction of attack of the Russian armies. Thus the Russians were able to take advantage of the element of surprise to a full extent. However, scarcely had the Polish front begun to move backward when the Russians began to use radio on a large scale. This was particularly the case with the cavalry army of Budjennyj.

Some eight years after this campaign, the Polish Colonel Szieszynski revealed the secrets of those days in a brief memoir,* and cited a number of interesting radiograms which were sent by the Russians during those weeks, partly in clear, partly in a very primitive cryptographic system, and which were intercepted and deciphered by the Polish intercept service. The Polish intercept service had been built up from former Austrian-Polish and German-Polish officers as soon as the Polish army was created. From the events mentioned in the Winiker case, they had had a good opportunity to gather experience and to train themselves.

When the Polish-Russian War broke out, there was a small but nevertheless very useful Polish listening organization. It was immediately committed for the monitoring of Russian military traffic, and after the beginning of the Russian offensive afforded such an abundance of fine and superfine intelligence regarding the enemy that we can only compare with these events those associated with the cavalry corps of von der Marwitz in 1914, but with the difference that the individual messages of the Russians were much more comprehensive and informative than those sent in its day by the cavalry corps of von der Marwitz. In content the Russian telegrams closely approached those from the days of the battle of Tannenberg. In particular, it was the cavalry army of Budjennyj which soon distinguished itself in this direction. Such conduct

* For the Polish Signal Corps.

must naturally lead to a serious reverse sooner or later, especially since the Poles for their part made no use of radio due to lack of apparatus, and hence were not supplying the Russian intercept service, which did not exist to any appreciable extent, with information of like value. The Russians revealed their measures and intentions to such a degree that the Polish general staff, in collaboration with the French military mission, could proceed successfully with the preparation and execution of a counterblow. This was the famous "Miracle of the Vistula," that astoundingly striking parallel to the battle of the Marne, which gave a decisive turn to the entire campaign and put the Poles in a position to secure a drawing of the boundary virtually as it remained until the autumn of 1939.

From the gigantic mass of radio messages intercepted by the Poles we reproduce a few below.

From a telegram intercepted 2 July 1920 from the chief of the radio service of the Bolshevik Fourth Army, Nr. 517/op. taj., it could be learned that the radio station of the 48th Infantry Division was to be moved to Dzisna to serve the staff of the Fourth Army. In this way the Polish intelligence service received definite confirmation of earlier reports of the formation of a Fourth Army. At the same time, the location of the army staff was disclosed.

On 24 July the chief of the signal service of the 16th Army

revealed in a service message through the signal officer of the 10th Infantry Division the location of the army staff in Baranovichi.

On 26 July the chief of the radio station of the Fourth Infantry Division informed the chief of the radio station of the 54th Infantry Division of his location in the village of Olszana.

On 30 July the heads of the radio station of the 10th and 53rd Infantry Divisions did the same thing. This was repeated during the entire war, so that the Poles knew the precise location of all higher Russian staffs, and hence the grouping of the enemy.

On 10 August a service telegram of the War Commissar of the Fourth Army was intercepted which was deciphered on 12 August; its wording was as follows:

"To the War Commissars of the 10th, 12th, 15th, 53rd, 54th, and 48th Divisions, to the Third Cavalry Corps, to the 164th Brigade, and to the Quartermaster Section of the Fourth Army: from the moment of the arrival of this present message the use of cipher 'Natisk' is forbidden; in its place the key 'Revolucija' will be used for communication of division staffs with army staffs. The key 'Natisk' may be used up to receipt of the key 'Revolucija', which has been dispatched by courier. Then it is to be retired from use, and sent to the field staff of the army. Report on receipt of the key and on measures undertaken."

In July 1920 the Poles learned from most important operational telegrams of the commander of the cavalry army, General Budjennyj,

which were dated Korzec, 4 July at 2030 hours, precise details of his intended advance and the military composition of the army, which was given in the open address of the telegram: "To the commanders of the 4th, 6th, 11th, and 14th Cavalry Divisions and to the Commander of the 45th Infantry Division."

On 5 July the first operational order of the Commander of the Fourth Army, General Tschuwaev [?], was heard, which was addressed to the commanders of the 12th, 53rd, and 18th Infantry Divisions, the Commander of the 143rd Brigade, and the Commander of the III Cavalry Corps.

On 6 July a similar order from the commander of the 12th Army was intercepted.

These three, almost simultaneous orders were the basic orders of the three Russian army commanders for the beginning of a new stage of the Russian offensive.

Such orders in enormous number were intercepted and deciphered during the month of July. These intercepted telegrams were usually deciphered on the same day, or on the following day at the latest, and were brought to the immediate notice of the II Section of the General Staff as well as to that of the Operations Section. The Russian III Cavalry Corps distinguished itself particularly in this respect; it supplied the Polish intercept service with at least one very informative radiogram daily.

The events during the Polish-Russian War were also observed and evaluated by the German intercept service so that day by day the troop organization of both sides and the course of events could be followed by use of large maps. This was the first training which the reconstituted intercept service received and its first opportunity for practice.

At the beginning of 1920 the total strength of the central office of the German intercept service in Bendlerstrasse consisted of some 12 persons. Then they began to expand both the cryptanalytic and the evaluation groups. This program, however, was not easy to carry out, since the organs of the Inter-Allied Military Control Commission were endeavoring to follow closely all happenings in the National Ministry of Defense. The Germans tried with all means in their power to deceive these control officers. The cryptanalytic group was transferred in part to Grunewald. To the outside world the evaluation group became a newspaper translation office, and in this way it was possible again and again to escape the threatened dissolution of the intercept center. For the intercept service had been strictly forbidden to the German Reichswehr by the Inter-Allied Military Control Commission. The cipher bureau was only authorized to develop, reproduce, and distribute cryptographic systems for German use. Any unauthorized decipherment of foreign cryptographic systems was forbidden by the Inter-allied Military Control Commission. A few times the Inter-Allied

surveillance organs had gotten on the trace of the activity of the German intercept service, and there was a regular fox-hunt. But in each case the matter turned out favorably for the German intercept center.

While the German intercept service had thus far limited itself to interception of foreign radio traffic, in 1925 at the intercept center in Bendlerstrasse an office was set up which was concerned with listening to telephone conversations. In the main it was a question of listening to conversations of the Russian embassy and the Russian military attaché. In a special room a series of switchboards was installed, and every time a telephone at the Russian embassy on Unter den Linden became active, a flap fell down, and the interpreter on duty could listen to the conversation, and if necessary could even record it with a magnetophone. Later the Germans also began observing the British and French embassies, and the results of this activity not only proved of great interest because of the direct information, but also indirectly, since they gave such good insight into what was going on at these embassies that the cryptanalysis of enciphered messages emanating from them was in many cases greatly facilitated.

In spite of all budgetary difficulties and in spite of the surveillance of the Inter-Allied Military Control Commission, the expansion of the cryptanalytic group and the evaluation group of the cipher bureau made good progress, whereby the main emphasis

rested more on cryptanalysis than on evaluation. This situation did not change when, beginning in 1923, an increased monitoring of the radio traffic of foreign armies began. In particular, the observation of the radio service of the Polish airforce, and the results achieved thereby, lent charm and stimulus for a further extension of the intercept and evaluation service in the purely military field. A sound balancing of the interests of the two branches of work would have been the only correct solution, since, in the framework of the army, the focal point of the work must necessarily lie in a purely military field.

Suprisingly, however, at that time another development gained the upper hand, namely, the defense Ministry meddled in purely political affairs and especially foreign political affairs. A deciphered diplomatic radiogram offered far more material for lectures, conversations, and interesting discussions than did the determination of military details about the armed forces of foreign countries.

Naturally, the Foreign Office did not like this development at all, and there was constant tension and friction between "Bureau C" and the "Cipher Bureau." Another result was that an increasingly sharp contest arose between the evaluation group and the cryptanalytic group, since the latter always

wanted the best personnel for itself. In most cases the cryptanalytic group was successful since the Defense Ministry, as mentioned above, was far more interested in political proceedings than in military establishments, and in addition strangely enough, the idea prevailed that a higher degree of intelligence was required for cryptanalysis than for the scientific work of evaluation.

Such an installation, which might have been justified in 1914 or 1915 but which now ignored the facts completely, later proved to have ominously detrimental results for the German intercept service, especially during World War II. The present-day pursuit of evaluation in the intercept field requires such a wealth of knowledge of the organization, tactics, structure, and equipment of foreign armies, and above all, such a far-reaching knowledge of the structure and employment of foreign communications troops, such an intense mental projection into the course of operations, that only a high degree of intelligence coupled with intensive training extending over a period of years is able to produce personnel who are highly qualified for this work.

In contrast to this, the focal point in cryptanalysis lies in the field of statistics, which can be much more rapidly mastered. It is, however, characteristic of cryptanalysis that it is surrounded by an air of mystery, and - supported by this rimbous - is able to arouse more interest.

Now, while the cryptanalytic group was expanding more and more,

the evaluation group remained restricted essentially to a very small group of persons. This picture became still more marked in the autumn of 1928 when Major Kesselring (who later became General Field Marshal), as delegate for the personnel retrenchment program, ordered a further reduction in personnel in the military evaluation group.

As mentioned above, the results of observing the radio traffic of the Polish air force spurred the Germans on to an intense vigilance regarding the radio systems of the armed forces of the countries bordering on Germany. At that time the Polish air force was being built up and delivered an extraordinarily large volume of radio traffic, which was sent partly in plain text and partly in secret text. The German cryptanalysts were successful in breaking the system used by the Polish air force, and thus were able to read all its enciphered radio traffic.

The results were so voluminous that the German evaluation service, insofar as collective proceedings and details of the Polish air force were concerned - no matter in what field - was able to obtain the very best kind of information. After a few months they knew every airplane with its number and engine number, every pilot, every officer, all details of equipment, organization, structure, tactical views, preparedness for commitment, etc., so completely as has perhaps never before or since been the case in the German intercept service. One day, however, this fine source of information was stopped by the following event:

The Polish espionage service had been successful in obtaining the services of a German railway postal clerk working between Breslau and Berlin. This clerk, whose duty it was to sort the mail addressed to Berlin which came into Breslau and Frankfort on the Oder, had received instructions from the Polish secret service to hold back pieces of mail bearing certain addresses, and on arrival in Berlin to hand them over to a confidential agent who carefully opened the envelopes, looked over the contents, photostated them, carefully resealed the envelopes, and on the same day returned them to the clerk for forwarding.

This work proceeded very smoothly for several months until a chance discovery revealed the activity of the railway postal clerk. He was followed, but plunged into the Landwehr Canal and drowned. His body was recovered the next day immediately in front of the Defense Ministry Building.

The Polish intelligence service had obtained from this postal clerk information that the German intercept stations in Breslau and Frankfort on the Oder were engaged in watching the Polish air force traffic, and were able to ascertain from the intercepted mail just how far the Polish enciphered telegrams were being deciphered by the Germans, since the deciphering of these telegrams was not done in Berlin but in the individual intercept stations. The Poles therefore changed their system and substituted for it one that was extraordinarily complicated and could not be broken by

the Germans for several years. In addition, they restricted their radio traffic so greatly, both as to volume and content, that there was no comparison at all between the present results and those formerly achieved.

THE OBSERVATION OF MANEUVERS

The year 1928 signified a turning point for the German intercept service inasmuch as from this year on the actual duties of a military intercept service began to be cultivated more than hitherto. In part this was a natural development, because in most of the states of Europe down to 1928 there had been no maneuvers on a large scale. The possibility of training the intercept service in the observation of the course of military operations was therefore present only to a very limited degree. Now a maneuver is a military action which in its essence closely approaches a state of war. The intercept service of the armed forces of a country has the task of training itself for the observation of the radio traffic of a potential opponent in time of war. If the German intercept service had transferred its primary interest to the observation of political events, that would have been an unnatural phenomenon. Of course, this continued to be the case, but, nevertheless, on the initiative of a few men, the proper task of the German military intercept service, namely, the observation of foreign armies, began to gain in importance.

The first opportunity for carrying on an observation of regular maneuvers was afforded by the Rhineland maneuvers in 1928. These began with a crossing of the Mosel near Trier by the British troops, and continued during the course of a week into the vicinity

of Euskirchen. At that time the German intercept service succeeded for the first time in following very exactly the entire course of the maneuvers and in reconstructing the progress of operations in all details.

The next opportunity was afforded in 1929 by the maneuvers in Czechoslovakia and Poland. The Czech maneuvers at that time took place somewhere in the neighborhood of Olmuetz, and one of the German cryptanalysts succeeded in solving within six hours the cryptographic system employed. That permitted such extensive insight into the course of the maneuvers that these could be reconstructed in the same way as the Rhineland maneuvers. The German intercept service was not quite so successful that year in observing the Polish maneuvers in the vicinity of Lida. To be sure, here too they succeeded in recognizing in general the entire course and the organization of the troops; however, the way the Poles used radio and the cryptographic system which they employed caused such difficulty that only after a considerable time was it possible to gain insight into the details.

The observation of these three maneuvers revealed that the three countries in question differed greatly in their use of radiotelegraphy. Consequently, it was necessary to adapt the commitment of intercept units, direction finding units, evaluation and cryptanalytic sections to the condition of each individual case. Nevertheless, one could say even now that when following

foreign maneuvers results could be achieved in every case, if the tactics employed in commitment were sensible, and if the units could feel their way into the radio situation of the country to be observed. The extent of this success might vary according to circumstances, but in all cases good information was to be expected.

That meant that the intercept service, if employed properly, must necessarily gain great significance in a coming war. If I say "if employed properly," then I mean that the commitment of one's own monitoring organs must be carried out very carefully and must be adapted to the situations then existing; but I also mean that for this type of evaluation of the results of the observations, it is of the greatest importance to have a large number of really first-class men who must be appropriately trained and constantly given additional training. No improvisation is possible in this field. If one does improvise, one is exposing himself to the danger that not only will the value of the intercept service be diminished by falsely drawn conclusions, but that this service in the hands of inexperienced people can become a great danger for one's own command.

From 1930 on there began a long series of French maneuvers and large-scale exercises. They occurred chiefly in the northeastern part of France, specifically in the French defense districts VI, VII, and XX. Almost all were observed by the German intercept service and in almost all cases it was possible to gain extremely

far-reaching insight not only into the course of the maneuvers but also with respect to troop organization, tactics employed, weapons committed, march performance, employment of the air force, etc. France turned out to be the country whose maneuvers could be observed in an especially favorable fashion. We shall speak later of the reasons for this.

It was interesting not only to follow the land maneuvers but also to observe drills and maneuvers of the French air force. Thus the German intercept service succeeded, while observing an air exercise in the vicinity of Nancy, in calculating precisely how the French warning service was related to the speed of the attacking enemy. It was possible to set up comparative time-tables which showed on a time basis the movement of the incoming units and showed simultaneously the manner in which the warning service reacted. It turned out that in all cases the warning service went into operation promptly at the starting point, but alerted the objects to be warned much too late, and this based on the relatively low flying-speed of those days!

In observing French air maneuvers in the area of Grenoble, the German intercept service had succeeded in reconstructing the air warning system, the reporting system, and the compass points used by the spotting system, all by means of short radio reports.

The German intercept service succeeded in following some French maneuvers, e.g., on the Aisne in 1932 and on the Marne,

to such an extent that the results were considerably more comprehensive than the reports of all the military attachés and agents employed.

The copiousness of the results of monitoring French maneuvers was exceeded only by the results which could be obtained against the Italians. The Italians used radiotelegraphy at all maneuvers and exercises as if they had never heard of radio camouflage, radio deception, or of an intercept service. Most of the radiograms were composed in plain language. Their content was so informative as to remind one of the best periods of the World War; indeed, they sometimes surpassed these. The observation of Italian maneuvers or exercises did offer one difficulty, inasmuch as the distance, the intervening massif of the Alps, and the sharp angles resulting from a short direction finding base resulted in many disadvantages; however, these were compensated for completely by the rich and instructive content of the radiograms which were transmitted with high power. It would be hard to conceive of a more satisfactory opponent for one's own intercept service than the Italian radio service.

The observation of Austrian, Dutch, and Belgian maneuvers was also crowned as a rule with very good success. The problem children of the German intercept service were and continued to be the Poles and the Russians. In the case of the Poles it was possible to achieve certain successes by employing a very large number

of direction finding stations to recognize the movement and the location of the individual radio stations. That in itself was a great deal! For the rest, the Polish air force saw to it by its use of radiotelegraphy that much was revealed regarding the ground forces. In general, however, Polish radio traffic was handled so cleverly that it was only with the greatest difficulty that realtions could be recognized.

With respect to the Russians the situation was still less favorable. Distance alone offered insuperable difficulties. Any mass employment of direction finding station was possible only from East Prussia, and consequently gave such sharp angles that any certain location of the stations was in most cases impossible. The radio procedure used by the Russians was the best in all Europe as far as the camouflage factor was concerned. Their cryptographic systems also proved in most cases incapable of solution. Of course, covering Russian maneuvers always gave a certain amount of information, but this was so slight that it scarcely repaid the time and effort expended.

Aside from the observation of foreign maneuvers there was one other opportunity to get training on a war basis.

In general, people are accustomed to regard the period of time between the First and Second World Wars as a period of peace. In reality during this entire time there was an uninterrupted chain of revolts, revolutions, uprisings, and military actions, with one following on the heels of the other or sometimes running

parallel. In the years 1926 to 1932, for instance, the Italians waged a series of six campaigns in Tripolitania and Cyrenaica, of which one read little in the European papers, to be sure, but which afforded an extremely welcome target for the training of a wartime intercept service.

The six Libyan campaigns were led chiefly by General Graziani, started initially from Tripoli, subdued all Tripolitania down to Gat, and ended later in Cyrenaica with the conquest of the Kufra oases. For this, fast mobile columns were engaged which made very extensive use of radiotelegraphy. The entire traffic of all units engaged in these operations both in communication with one another and with their bases, in communication between Tripoli and Benghazi and between these places and Rome, all instructions emanating from Rome, and almost all orders and reports were handled by radio. That gave a watchful intercept service the chance to follow the course of operations and to recognize on the basis of numerous reports and orders the preparations for further operations long before they began.

The results of monitoring the Italian Libyan campaigns, together with the results of following Italian maneuvers at home, gave reason to assume that in any coming war the monitoring of Italian radio traffic by a foreign intercept service would not fail to give the best possible results.

Things were similar in Spanish Morocco during the revolt of the Riffs under the leadership of Abd el Krim. The Spanish

expeditionary troops maintained a very active radio traffic, both among themselves and also with the garrison stations Ceuta, Tetuan, and Melilla. These last three stations also communicated constantly with Barcelona and Madrid. Almost all the traffic was sent in plain text. Insofar as ciphers were employed, they were extremely primitive and capable of quick solution. Consequently, it was easy in those days for the French, as well as for the Italians and Germans, to get detailed insight into events in Spanish Morocco.

But even the French were not acting very differently in those days. In connection with the uprising in Spanish Morocco, there were other serious native uprisings in French Morocco, in particular in the area of the middle and high Atlas range. On the one hand, the focal points were in the area Ouezzan - Taza - Oudjda, and on the other hand in the area Tafilalet - Ksar es Souk - Ain Sefra. The radio traffic of the larger garrison stations gave so many insights into the course of the entire operation that one could follow events very perfectly from Europe. As in the case of the Italians and the Spanish, the entire handling of military traffic was guided solely by the idea of transmitting the information to the addressee quickly. The factor of disguise retreated entirely into the background. From a tactical point of view this was an error in any case, since even though it might be assumed that the natives in Libya

and Morocco had no radio intercept service, and consequently could draw no advantage from enemy traffic (which is by no means proven), nevertheless, this represented a danger in respect to the training of the signal troops, a danger which was not to be underestimated. The same signal units, which were developing their radio traffic in this manner here, might be engaged at any moment in an entirely different theater of war. There was great danger that they would then operate in the same manner they did here.

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THE INTERCEPT SERVICE OF OTHER EUROPEAN COUNTRIES

Not only had Germany placed great emphasis on its intercept service after World War I and built up a good organization accordingly, other European countries were also busily working in the same direction. However, the methods adopted were vastly different.

On the basis of its previous experience, France had built up a very good organization, the main part of which was merged with the Deuxieme Bureau of the General Staff. This handed out the various work assignments, and here also were to be found the cryptanalytic group and the evaluation center. The technical accomplishment of intercept work was in the hands of communication troops. The organization for intercept service in France differed from that in Germany in that the intercept stations installed in Germany from 1925 on formed themselves into special organizations and were never used for domestic radio traffic, while the French many times entrusted their domestic military radio stations with intercept duties as well. This was a great mistake, for it happened again and again that the radio traffic of these stations showed that they were also engaged in intercept work. For example, they would request certain forms which were only used in intercept service, or they gave information on equipment which also was used only in intercept service, and so on. The knowledge obtained from observing these French radio stations was so far-reaching that in 1931 the German intercept service was very well informed on the French

intercept service, its organization and practical accomplishments. The organization of these intercept stations was very clearly recognized.

While in the French intercept service the focal point was directed toward the observation of radio traffic of foreign armies, the English worked in two different directions, namely, in observation of all radio traffic of all nations in the world, and in complete coverage of the international political (diplomatic) radio traffic. The last-named field was, of course, also cultivated by other countries, but in no country in such a comprehensive and strictly centralized manner as in England. Accordingly, their results in this field were undoubtedly the best in Europe, since the English placed great emphasis on the selection and training of personnel.

The Italian intercept service presented a picture of rather extreme laxity. The Italians had erected a legion of relatively small intercept stations along the French and Austrian borders, and in addition were operating several such stations in southern Italy. The control station with its auxiliary organizations was located in Rome. From a technical standpoint, the Italian intercept stations were well equipped; but their organization and the processing of material was deficient. Also, their cryptanalysis was in quality far behind that of the English, Germans, and French.

In the four military districts of Czechoslovakia, all the larger garrison radio stations were integrated for intercept service. The Czech intercept service operated not at all badly, but it made the same mistake as did the French, by compromising itself through the radio traffic of its own intercept stations. The Czech intercept service was connected with many of the traditions and experiences of the Danube Monarchy, and maintained excellent cooperation with the French intercept service.

Strange to say, the new government of Poland had one of the best organizations. Indeed, I would like to say that this organization was really better than that of the French. Here there was a clear separation between radio service and the interception of foreign radio traffic, so that no compromises could take place by radio transmission. Occasionally officers of the Polish communication service were ordered to France where they participated in intercept training courses. Since France had gathered abundant experience in World War I, this training was extremely advantageous. On the other hand, the Poles themselves had already had opportunity to gather practical experience which was now turned to good account. Poland maintained a still more intensive cooperation with the French intercept service than did Czechoslovakia.

The Russian intercept service had the most obscure organization. That they attached great importance to it, however, was shown by the fact that in all communication formations they had

large contingents for purely military intercept service. How the watching of foreign diplomatic and military radio traffic was carried out as a peace measure is shown only indirectly by the fact that they made use in their own radio traffic of all experience gained from the mistakes made by all other countries. For the rest, it appears that the organization was very simple but for that very reason was more rapid and exact in operation.

The Austrians and Hungarians had also established a very usable intercept organization in their countries. The Hungarians as well as the Germans laid stress on the political side, while the Austrians looked beyond this and directed more attention to the military side of the intercept service. In cryptanalysis the Hungarians were far ahead of the Austrians.

The cooperation of the intercept services of the different European countries presented a fascinating picture. The German intercept service had since 1926 cooperated closely with the Hungarian service - particularly in regard to diplomatic decipherment. The cooperation of the cipher bureau of the Defense Ministry with the cryptanalytic bureau of the Hungarian Honved Ministry was closer and more intensive than that with the Foreign Ministry in Wilhelmstrasse.

Late in 1929 cooperation started haltingly between the Germans and the Austrian intercept service, which was beamed especially toward Italy and Czechoslovakia. About the same time cooperation began between the German and Finnish intercept services, maintaining

a united front against Russia. Since the Finnish intercept service on its part also cooperated with the Polish service, very ticklish situations sometimes arose. The German intercept service also maintained after 1930 a certain amount of cooperation with Lithuania. This was directed against Russia as well as against Poland, but was accompanied by a great deal of mutual suspicion.

Only occasional cooperation existed between the German and Spanish intercept services. It was directed against France and England and was chiefly sponsored by the German naval intercept service. After 1933 collaboration was also brought about between the Italian and the German services, especially in the field of cryptanalysis. There has probably seldom been a cooperation which from its very beginning was marked by such strong mutual suspicion as this. Directions were always given on both sides to exhaust all intercept possibilities of one's partner, but to reveal nothing yourself.

The French maintained good cooperation in intercept work with Poland, Czechoslovakia, Romania, and Yugoslavia, and occasionally also with Switzerland.

The English cooperated with the Norwegian and Danish intercept services, and also in part with Portugal. Essentially they worked only for themselves, which was easy for them since they were in a position to establish intercept stations throughout

the world in their own possessions.

Between Poland and Czechoslovakia as well as between Poland and Romania there also existed a cooperation which sometimes became quite far-reaching. But in all the above-mentioned cases, this never kept the contracting partners of the moment from actively monitoring each others traffic. One of the closest forms of cooperation probably existed later during World War II between Germany and Hungary and between Germany and Italy. And yet these three countries watched each other so closely that a large part of each monitoring organization was burdened with this work.

SOME REMARKS ON THE TECHNIQUE OF THE INTERCEPT SERVICE

If in what follows something is said regarding the technique of the intercept service, then this does not mean the technical apparatus by the aid of which the stations to be observed are monitored, but rather the technique of practical commitment for the monitoring of foreign radio stations and the processing of the material intercepted.

For the observation of fixed radio stations abroad there were in Germany in 1926 six so-called "Fixed Intercept Stations"; one each in

Königsberg in East Prussia,

Frankfurt on the Oder,

Breslau,

Munich,

Stuttgart,

Münster in Westphalia.

The monitoring of foreign stations was generally divided up by countries, thus Stuttgart monitored France, Spain, and North Africa; Munich monitored Italy, Switzerland, Austria, and a part of the Balkans, etc. Along with this, however, for technical reasons those stations which were difficult to hear were assigned to the intercept stations where they could be heard best.

Not quite so easy to solve was the question of monitoring the radio traffic when maneuvers were held abroad. For this purpose,

detachments had to be set up which were pushed forward to the frontier. In this connection, the areas of commitment depended primarily on the area in which the maneuvers to be observed were taking place. Besides this, the following factors had to be considered: reception conditions in the places where the stations were set up; wire connections available for transmission of the observed results; and above all, electromagnetic conditions for employment of direction finders. The locations for the direction finders had to be selected very carefully if the readings were to prove reliable. Furthermore, it was very important, when employing direction finders, to know in which direction the maneuver parties would move. If the maneuver ran off in such fashion that the two parties moved parallel to the direction finding base, then it was relatively simple to keep the radio stations apart and to determine their locations. On the other hand, if the parties to the maneuver moved on a line vertical to the direction finding base, then the resulting angle was generally so acute that an error of 1° in a reading was often enough to cause wrong conclusions. Therefore, it was not at all simple to differentiate the two parties to the maneuver by direction finding. And within the one party matters often lay so that small errors in the reading were enough to give false conceptions regarding the grouping of this party. In such cases it was necessary to choose a relatively broad direction finding base. However, this was limited by the

audibility of the radio stations. The best possibilities resulted when a maneuver occurred in an area which could be surrounded, so to speak, by direction finders. This was usually the case, for example, when observing Polish maneuvers, since here the opponent could be taken in the flank from East Prussia.

Until 1936 a great obstacle to the observation of French maneuvers was the so-called demilitarized zone, in which no organs of the German armed forces were to be employed. From 1928 on, there were camouflaged operations here each year, whereby the units committed were represented as technical surveying detachments of the German Broadcasting Company, of the German postal districts, or of the German Central Post Office. Persons participating wore civilian clothes. So far as I know, complete disguise of the commitment was achieved in all cases; at least, the French never raised any objections through diplomatic channels.

Of the utmost importance was the manner of carrying out evaluation of the intercept results, since the work was so planned as to keep step at all times with the development of the operations so that, for example, the fruits of the day's activities should be available late that evening at the central evaluation office. This called for precise work on the part of the communications service, and for intelligent cooperation by the various branches of the evaluation service. The reports of direction findings were passed every hour by telephone to the evaluation center and were processed there. On a large map the locations and movements

of the radio stations which could be heard were marked by colored pins. Traffic evaluation endeavored to recognize from the relations of the radio stations to one another the framework of the command net of the parties. The cryptanalytic section meanwhile worked feverishly to solve the cryptographic systems employed, and to decipher the radiograms sent. The content evaluation section tried to deduce tactical conclusions from the content of the intercepted dispatches, while the final evaluation section combined the results of all the above-mentioned branches, and endeavored to gain a clear picture of the course of the movements.

We must say that the monitoring of foreign maneuvers by the German intercept service during the period from 1928 to 1939 was attended by great success. The most favorable period lay between 1931 and 1937. Of the 52 maneuvers and large scale exercises covered in this period, the German intercept service achieved a complete reconstruction in 35 cases, a good partial reconstruction in 12 cases, while the results in the remaining cases were still good enough to yield useful information.

THE CHANCES FOR THE INTERCEPT SERVICE

The monitoring of the radio traffic of foreign armies and air forces afforded an excellent opportunity for a comparative estimate of the radio procedures employed in the various countries. Spontaneously the question arose, to what extent the radio traffic of an army would be vulnerable, so to speak, to the enemy intercept service, i.e., to what extent it was likely to afford the enemy information. Around 1936 all the European countries could be divided into three groups, and it is very tempting to compare these groups with one another.

To the first group belonged those countries whose radio traffic gave the most information and which consequently in case of a future war would be likely to offer welcome targets for a hostile intercept service. To this first group belonged Italy, France, Austria, Belgium, and Holland.

To the second group must be assigned those countries where the armed forces worked according to radio procedures which were likewise calculated to offer good information to a watchful intercept service, but by no means to the same degree as the countries in the first category. Here belonged primarily England, Czechoslovakia, and Yugoslavia.

To the third group belonged those countries where special attention was given to the camouflaging and disguising of radio traffic, and where these measures were so far developed that

information of a tactical character could be obtained to only a slight extent. In every one must assign primarily Russia and Poland.

Before defining more precisely the position in respect to the several groups of countries, some remarks may be in order regarding radio procedures in general. The oldest and simplest procedure, which was used especially in World War I and had been retained by the countries mentioned in the first group above, is the so-called circular traffic (Kreisverkehr). Here a certain number of stations communicate with one another on a common wave length, using fixed call signs. The call signs may be changed daily, but are fixed for any one radio station insofar as its call signs remain the same in communication with any other station. This system is very convenient for practical radio communication, and affords a large degree of security for the transmission of the message. However, it has the unmistakable disadvantage that the enemy intercept service very soon recognizes the connections between the radio stations and can easily draw from them deductions as to tactical relations.

Another system is the so-called star traffic (Sternverkehr), where a definite number of stations communicate with a control station. In this system various call signs and wave lengths can occur.

A third method is termed net traffic (Netzverkehr); it is similar to star traffic in its use of wave lengths and call signs, but differs in that the radio stations communicate not

only with a control station but also among themselves. The two last mentioned systems make the work of the enemy intercept service much more difficult because the relations within the command net are not immediately obvious, since in every traffic direction a different call sign and a different wave length will be used; a considerable amount of observed traffic is necessary to be able to reconstruct a tactical or operational command net on the basis of the traffic handled and the direction findings obtained.

It is still more difficult when so-called line traffic (Linienverkehr) is introduced in an army; here only the radio traffic of two stations with one another is recognizable, since for each so-called radio link a particular instrument is employed with its own wave length and its own call sign. If in this case, as happened in Poland and Russia, several call signs are used optionally by one and the same radio link, and if traffic in the two directions is worked on different wave lengths, with daily change of wave length and call sign, then recognition of the relations is possible only if an extraordinarily large number of very dependable direction finding readings is available, or if the type of traffic sent permits some deductions. If neither of these conditions is satisfied or is satisfied only to an inadequate degree, then we no longer get on the evaluation map of the enemy's intercept service a picture of a coherent command net, but simply a large number of individual links totally without connections, and with these nothing can be done.

While it is possible to reconstruct the tactical and operational command net from the traffic of an army working with circular traffic, even when it is not possible to get a single plain text message or to solve quickly the cryptographic system used, it is generally impossible to work out the command net without a knowledge of the content of the messages when line traffic is used.

Of very great importance in disguising radio traffic is the manner of using call signs and wave lengths, or of the system according to which tables of call signs and wave lengths are constructed.

I just used the word "system", and precisely in this there is a trap. If a table of call signs and wave assignments is constructed according to a system (i.e., with a periodic recurrence of the same call signs or wave lengths in a definite rhythm), then the enemy is in a position to recognize this system after a time, to reconstruct the table, and the disguise that was aimed at becomes unavailing. The temptation to work according to a system is very strong, however, since the use of such a table is extremely practical for the operator and for handling a change of call signs and wave lengths. It is possible to change such tables relatively often and without great difficulty. Furthermore, the preparation of such a call sign table is easy. If it is lost in any manner, it can be reconstructed quickly. When using call sign tables which are without system the difficulty lies in the fact that a single table must be

prepared for the entire army in order to avoid repetitions of the same call sign. In spite of its relative simplicity, the production of such a table is very time consuming and must be carried out most conscientiously, if subsequent errors are to be ruled out. If such tables are lost, then the damage cannot be calculated, since the production of new tables always calls for a great deal of work and their introduction entails a whole avalanche of changes in the army. Nor can one keep such tables in stock in any desired quantity.

These technical questions have only been indicated here in a rough way in order to show the significance which the use of a specific radio procedure may have on the disguising of traffic. However, there are still other factors affecting to a large degree the camouflaging of traffic. One of the chief of these is the organization of the communications troops of an army. In this respect the various countries of Europe differed very greatly from one another, and the organization ranged from one that was greatly centralized to one which was entirely decentralized.

France had the centralized type of organization with all communications troops combined into three regiments from which detachments were sent, according to need, to the individual divisions, corps, and armies. On the other hand, there was great decentralization in the Soviet Union where every division, every corps, and every army had its own signal unit. From the standpoint of disguising radio traffic, the decentralized organization is

unquestionably better since it is better suited to take into account the practical needs of radio operation, e.g., no previous "tuning up period" is required. In France, for instance, when large scale maneuvers were held, communications companies were assigned to the divisions committed and these companies had to set up their traffic for these divisions, starting from scratch. Consequently, it was often possible to recognize the radio net in the maneuver area before the maneuvers actually began. In Russia such a thing was impossible. But this phenomenon was not limited to the initial stage of the commitment but in many respects continued on. With centralized organization the signal unit always remained a foreign body within the framework of the unit, while with the decentralized form it was organically fused with the unit.

The above-mentioned criteria and a number of other factors were decisive for the question of the extent to which it would be possible for an intercept service to get insight into the radio traffic of one of the European armies or air forces in case of war. They could not fail to have a decisive influence in any future war.

Within Group I the Italian armed forces undoubtedly took the lead, and there was not the slightest doubt that in any future war the radio traffic of the Italian army and of the Italian air force would give the enemy most valuable information. Not quite so bad, but still very informative, was the situation in France, Austria, Belgium, and Holland. The circular traffic employed here, the frequent transmission of plain text, the use in France of no less than 78 different types of radio apparatus, the use of signal tables - which were very easy to solve - for brief tactical reports, the tendency to be

systematic in the construction of tables of call signs and wave lengths, and many other things, made it certain that in a war between Germany and the countries just mentioned the intercept service would have the best of success in gathering intelligence.

With regard to the countries of Group II the prospects for a foreign intercept service were distinctly less favorable. In England, moreover, the use of short and ultra short waves had been greatly developed, so that it was rather difficult to fix the location of the transmitting stations. Furthermore, England, Czechoslovakia, and Yugoslavia strove to make as little use as possible of radio traffic. It is true that Yugoslavia worked basically according to French methods, but there was a certain timidity about employing radio telegraphy, and this timidity was based on unhappy experiences which Serbia had had in World War I when the Austrians monitored all Serbian traffic and derived the best possible information therefrom.

Russia and Poland were the countries where the disguise of radio traffic had been developed to the greatest possible perfection, at least in the army. From traffic of the airforce of each of these countries it was still possible to get good information; on the other hand, through intensive training and through a modern organization of military operator training, a point had been reached where the military operator, for reasons of the needs of its own command for the transmission of messages and also achieved very good disguise. Long before World War II

it could be recognized that these two countries had learned a great deal from their experiences during World War I and the post-war period; it was certain that in a war with these two countries the intercept service could only count on very modest results.

The preceding remarks force us to recognize not only that the central organization of a well-functioning intercept service cannot merely limit itself to studying and evaluating the radio traffic of a foreign country, but that a very extensive training of the personnel employed in the evaluation staff is necessary. Even in peacetime one must have an absolutely clear picture of the organization, tactics, equipment, and training of foreign communications troops; must know the systems according to which they work; must get practice in reconstructing their tables of call signs and frequencies; and must maintain constant touch with the cryptographic systems put into use. For intercepting and evaluating the radio traffic of a foreign armed force, a large number of aids must be prepared which, in the event of war, will allow the personnel employed to secure the necessary insight within a short time.

In this last-mentioned direction, it happens that in Germany some very good preliminary work had been done by 1936. However, in the train of the rapid rearmament, it was so badly battered by a personnel policy, which in some cases was handled in a downright senseless fashion, that at the outbreak of World War II the German intercept service took the field with the same materials that had been produced between 1930 and 1936. In most cases these could only be regarded as antiquated.

THE "FORSCHUNGSAMT"

It was in the first weeks after the assumption of power by National Socialism that Hermann Goering in Berlin set about realizing a plan which was calculated to give the government and the dominant party such far-reaching insight into the thoughts, feelings, and aspirations of the entire German people as had never been known in all history. Compared with this plan, the informer methods of Metternich and the French Minister of Police, Fouché, had been amateurish experiments.

It was Goering's intention to create an organization which would cover all channels by which an exchange of information or ideas took place within Germany. Furthermore, by intercepting all means of communication of foreign countries which were open to tapping, an opportunity was to be provided for securing extensive information regarding the situation abroad.

This last-mentioned idea had already been realized in two forms, since the interception of the radio traffic of foreign countries and the exploitation of the material thus obtained was being carried on both in the Foreign Office and in the Ministry of Defense in Berlin. These two Ministries were Cabinet Ministries, however, and it was Goering's intention to build up an organization which would service and be bound to the Party on the one hand, and to his own person on the other.

There was therefore no hundred percent confidence in what was being done in the Defense Ministry and in the Foreign Office, and instead of unifying and combining the double organization of the intercept service and thus creating a competent one, Goering decided to let these two offices of the intercept service continue to exist, and to set up a third one alongside them which should be at his personal disposition.

In order to realize this idea, it was necessary to find trained technical personnel; without long deliberation recourse was had to the Cipher Bureau of the Ministry of Defense. Here there was a naval lieutenant, by the name of Schimpf, who had been serving for some years as liaison officer between the naval intercept service and that of the army, and who was a personal friend of Goering and a convinced Party member.

Schimpf had for some years played the role of a silent observer at the Cipher Bureau, and had organized within it a National Socialist Party cell without any word of this having leaked out to the outside world. He had made a few trips abroad, had arranged for collaboration between the German intercept service and that of the Italian armed forces, and had also set up a small illicit German intercept station on a private estate near Barcelona in Spain. This intercept station was working primarily for the navy and had the mission of watching shipping in the Mediterranean. It was also supposed to listen to French radio stations in North Africa and in the southwestern part of France.

In connection with these trips, Schimpf had established contact with Party organizations in Italy and Spain, and had made a great many connections with leading personalities. It was Schimpf who was entrusted by Goering with the formation of the projected surveillance organization. From the officers and civilians in the Cipher Bureau, he immediately selected a group of eight persons, all reliable Party members, who were to be the key men in the new office.

This new office differed, as indicated above, from the corresponding organizations of the Foreign Office and the Ministry of Defense through the fact that the two last-named limited themselves to the interception of foreign radio traffic, and thus were organizations such as were customary in all countries, while the office planned by Goering turned its attention to the interior, and was intended to penetrate all means of communications existing within Germany or leading from here to foreign countries. This meant, therefore, the monitoring of every type of radio connection, of all means of wire communication within the country, and of all wires leading over the frontier; it also meant watching the press, magazines, and all other printed material, the surveillance of letters, and the interception of conversations carried on without the use of wire connections, this latter by installing microphones in particular rooms.

Schimpf and his collaborators went to work about the middle of March 1933. In Berlin, in Behrendstrasse, a building was requisitioned and the central office of the new service was set

up here. It received the cover name "Research Bureau of the German Air Ministry" ("Forschungsamt des Reichsluftfahrtministeriums"), although it had absolutely nothing to do functionally with the Air Ministry, but was directly subordinated to Goering. In between stood the then State Secretary, Koerner.

For listening to all foreign radio traffic (except military) and to illicit transmitters within the country, a system of intercept stations patterned after those of the army was distributed over all Germany. At the headquarters of all postal districts and at all cable junctions so-called postal surveillance posts were established where it was possible either to listen in or to copy. In this way all wires leading out of the country were covered as a matter of principle by switching in, in parallel, a recording device. No telegram of any foreign diplomatic representative in Germany could now get out of the country without a copy going to the Forschungsamt in Berlin. That applied to all enciphered telegrams, as well as to all messages in plain text sent to a foreign address by anyone whomsoever in Germany.

Special value was attached to the interception of the telephone conversations of government officials and of those holding high offices in the state and in the Party service. For this purpose a number of listening posts were created, some large, some small. Gradually an enormous, invisible spy net was spun over all Germany. No officer, no official, no government employee, no Party functionary, and no person of any importance could telephone from now on with any

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assurance that his conversation was not listened to.

Of course, the German public had no suspicion of all this. Even high and very high offices in the state knew nothing about the Forschungsamt, or had only very nebulous conceptions of this agency. Furthermore, the cover name "Research Office of the Air Ministry" had been so well chosen that anyone would have been led to believe it to be a purely technical agency.

The Forschungsamt paid special attention to the Ministry of Defense and to the commands of the military districts. Here most of the telephone conversations carried on by higher officers were listened to; moreover, there was established a system of "confidential agents" whose duty it was to gather information and pass it to the Forschungsamt.

The surveillance of general delivery letters formed a large part of the work of the Forschungsamt.

The house in Behrendstrasse was only intended as a provisional and temporary solution of the housing problem. While they began organizing the new task in this location, a former hotel, "am Knie", in Charlottenburg was remodeled for the purposes of this agency. The technical organization of the "Haus am Knie" was carried out according to the most modern principles. Postal pneumatic tubes, teletype installations, soundproof rooms, listening centers, switching devices, etc., came into being here which were installed on the basis of all previous experience in the field of interception. Toward the end of 1933 the agency moved into this house.

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In² the meantime, the personnel and materiel of the cryptanalytic section and the evaluation center had been increased and their work had been begun late in the summer of 1933.

At the outset, the Forschungsamt tried to work in conjunction with the Cipher Bureau of the Ministry of Defense and with Bureau C of the Foreign Office, but soon met with a cold shoulder since the Forschungsamt intended as a matter of principle always to be the recipient and never the giver. It was only a short time before there was an open break, and the cooperation continued only in a purely formal way, with each party endeavoring not to let the other gain any insight into its own work.

In the first phase of the work of the Forschungsamt, a number of special objectives arose on which work began. One of the most essential was the surveillance of the Officer Corps of the Ministry of Defense and of the armed forces in general. The second target comprised the high leaders of the NSDAP and their formations, since it was believed that one could not absolutely rely on the loyalty of these men. The third target was the Catholic Church with all its institutions and the surveillance of the communications of the Vatican with Catholic organizations or personalities within Germany. In this activity they found at that time traces of various money transactions of Catholic monasteries, and the flood of so-called foreign exchange suits and other measures directed against the Catholic monasteries had its origin in the activity of the Forschungsamt. The fourth

target was the German People in general, and particularly all persons who had formerly been active in political life, in trade union movements, in labor organizations, and the like. There was close collaboration with the Gestapo.

In creating the Forschungsamt, Goering had intended to use this instrument exclusively for his own purposes. However, the nature of the work soon brought it about that Himmler attempted on his own initiative to gain an influence over the Forschungsamt and its activity. This soon led to a rivalry between the two men which at times took on a serious character. In time Himmler succeeded, however, in getting a stronger and stronger influence, so that gradually power in respect to the Forschungsamt passed from Goering to Himmler.

The first great "justification" of its work was achieved by the Forschungsamt in connection with the Roehm affair. Roehm and his adherents, as well as the group in the Ministry of Defense which was opposed to National Socialism, had been watched constantly since the end of 1933. Every telephone conversation of these people, every letter written by them, and every other utterance was recorded; in time, a veritable mountain of material could be gathered in this way in the evaluation center of the Forschungsamt. In the case of many of these men, there had been installed in their private rooms microphones which were concealed in regular telephones, table lamps, chandeliers, electric clocks, etc. It was at that time that the first serious contact with Himmler resulted; he used the work of the Forschungsamt,

in conjunction with Goering, to eliminate troublesome opponents. The evaluated material was cleverly pieced together and laid before Hitler, who then instituted that celebrated blood purge of 30 June. In the train of this action fell General von Schleicher, General von Bredow (former Chief of the Defense Section), and other officers. Schimpf, who had meanwhile become a councilor of ministerial rank (Ministerialrat), secured for himself by this action a position of great power but also a number of enemies who had to be taken seriously.

To that period belongs also the attempt on the life of the student, Bell, in Kufstein, which was organized on the basis of information from the Forschungsamt; the action against Professor Lessing in Karlsbad and the kidnapping of Jakob Salomon were also due to the activity of the Forschungsamt.

In mid-April 1935 the following occurred: Ministerial Councilor Schimpf, who until then could almost always be reached by telephone, had suddenly "gone away for an indefinite period," and the information one could get was put so strangely that it was impossible to keep from feeling that something or other was wrong at the Forschungsamt. Soon rumors began to circulate, and one day it came out: Schimpf was dead.

The first version was an auto accident; the strange thing about that was that the statements regarding the place where the accident was supposed to have occurred differed widely. First it happened in Silesia, then in Berlin, then in Königsberg. Soon

afterward it was learned that Schimpf had committed suicide. However, the case was the same as with the auto accident. At least a dozen hotels in Breslau, Königsberg, and Berlin and environs were named, in which the tragedy was supposed to have occurred. One story was that he shot himself; the second story was that he killed himself along with a lady friend, but even here there were so many variants that it was immediately obvious that the spreading of these rumors was only intended to veil the truth.

In its propaganda activity National Socialism always made the mistake of working too clumsily. It did not satisfy these people to work out a version of a story and then spread it consistently, instead they always tried to spread a haze, and to cause confusion by a whole collection of different stories. Thus it was with the burning of the Reichstag; thus it was on countless other occasions; thus it was later on in the Hess case; and so it was in the case of Schimpf. But the very clumsiness which underlay this propaganda generally resulted in letting people get on the right track fairly soon. It was not long before the following facts were known:

For his eavesdropping on the Ministry of Defense Schimpf had smuggled a number of confidential agents into the bureaus of this ministry or had recruited persons there for his work. In March 1935 one of these agents had extracted an exceedingly important document from a safe in order to turn it over to the Forschungsamt for a short time for inspection. As chance would

have it, this document, along with several others, was needed a few days before Easter; they looked for it and could not find it. An investigation, which was started immediately, cleared up the affair, and it was reported to the then Minister of Defense, von Blomberg. Blomberg, who was already in opposition to Goering and Schimpf, was extremely perturbed and used the occasion to make before Hitler a violent attack on the Forschungsamt. The matter ended with Hitler's dropping and disavowing Schimpf.

On the day after Goering's departure on his wedding journey, Schimpf was found in Gruenewald not far from Potsdam with a bullet hole in his head.

There can be no doubt that Schimpf did not commit suicide but was put out of the way by the Gestapo as one who knew too many secrets. Schimpf was a happy fellow who was extremely fond of life, and who would never have taken a moral reprimand as an occasion for leaving this world. But Schimpf had become not only unbearable but downright dangerous to Goering and Himmler, and he had to disappear.

Goering prepared for him a great cremation ceremony at the crematory in Wilmersdorf, and sent a gigantic wreath of laurel with ribbons bearing the inscription: "To My Faithful Collaborator Hans Schimpf 1st Gratitude Hermann Goering." State Secretary Milch delivered an address. Then followed a salute of honor. The "Voelkische Beobachter" carried an article glorifying the "untiring old fighter of the National Socialist Movement and faithful collaborator in the building of the Third Reich."

The Ministry of Defense sent no representative to the cremation ceremony; Schimpf's former comrades were forbidden to participate.

The work of the Forschungsamt found its second justification in connection with the Tukhachevski case, concerning which we shall speak at a later opportunity. In this action the leading role was in the hands of the Forschungsamt, where, as successor to Schimpf, Prince Christoph of Hesse had been appointed chief.

The Forschungsamt had a third opportunity to prove the "worth" of its work in a big way when late in 1938 the great housecleaning was undertaken in the then Ministry of War. Von Blomberg, Baron von Fritsch, and a number of other officers of high and very high rank had to exit the field. This was Goering's revenge, and the revenge of the Forschungsamt for the Schimpf case.

After what has been said, no one will be surprised to hear that this agency was also carrying on Ribbentrop's Foreign Office in Berlin by the use of microphones it had installed. Hardly anyone will be astonished to hear that the installation of these microphones was undertaken over a period of weeks in the calmest fashion by men of confidence to the Forschungsamt, without a single official in the Ministry having noticed anything.

The work of the Forschungsamt played a very important role in penetrating the entire inner structure of the government in Austria before the German occupation. For this task a special

subsection was formed, and from here the penetration of the entire communications system of Austria was accomplished by the Forschungsamt. They had an easy time since a large part of Austrian officialdom proved quite ready to aid in this respect. For instance, all telephone conversations carried on within the ministries, the content of all telegrams sent to representatives abroad, and the content of many important documents were channeled to the Forschungsamt. They even went so far as to betray to the agents of the Forschungsamt practically all the cryptographic systems used by the Foreign Office in Vienna, by the Austrian armed forces, and by the Austrian police. The Austrian telephone and telegraph cables leading through the Berchtesgaden area were tapped by representatives of the Forschungsamt.

During the war there were countless opportunities for significant work on the part of this agency. To detail all these here would lead us too far afield. We shall only mention that the frustration of the action of 20 July 1944 and the disclosure of those participating in the conspiracy was due in large part to the surveillance activity of the Forschungsamt. At that time Himmler had already fought his way through to a victory over Goering, and the work of the Forschungsamt was directed according to his wishes; it was by no means an accident that Himmler was not present at the two conferences in the "Fuehrerhauptquartier" during which the

attempt on Hitler's life was to be and was carried out. After 20 July 1944 Himmler was the undisputed master, even in respect to the work of the Forschungsamt.

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232

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THE FORMIS CASE

The SA-Man, Formis, had faithfully and studiously done his duty in his native Württemberg during the so-called "period of struggle." He had marched, had sung, and had diligently drunk beer on Party evenings. You could tell that by looking at him. for his girth had increased so that when he took a bath he only had to fill the tub one-eighth full of water; if he then laid himself down in it, it was sure to be full.

Along with his liking for SA evenings, he had from youth up had another love, which was tinkering with the radio. And this he did with devotion and skill. Therefore his comrades and superiors in the SA considered him a radio expert. That led to his getting a job with the Stuttgart broadcasting station after the "assumption of power," and, to be sure, as announcer. And this office he likewise administrated henceforth with the requisite diligence.

Up to that point his career revealed nothing extraordinary and it might have remained so for the rest of his life, if serious injustice had not been done him by the Party and the SA in the year 1934. It does not matter to us what this injustice was; nor does it signify who was responsible for this injustice; it is certain in any event that Formis had been calumniated in base fashion and felt deeply aggrieved - despite his usual cheerfulness and optimism. The spectacles of optimism

and faith through which he had hitherto regarded everything that went on within the NSDAP and its formations has been shattered, and he now began to regard very critically what had hitherto been considered by him as an untouchable sanctuary. It was not long before Formis had a nose full - as the saying goes, so full that he thought he could no longer stand the stench of the new era in Germany, and betook himself to Czechoslovakia where he attached himself to the oppositional Strasser group or the "Strasser Movement."

Here in Czechoslovakia a so-called "Black Front" had been formed which was waging a bitter but hopeless struggle against the Hitler regime in Germany. Formis with his knowledge and ideas came very opportunely for these people. With his aid they thought of setting up a propaganda broadcasting station in order to carry their own ideas and their agitation against Hitler and his system across the border to Germany.

So Formis went to work and within a short time constructed a shortwave transmitter for telephony, which was so small it could have been carried in a small handbag. He rented a room in a tavern in the vicinity of Prague and installed his radio station very skillfully in the upholstery of a big armchair, so that outwardly nothing could be seen of the entire apparatus.

After these technical preparations had been completed Formis was supplied twice a day by the information section of the "Black Front" with news which seemed suitable for propaganda work in Germany.

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Formis himself saw to the transmission, and served as announcer.

The transmitter was very soon heard in Germany and it was astonishing to see how many listeners this first anti-Hitler German broadcaster found within a very short time. People were whispering to one another: "Have you heard? Wave 31 m! Evenings at six and mornings at ten! Very interesting! But, psst! Don't betray anything!"

And so they listened with pleasure to the new transmitter of the "Black Front." They really enjoyed hearing a voice at last which ventured to speak against this new regime of force which suppressed all criticism.

Compared with present day standards, the transmissions of Formis were not brilliant performances. At that time no one had any experience in this field. But at that time, in 1935, they were a sensation and a dangerous one.

The intercept stations of the army and of the police, in conjunction with the organs of the Forschungsamt, monitored the new sender for the purpose of ascertaining its location and of picking it up if possible. But this was more easily said than done. Getting bearings on shortwave transmitters was still in its infancy in those days. They got the most varied directions and for a time were of the opinion that the transmitter was located in Hamburg. Other readings pointed to England or southern Germany. A good many of the readings did point to Czechoslovakia, and to be sure, to the general area of Prague.

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In his broadcasts Formis tried to give the impression that he was in German territory. "We are standing here at the microphone," he said once, "and beside us are 600 pounds of dynamite. If those black dogs come (he meant the SS), they will be blown up along with us." Another time he said: "We here in Germany... ." or: "When we look out of the window and see those brown rascals passing by... ."

A few times he did make a slip and used expressions which gave the impression that he was outside the boundaries of the country. Only one never knew whether this was done intentionally to mislead.

The newscasts of Formis testified to the fact that there must be a smoothly functioning, fairly sizeable information organization behind him. He was always very well informed on all happenings within the Party and the government and its organs. The general tendency was toward an overthrow of the Party government and the abolition of the entire system. "Brown is the..., and Hitler is leading us to... ."

After some months of observation the Forschungsamt had ascertained by direction finding the approximate location of the transmitter. The exact location could not be determined, however. An accident helped them get on its trail.

Hitherto, no one had any idea who the announcer might be. However, Formis had a characteristic manner of speaking, and in the Forschungsamt, whose intercept stations were monitoring this transmitter, there was an official who had formerly been well acquainted with Formis. He listened to the transmitter several

times and came to the conclusion that the speaker could be none other than Formis. Now a Gestapo man was sent out into the region where the transmitter must be located. After a few days he had gotten on the trail of Formis.

Now the Gestapo was determined to pick up the station. But that was not so easy, because it was located in Czechoslovakia, that is to say, in an independent country where the Gestapo had no possibility of making a raid. It was impossible to count on any cooperation by the Czech police.

Since there was no way of taking action in "legal" fashion, they resolved on an illegal act of violence. They inquired carefully about Formis' habits. An official of the Gestapo took a room in the same tavern and watched the man. After they had gotten sufficient clarity, an auto with two other specially selected Gestapo agents was sent out to the place where the transmitter was located. The action was carefully prepared in every detail. Formis was to be over-powered and brought to German territory.

At the appointed hour, at six o'clock in the evening, i.e., at transmission time, the auto arrived in front of the inn. All three Gestapo agents rushed into the house and into the room. Formis attempted to defend himself and then tried to escape through a window but was shot during the melee. The Gestapo men now climbed into their car again and sped away to the frontier.

The occurrence became known instantly and all Czech border stations were instructed by telephone to stop the car with the

perpetrators. This was done. The German Government, however, immediately intervened with all possible pressure and the Czech Government, which did not desire any serious incident, gave instructions to let the three men go.

This encroachment by the Gestapo caused great agitation in Czechoslovakia. In Germany there were many people who continued for a long time a fruitless search on their radio dial for the transmitter of the "Black Front" until they finally became convinced that all their efforts were in vain.

THE THILO CASE

It is certainly not an everyday occurrence that a man has the given name Thilo. But in the present case not only should the name of the man be classed as a rarity but the whole affair can lay claim to being rather unique.

One day in the spring of 1926 a man was engaged at the Cipher Bureau of the Ministry of Defense who had the given name Thilo, and who was the brother of a major in the General Staff who was then functioning in the Ministry of Defense. Later on this Major occupied a very high position of command in the armed forces and for that reason the name will not be mentioned in this connection. It is enough if we speak henceforth of the "Thilo case."

Thilo was then, as already mentioned, employed in the Cipher Bureau and, to be exact, in that section in which cryptographic systems intended for use within the armed forces were compiled, reproduced, and distributed. Thilo had been a first lieutenant in World War I, had then married, and had had a soap factory and bone yard in the vicinity of Berlin. His business had gotten into difficulties during the economic crisis; Thilo had been compelled to close the doors of his factory, and had sought the help of his brother in getting a position.

As it soon turned out, Thilo was not one of those people who are in the habit of working over hard. Even his external.

appearance suggested that he was one who could take things easy, but in his work this was even more so. At least, that was the impression he made. In the morning he was the last to report for work, at noon the first to disappear for his meal; and approximately every second or third afternoon he had "something to do outside." In this manner he continued to work within the Cipher Bureau, without doing much, without making himself a burden to his colleagues, or displaying any ambitious tendencies. Very often he traveled as courier to the commands of the military districts, in order to bring the new ciphers to the appropriate parties when systems were changed. He supervised the printing of new keys and the recall and destruction of systems retired from use.

He did this sort of work until 1934. During that time certain mishaps occurred, due to Thilo's carelessness and as a consequence of his pronounced laziness; it was therefore decided to transfer Thilo to another section of the Cipher Bureau. The cryptanalytic section declined to receive him into its ranks; finally he landed in "evaluation" and, since he had some knowledge of the English language, was set up as a specialist in the English subsection.

Since Thilo had stood on an excellent footing with all his previous colleagues, he continued to maintain contact with the section for German cryptographic systems and still journeyed now and then to the commands of the military districts as courier. He also endeavored to continue his old style of work in the new section.

Of course that could not well go on in the long run, since the assignment was constantly growing and, in order to master the material, it was necessary to familiarize oneself with many questions concerning the British armed forces. However, neither kindly persuasion nor serious admonitions could move Thilo to familiarize himself more intensively with his field, and the end of the matter was that in 1936 he was dismissed from the service of the Cipher Bureau. It was all the easier to clear up the situation, since Thilo had expressed the intention of quitting the service anyway and of reopening his factory, since he had succeeded in getting together a considerable amount of money which would enable him, in the new economic situation, to get his enterprise going with some prospect of success.

So Thilo left the Cipher Bureau and began grinding bones and making soap. But the business did not last long, and one day Thilo faced the problem of having to look around for a new job. At the Ministry of Defense the doors were closed to him; accordingly he applied to the Forschungsamt, especially since he could prove that he was a good old member of the Party. In the fall of 1937 Thilo was engaged at the Forschungsamt and took up his work.

Two years later the Second World War broke out. Poland was subdued. In the summer of 1940 France was conquered and occupied, and at one of the railway stations in Paris the German troops captured a freight train filled with documents

from the French Ministry of War and the Foreign Office which was supposed to have left for the south of France. The documents were taken to Germany where they began to sift and arrange them. Naturally this was done with characteristic German thoroughness, i.e., slowly. First of all lists and tables of contents were prepared and so a considerable time went by, before anyone found out in detail what had been acquired.

By the end of 1941 they had progressed so far as to ascertain that they had captured here a large number of documents from the French secret service. Now they set about a systematic evaluation of these documents and early in 1942 amid the mountains of papers they found a neatly arranged list -- provided with all details and giving the appearance of an almost Prussian thoroughness -- of those confidential agents who had been working for French intelligence in Germany. And lo, among other well-known names they found that of Mr. Thilo. But whereas in the case of the other confidential agents it was generally a matter of so-called small fry, since they had been paid off with relatively small amounts, there were very different sums entered in Thilo's account, which led one to infer that he had really been providing something. The last amount which had been paid out to him was the cool round sum of 100,000 German marks.

Now it is an open secret that the espionage service does not usually act very handsomely in paying agents. When sums of this magnitude were paid, only information could be involved which was of especially great value to a foreign power.

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Now they began to follow up the affair and learned that our friend Thilo during the entire period of his activity in the Ministry of Defense had currently betrayed to the French liaison man in Berlin all the cryptographic systems then used in the German army. Moreover, cryptographic systems, tables of call signs, details regarding the German cipher machines - all of which were intended for use in case of war - had traveled the same route. In the field of evaluation he had become more adept than anyone had suspected, since it was with the real understanding of an expert that he had brought to the knowledge of the French secret service all details respecting the organization of the German intercept service, regarding the systems of evaluation and their applicability, regarding the methods of German commitment for the observation of foreign maneuvers by the intercept service. Both the betrayal of the cryptographic systems and that of the call sign tables could not have failed to put the enemy intercept service into a position where it would be able to read all German radio traffic without difficulty. This was of inestimable value for the French; the betrayal of the assignment of the German intercept service likewise revealed to them the weaknesses of their own radio organization and showed them to what extent it was possible to penetrate into the secrets of their means of communication.

Thilo had, moreover, supplied the French with lists of those persons who might be considered as really competent and capable evaluators on the German side; from this it was possible to see that their number was exceedingly small.

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Aside from the things already mentioned, Thilo had supplied the French with many other bits of information, which he had been able to secure easily since he was a familiar figure in the Ministry of Defense and the name of his brother opened doors for him anyway. During the period of his activity in the Forschungsamt, he had brought to the knowledge of the French the entire organization of that agency and a good many details regarding its work.

In view of the cooperation between the French and English intelligence service, it was self-evident that the English were also informed of at least a part of these deliveries of Thilo.

Thilo was arrested and his hearing revealed so many things that the interrogators never ceased to shake their heads. Before the case reached the courts, Thilo committed suicide in his cell.

Whether Thilo was working only for the French secret service or whether he had other connections will probably never come to light. The French at all events were not able to profit much from his work since the war sped across the country too swiftly. It is to be assumed; however, that the English were able to make use of much that Thilo had supplied to France.

It is interesting to note in this connection that the "Thilo Case" had a "side line" which was not without its humorous aspect. The counter-intelligence section of the Ministry for Defense had gotten on the trail of the work of a French agent in Berlin in 1930. They decided to play fake material into the hands of this man. For this purpose a sergeant F. was selected to act as middleman.

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F. was employed in the Ministry of Defense as clerk and draftsman in the Cipher Bureau. He was now put in touch with the French agent, had to meet him now and then, and had to turn over documents or photographic copies thereof, which had been falsified or faked in the counterintelligence section. That went along for a while quite according to plan. But Thilo was very well acquainted with this sergeant F. ; they even worked for a time in the same subsection. In a clever manner, Thilo succeeded in transforming F. from a "fake" supplier into a "genuine" purveyor. From now on he betrayed to the French agent what was falsified, so that the French secret service was informed regarding the deception. The game continued for years. From the papers captured in Paris in the above mentioned train the double role of Sergeant F. was likewise revealed.

Thilo's treason gave the French intercept service an unheard of opportunity, for it made it possible to read all German military radio traffic over a long period. It gave the French at the outbreak of the war possibilities of a reconnaissance service in the ether which could not fail to have great consequences. Strangely enough, the French did not make full use of this chance. We get the impression that, relying on the memory of the decisive role of the French intercept service in 1914 and in the reassuring knowledge that they were in possession of the German ciphers and call sign tables, they neglected to do many things which they necessarily should have done, in view of the German superiority in personnel and materiel.

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THE DEVELOPMENT OF THE GERMAN INTERCEPT SERVICE AND
OF ITS CONTROL STATION AFTER JANUARY 1933

At the end of 1932 the control station of the German intercept service had reached a state in its organization and personnel which enabled it to direct the peacetime work of the intercept service rather well and to process the results. Immediately after the "assumption of power" by National Socialism in Germany, a development set in at the Cipher Bureau which gives the impression of being an advance, but in reality signified a retrogression.

This development moved in two directions; on the one hand, in regard to the personnel situation; on the other, in regard to the general organization. In the train of the rearmament which now began, people were constantly brought in who had not the slightest qualification for the intercept service. Their only merit was that they had been officers in World War I and wished now to reenter the German armed forces, which were being expanded. They were all officers who had served during the World War in the Signal Corps, but whose outlook was never broader than that of a company commander.

First they were brought in as civilians; then they got the designation "L-Officers"; and finally they became the so-called "E-Officers". They usually got credit for a good many years of service, and in consequence in many cases obtained a rank higher than that of the experts who had been in the service up

to that time. This immediately brought a factor of friction into the whole situation, and since the newcomers were often installed as section heads, after a short period during which they were to familiarize themselves with the work, while the previous section heads were subordinated to them. the joy of the old personnel in the work declined rapidly, especially as the new masters generally acted in a very presumptuous fashion.

In many cases gentlemen were engaged who turned out later to be very questionable characters. Thus, for example, in 1934 the Organization and Assignment Section of the Cipher Bureau was turned over to a new man who, up to then, had been selling typewriters, who had not the slightest idea of the technique and tactics of the intercept service, and who finally had to be condemned on account of various shady dealings. On the basis of documents captured in Warsaw after the occupation of Poland in 1939 another of these new gentlemen turned out to have been a former agent of the Polish secret service. In the meantime he had risen to the rank of major in the German armed forces!

Naturally, not all the newly assigned gentlemen were in this category; however, they were in most instances - looked at objectively - wholly unsuited and only had a desire to advance as quickly as possible and make a good career for themselves. Any feeling for careful scientific work was completely lacking on their part.

Any permeation of such sensitive organizations as the evaluation and the cryptanalytic groups by elements of this sort naturally could not fail to cause serious harm. This was manifested in the case of the evaluation group, for instance, in the fact that henceforth there were more maneuvers covered and more official journeys made, while the results were far inferior to those of the earlier years.

In respect to the organization of the intercept service, the measures which were now put through were likewise such as to cause serious concern. The creation of the Forschungsamt, concerning which we have reported, withdrew from the control station of the German intercept service a considerable number of good men without any corresponding reduction in the assignment. For, although it had been stated originally that the monitoring of all diplomatic radio traffic would now be taken away from the Cipher Bureau of the Ministry of Defense, there was actually no change in the picture.

A little later some members of the Cipher Bureau wandered off to the Ministry of Propaganda. Moreover, the newly created Air Ministry now set up an intercept service of its own, and again drew away a certain percentage of the old, trained personnel of the Cipher Bureau. In this case, too, there was no change in the assignment of the Cipher Bureau, since it had to continue to monitor the radio traffic of foreign air forces.

just as before, because there was no possibility, either in intercept technique or in methods of evaluation, of separating the monitoring of traffic of foreign armies from that of foreign air forces.

A little while before the outbreak of World War II, the control station of the German intercept service was again split up, this time by assigning one half to the High Command of the Army while the other half was left with the High Command of the Armed Forces. Instead of creating one great, competent, central intercept organization, one was thus breaking up the little old organization more and more from year to year, and was filling out the gaps by engaging unsuitable personnel. At the outbreak of World War II there were intercept organizations in Germany with the High Command of the Armed Forces, with the High Command of the Army, with the High Command of the Air Force, with the High Command of the Navy, with the Forschungsamt, with the Security Service, with the Ministry of the Interior, with the Police, with the Ministry for Propaganda, with the Foreign Office, and with a whole string of other agencies and offices. Only in very rare instances could one speak of any sensible cooperation among them. In general, they worked at best side by side with an enormous amount of superfluous and avoidable duplication.

The same dissipation of energy was also found within the Cipher Bureau, which was supposed to be the control point for the entire intercept service of the armed forces, but which in reality had not the slightest authority to impose its wishes on the intercept

services of the three branches of the armed services. The old organization, which had been tested and proved adequate, was loosened more and more, and new subsections were constantly being created to set apart an appropriate independent sphere of activity for gentlemen who were newly hired. All those areas, which had hitherto been intermeshed, were now separated from one another and each went its own way.

In the middle of 1939 the personnel strength in all branches of the German intercept service was 18 times the number employed in 1932, but there was not even a remotely corresponding increase in tangible, useful results.

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THE "INTERCEPT COMPANIES"

The six fixed intercept stations which existed in Germany in 1932 for monitoring foreign radio communications were even then scarcely sufficient for carrying out the most necessary tasks. It was inconceivable that they would be in a position to cope with the enormously expanding requirements in the case of war. Even in peacetime the observation of maneuvers could only be carried out if the fixed intercept stations detached troops and sent them forward to the border. However, this always entailed a temporary neglect of other assignments. A new way had to be found of creating mobile formations which could be employed in case of need (primarily in war) wherever this might prove necessary. They had to exist in time of peace and become thoroughly familiar with the prospective opponent.

For these reasons it was decided to set up an intercept company, to which a second was soon added. In and of itself the idea was doubtlessly good, since a motorized unit which was kept constantly in practice and was trained to monitor the army radio traffic of a specific opponent, could achieve good results at once, if things became serious.

The practical carrying out of the training of these intercept companies, however, went against all reason. Instead of occupying these formations constantly with the monitoring of foreign radio traffic, they were only rarely employed in monitoring foreign exercises to give them "practice"; in the main they were

used to intercept and follow the radio traffic of German units carrying out exercises. Now the way the German army radio traffic was handled was not comparable with the method of any of the other armies of Europe. The "practical work" of the assignment and of its evaluation resulted, therefore, in a distorted picture and was utterly senseless. Of course, under these circumstances it was possible to get practice in fixing a radio station and determining its geographic position; but one could not learn the characteristics and peculiarities of the traffic which would have to be monitored in case of war. The intercept companies, on the other hand, were more interested in listening to their own traffic than to foreign traffic because the characteristics of their own traffic were known to each of the men in all details, so that the work was easy. Moreover, the personal contacts often made it possible to find out a great deal about "the other side" over a glass of beer; this was of value for the intercept company involved.

So it was no wonder that these companies, which were later increased to six, fell down in the monitoring of foreign maneuvers. This forced people to recognize that these companies would not, in case of war, be in a position to supply useful intelligence, until they had had a month of training under war conditions, assuming, of course, that they were assigned well qualified evaluators to work over the results of their monitoring. Precisely in this regard, however, very little was done.

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If we consider this development from the standpoint of a factual testing of its value, we are forced to the conclusion that the intercept companies under these circumstances would cause more harm than good in the event of war, since the intercept service is a two-edged sword. If it works precisely and with scientific accuracy, then it can be of great use to its own command. If it does not do this, and if the work in such a complicated field is carried on by inadequately trained people, then the results may cause the command to make fateful errors in judgement.

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THE LITERATURE ON THE INTERCEPT SERVICE

The interception of technical means of communication had its beginning in World War I and was developed into a significant military instrument. The number of battle actions, operations, plans, and diplomatic measures which were based on the results of actual intercepts became very great.

That one was silent about this during World War I seems self-evident. By way of limitation, I must remark that even then some things trickled through to the general public, but were not given much attention. For instance, a few weeks after the battle of Tannenberg a Berlin paper carried an article in which attention was called to the fact that Russian radio traffic made it possible for the German command to carry through the operations in the way it did. Two years later a Frankfurt paper carried a similar article which had reference to the results of the intercept service in the west. The article in the Berlin sheet gave the Russians a warning and resulted in their paying more attention in the future to the security of their radio messages. The article in the Frankfurt paper also turned out to be very incautious and unfortunate.

When World War I came to an end, literature on this war began to appear slowly in public. The various generals expressed their opinions regarding the operations they had conducted or regarding the war in general, and here and there offered very interesting details on the practical application of the intercept service.

This question was treated in a far more detailed fashion by General Max Ronge, in his book "Military and Industrial Espionage," in which he gave a large number of examples from the actual work of the Austrian intercept service. So far as I know, this book remains the only one which occupied itself with this theme to any great extent. The other things which appeared on the subject were either relatively short treatises on single topics or official memoirs, sometimes there were rather brief articles in newspapers and magazines.

Among the treatises on individual topics was a brochure by the well-known Austrian cryptanalyst, Figl, under the title "Systems of Decipherment." The French colonel, Givierge, expressed himself on the same theme. The then American ambassador in London (Page) expressed himself on the subject of the Zimmerman telegrams in his book of war memoirs. Regarding the battle of Tannenberg, an article appeared first in Sweden. To sum it all up, during the entire period between the First and Second World Wars only three men - so far as I know - expressed themselves in brief form on this theme. These were Colonel Calvel in France, Colonel Szieszynski in Poland, and Major Vasiliu in Romania.

Calvel's memoir was intended as a textbook for the French communication service. It did contain a number of very interesting examples from the period of World War I, but the chief stress was on technical questions, on what had been learned by experience,

and on directives for the security of one's own communications against hostile interception.

The Pole, Colonel Szieszynski, was a pupil of Galvel and on his return from Versailles composed a memoir which included all the examples which had become known to him in France, as well as additional noteworthy examples from the period of the Polish-Russian war. Szieszynski's memoir, which appeared under the title "Interception and Direction Finding Service as a Source of Intelligence Regarding the Enemy," contained many exciting examples from the past. This little volume - like Galvel's brochure - was not published but was intended only for instruction within the Polish communications service.

The Romanian, Major Vasiliu, had attended the courses in France along with Szieszynski, and had likewise brought home a number of things which he had heard and seen there. In the same way as Szieszynski, he composed a memoir in which he stressed primarily events in the Balkans and gave at great length directives for carrying on a methodical intercept service.

In Germany they tried to permit as little as possible to appear in public on this theme. After 1933 there was even a decree forbidding anyone to touch on such matters in the press.

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THE ARMAMENT OF EUROPE AFTER 1933
AS REVEALED BY THE INTERCEPT SERVICE

It would be a great mistake to assume that the rearmament of Germany did not begin until the autumn of 1933 after Germany left the League of Nations. It would be also wrong to believe that in the preceding two years there had merely been a certain amount of preparation for rearmament. With respect to the preparation for the production of weapons and of technical equipment, the beginnings of rearmament in Germany reached back into the first years after the end of the First World War. However, people abroad noticed virtually nothing of this. Even within the country nothing was known about it outside a small informed circle.

The early stages of this effort became visible early in 1929. At this time a remarkable development began both among the various staffs and also in the Ministry of Defense. Everywhere so-called "employees" or "civilian employees" appeared, who were employed at first in simple tasks, but then in more and more important ones. These were all former officers. They were engaged as "spectators" or "assistants" at drills and maneuvers, and attached great importance to being addressed by their former title. A series of new subsections was set up in the Ministry of Defense and in the seven military districts.

If one engaged one of these men in intimate conversation, one soon got some insight into their trend of thought. At first they expressed their satisfaction at having escaped from the inferior status of an agent or traveling salesman and once more at finding employment suitable to their station. Soon they would admit that things were moving toward rearmament and that their present occupation as employees was merely an intermediate stage.

If one observed the entire radio traffic of other European countries, it could be recognized that in all countries, without exception, military armament had reached a certain standstill. To be sure, organizational changes were made here and there, or antiquated weapons were replaced by new ones; even the training regulations were revised now and then. But there was virtually no real change in effective strength and in respect to the training and preparation of reserves, or with respect to the quantity of arms available.

In 1932, and indeed early in this year, German propaganda for the creation of a 300,000 man army took shape openly. In reality the effective strength of the German armed forces had already expanded far beyond the 100,000 man limit set. If one counted in the numerous "employees" and assumed that they were to serve as a skeleton for a new officer corps, one reached the conclusion that all that was necessary was the induction of a corresponding number of recruits, whereupon the entire 300,000 man army would be complete. The arms, tools, and equipment had

long since been at hand.

The monitoring of military, diplomatic, and internal radio traffic of all the European countries, which in general gave very good and sometimes very extensive information, did not afford the slightest proof that at that time there was any building up of armaments abroad, not even in the spring of 1932 when a flood of placards and postcards poured out all over Germany showing in graphic form how defenseless and unprotected Germany was against any hostile attack and what the military strength ratio of all adjacent countries to Germany was. These postcards, which were produced in many variations, were sent out through Germany by the millions. Corresponding large placards could be seen in every government office, in every station, and in the corridors of all public buildings. There was not the slightest doubt that this wave of propaganda emanated from the Ministry of Defense.

Immediately after the assumption of power by National Socialism, a greatly increased activity began in the German armed forces, especially in the then Ministry of Defense. There seemed to be no financial or budgetary difficulties connected with the employment of civilian employees. In all parts of the building on Tirpitzufer they shot up like mushrooms after a rain. Numerous new organizations were set up, and new sub-sections were created; there was an anxious shutting of oneself off against other sections; the requisition-

ing of men from the army by the Ministry of Defense and vice versa assumed ever greater proportions. The numerical strength of the military district commands doubled within a very short time. The creation of the Air Ministry was for anyone at all acquainted with the situation an open indication that this was the first step toward the creation of a larger German air force.

In the summer of 1933 in the diplomatic radio traffic of various countries could be noted the first indications that people abroad were beginning to pay some attention to this development. This occurred primarily in Great Britain and in Czechoslovakia, then to a certain extent in France and Poland. With respect to the Soviet Union nothing could be ascertained directly, since the entire diplomatic traffic of this country remained undecipherable; conclusions could only be drawn indirectly from the radio traffic of other countries. From this it appeared that Russia was the first and at that time the only country in Europe to recognize quite clearly the development which was beginning in Germany and to take counter-steps of a military character. With regard to the other countries of Europe, nothing of this sort could be noted, not even when Germany quit the League of Nations on 14 October 1933. There was, to be sure, a great deal of talk in diplomatic circles to the effect that Germany was beginning to arm on a large scale. Moreover, columns in the newspapers abroad began to be filled with articles dealing with this topic. In the parliaments questions were introduced and debates were conducted. But from a practical point of view nothing was done in the armies of Europe which could be designated

in any way as an increase in armament, let alone an increase in military strength, which would threaten Germany. Only in the Soviet Union was the military budget increased.

During the course of 1934 German rearmament took forms which could no longer be overlooked by the public. The mere building of barracks was calculated to give information. However, only one who had some insight into the doings of the Ministry of Defense could get an approximate idea of what was really being prepared. Here events and plans began falling all over one another.

Immediately after the assumption of power, Hitler had issued the directive to make all preparations for setting up a 300,000 man army. These plans were easy to carry out, since they coincided with the previous trend of thought and with the preliminary measures already taken. Shortly thereafter instructions came from the Chancellery to make plans for a 500,000 man army. A quarter of a year later Hitler issued a directive to work on the basis of a 700,000 man standing army. After a while this number was increased to 900,000, and later to 1,200,000.

Later on, after 20 July 1944, after he had had him strangled, Hitler spoke of former Colonel General Beck as a miserable weakling who got a nervous breakdown and cried like a fellow with a hangover everytime he had something extra to do. Beck, during that critical period of German armament, was the Chief of General Staff and was regarded in

wide circles as a second Moltke. Beck's military ability - at least in the matter of organization - is beyond all question. However, Beck was a very conscientious man who was accustomed to give all his plans the stamp of precision. The constant changes in directives, the increases of numbers at short intervals, the new instructions constantly issued by Hitler, these always upset Beck's previous plans. It is probably true that many times Beck sat at his desk not knowing what to do and was more inclined to weep than to laugh. The reason, however, was not a wretched weakness of this man, but was the impulsive action and orders of Hitler which excluded any conscientious planning. Hitler's trends of thought doubtless made possible the quick setting up of a great numerical strength but not the solid foundation which is needed for a large modern army. No one knew this better than Beck, and in this fact is found the explanation of his occasional want of composure when he found himself facing the ruin of his previous plans and arrangements.

The first indications that people abroad were beginning to take into military account the situation resulting through German rearmament were found in the summer of 1936, i.e., after German troops occupied the western demilitarized zone. But even now such measures in the European armies were limited to a very meager, not to say pitiful extent. Only the Soviet Union began going ahead in two directions: in the direction of building up a strong armament industry, and in the direction of training a strong military reserve. Otherwise, the situation in almost all the countries of Europe remained practically the same as it had been in 1929. This was particularly true with respect to France.

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When in the early days of February 1938 Hitler carried out his sweeping change in the Ministry of Defense and made himself Supreme Commander of the German Armed Forces, and when he dismissed Colonel General Baron von Fritsch, who had been opposed to any aggressive war, there was no doubt left in the minds of the initiated whither this development was going. This development was also recognized in political circles in most of the non-German countries of Europe. This was most clearly the case in England. Here they began increasing their armaments in the air and to some extent on the water. Czechoslovakia increased the number of its divisions and their effective strength. In Poland the air force was likewise strengthened and a partial rearming of the field army was carried out. Otherwise, practically nothing changed.

Hitler asserted later that increased armament everywhere abroad had forced him to increase armaments and finally to strike. That is totally untrue since the intercept service, which really sized up the situation in foreign armies and air forces down to small details, did not give the slightest support to the claim that increased armaments abroad were forcing Hitler into an armaments race.

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HITLER AND CZECHOSLOVAKIA

There were two countries against which Adolph Hitler made thorough preparations for war from the very first days of his activity as leader of German policy: Poland and Czechoslovakia. Hardly ever in all history has a country been so systematically and deeply undermined and prepared for external attack by the employment of spies, agents, and confidence men (so called V-men), as was here the case. The starting point for this work was afforded by the German speaking element in these countries. By using their attachment to all that was German, in all circles of the German speaking population so-called confidence men were recruited as purveyors of information, partly directly, partly through the VDA (Volksbund fuer das Deutschtum im Ausland or People's League for German Culture Abroad). There was a preference for persons in official positions or in the Czech armed forces but business men, travelers, and the like were also gathered in. It was most valuable when they succeeded in winning an officer of the Czech armed forces as a confidence man, and this happened repeatedly.

Already by the end of 1934 the situation was such that almost nothing that occurred in the Czech armed forces, administration, or industry remained concealed from the German espionage service. The number of individual reports on Czechoslovakia reaching the counterintelligence unit in

Berlin averaged from five to ten daily. Often there were micro-films of original documents including information on the most secret matters.

Eavesdropping on telephone conversations played a particular part in this spying on the Czechoslovak state. For this an entire system of listening stations had been set up. The results were sent to the counterintelligence offices in Broslau, Dresden, and Munich, or to their advance branches, and passed from here to Berlin. All cable lines leading out of Czechoslovakia which touched German, Austrian, or Hungarian territory were monitored. For this purpose there was close cooperation between the German, Austrian, and Hungarian espionage and cryptanalytic services.

Much energy was devoted in Germany to setting up the radio intercept service against Czechoslovakia. However, in this field there was little success. As early as 1933 there was collaboration between the German intercept service and that of the Austrian and the Hungarian armies, but the Czechs were so cautious in their use of radiotelegraphy that the results were only moderate.

A very clear indication that the Czechs had been selected by Hitler as the object of a military attack was to be had on 24 December 1936. On this unusual day there occurred at the Cipher Bureau in the Ministry of War at Berlin a discussion with officers of the Air Ministry. The subject was a new organization and a strengthening of the intercept work against Czechoslovakia. The main theme was a surprise attack. The Ministry for Air took the initiative and it looked as if the air force were to play the chief role. Not until later was it clear why the Ministry for Air took

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the lead in this and later conversations: Göring and his staff favored the plan. Colonel General Baron von Fritsch, Commander-in-Chief of the Army, was opposed.

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