Weather; its Role in Communications Intelligence

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An introductory discussion of the collection, transmission, and use for intelligence purposes, of meteorological information.

INTRODUCTION

From the floods and famines of Biblical times to the "dust bowls" of the 1930's, history has found man helpless before the elements. His economics and his politics step obediently aside, and a fortiori his military campaigns are crumbled into pieces. Lacking the aerological units that accompany modern expeditions, the Spanish Armada was completely destroyed by a great storm and Napoleon's army crawled back in fragments from the icy rigors of a Russian winter. There has surely never been a better case for the application of the maxim, "If you can't lick 'em you should join 'em"; and it comes as something of a surprise that it was only with the advent of World War II that armies and navies began to make full use of the resources and techniques available, in an effort to predict the weather and have their battle plans coincide with it. Few if any major invasions or landings undertaken during that struggle failed to take account of the expected weather, and it is agreed that this precaution was a vital factor in their success. Not only was good weather exploited offensively; in at least one brilliant instance, bad weather was used offensively. The breakout of the Germans at the Ardennes Bulge in December of 1944 was timed to coincide with extremely poor flying weather, occasioned by dense fog and low clouds, which prevented us for a considerable period of time from giving air support to our forces or from strafing theirs. Thus, it can be seen that information on weather is a very valuable commodity in wartime, and one which must be treated as a secret weapon if it is to be used to advantage.

Because of its perishability, this secret weapon must be supplied to our own forces on a rapid and timely basis and precautions must be taken to deny it to the enemy. Accordingly, one of the first steps taken by belligerents when mobilizing for hostilities is to impose strict security measures on all types of weather information. This is accomplished by the encryption of all weather transmissions, alteration and consolidation of weather broadcasts (usually by the military), suspension of weather reports and forecasts given out by commercial media,

and so on. It is at this juncture that a weather COMINT unit becomes of vital importance, since, in the final analysis, if any weather information from enemy sources is to be obtained, it will in all probability be obtained by such a unit.

A Weather Unit has been included in the COMINT effort since the early months of World War II. This article attempts a brief discussion of the NSA Weather Unit in the hope that analysts throughout the Agency may better understand its function, and avail themselves of its services should the need arise. The discussion has been divided into two sections, the first dealing with weather[1] as the end product, and the second devoted to the intelligence which can often be derived from analysis of weather traffic.

WEATHER AS AN END PRODUCT

When speaking of weather as an end product, or weather for weather's sake, one implies the actual use to which weather can be put in offensive or defensive warfare. As previously stated, the prime function of a COMINT weather unit in wartime is that of supplying vital weather information from enemy or target countries to the meteorological organizations of the various branches of the Armed Forces, according to their varying needs. Land forces, for instance, planning heavy ground attacks can be seriously hampered by heavy rains with attendant mud and swollen streams, by heavy snowdrifts, or by dense fog. Naval forces planning to put assault troops ashore can meet with disaster if high winds and heavy seas are encountered; a typhoon or hurricane encountered at sea can result in loss of life and considerable damage, particularly to smaller vessels. Strong surface winds, severe turbulence, and icing conditions and heavy snows on runways seriously hamper aircraft operations.

Weather is most simply classified in time: past, present and future; and in space: surface, upper air, and—as an anomalous third class—hydrologic.

Past Weather includes records of all meteorological phenomena which are used to compile climatological records. These can include records on a daily, monthly or annual basis of temperature extremes, snow and rainfall amounts, prevailing winds, cloud cover, river stages, beginning and ending periods of ice on waterways, harbors, and the like. This type of information is, of course, the easiest to come by in wartime, as most of the material will have been compiled by far-sighted nations through the years. By the same token, it is of the least importance in day-to-day operational planning. Its real value is shown

[1] "Weather information" is inevitably shortened to "weather" among professionals, and we shall use the abbreviation henceforward.

primarily in long range planning and strategy. [redacted] NSA does not concern itself with the compilation of records of this type; they are maintained by the weather branches of other U. S. Government agencies and are readily available.

Present Weather, as the term implies, is limited to conditions currently prevailing over any given area or region. [redacted]

[redacted]

Future Weather is, in the main, the forecast predicted on Past and Present Weather. [redacted]

[redacted]

As to our subdivisions: *Surface weather* includes all weather phenomena on the earth's surface, both land and sea; *Hydrological*, deals primarily with surf and sea conditions, water levels, ice conditions, and related elements; and *Upper Air* includes all weather phenomena occurring above the earth's surface, and is thus the most important of the three. We turn next to the question of how these various types of information are transmitted.

COMMUNICATIONS, CODING AND ENCIPHERMENT

In general, special channels for the exclusive transmission of meteorological information are maintained by the civilian weather services of all nations. The military services, particularly the major commands, likewise have special channels set apart for the dissemination of weather data, but may, and very often do, employ other nets (operational, administrative, etc.) for the same purpose. All forms of report, ranging from the frequent weather forecasts on commercial radio and television to the complex map-analyses transmitted on radio facsimile, are employed. This discussion restricts itself to Morse transmissions, since the spoken word, as used to convey weather information, is frequently restricted to civil and commercial channels, and in national emergencies would cease to be a source of data.

For expediency, clarity, and brevity, weather services of all countries use codes for the transmission and exchange of weather information. These codes, when used internationally, have a common

format, and as such they surmount the language barrier and may truly be termed the "language of weather." In addition to these, however, many countries design their own weather codes for internal usage.

[redacted]

The following message illustrates a type of weather code used extensively by all nations in the exchange of meteorological data, and capable of being readily decoded by weather personnel anywhere:

02518 27612 82203 96819 03110 893XX 08815

By interpreting the above seven groups a trained weather man in any part of the world could readily determine the following weather elements:

0	Null or filler
25	25th day of month
18	1800 hours, Moscow
27612	Weather indicative for Moscow
8	Sky completely overcast
22	Surface wind from southwest
03	Wind speed: 3 meters per second
96	Horizontal visibility, four kilometers
81	Present weather: rain showers
9	Past Weather: thunderstorm
031	Atmospheric Pressure: 1003.1 milibars
10	Air temperature: 10 degrees Celsius (50° Fahrenheit)
8	Amount of low cloud is ten-tenths
9	Type of cloud is Cumulonimbus
3	Height of base is between 200 and 300 meters
XX	No middle or high clouds visible
08	Temperature of dew point is 8 degrees Celsius
8	Pressure is falling steadily
15	Pressure has dropped 1.5 millibars in last 3 hours.

In addition to reading and understanding the weather codes, it is equally important to know the source, and hence the location, of the

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weather being recorded. Obviously a weather report has little if any value when the area or region from which it originates cannot be determined. As in the case of weather codes, most countries in the exchange of weather data subscribe to a universal system of identifying weather stations by means of a five-digit number preceding the report. However, on internal weather networks of some countries unique methods are employed. [redacted]

[redacted]

During wartime the nature and character of meteorological information presents special problems with respect to security. The perishability of the data is such that rapid handling and dissemination are required. This factor will often affect the degree of security of the cipher system. The advantages to be gained by the speed of delivery to one's own forces may sometimes outweigh any advantage to be gained by continued denial to the adversary; it would thus be more expedient to employ either a simple cipher or, in some situations, to transmit the weather in the clear. Other disadvantages encountered in the encipherment of weather traffic are the vast bulk of information involved and the stereotyped nature of the message forms. Methods of encipherment are then, of necessity, so many and varied that the discussion of them is best left for a separate paper dealing exclusively with this aspect.

INTELLIGENCE FROM WEATHER REPORTING

Intelligence information inherent in a country's weather communications takes many forms and covers a wide variety of items, ranging

[redacted]

Some of the more obvious and common items from the above will be discussed.

a [redacted]—As stated previously in this article, weather reports are of little or no value unless the source of such reports can be quickly determined. This requirement necessitates the inclusion in the report of a means of rapid identification. [redacted]

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