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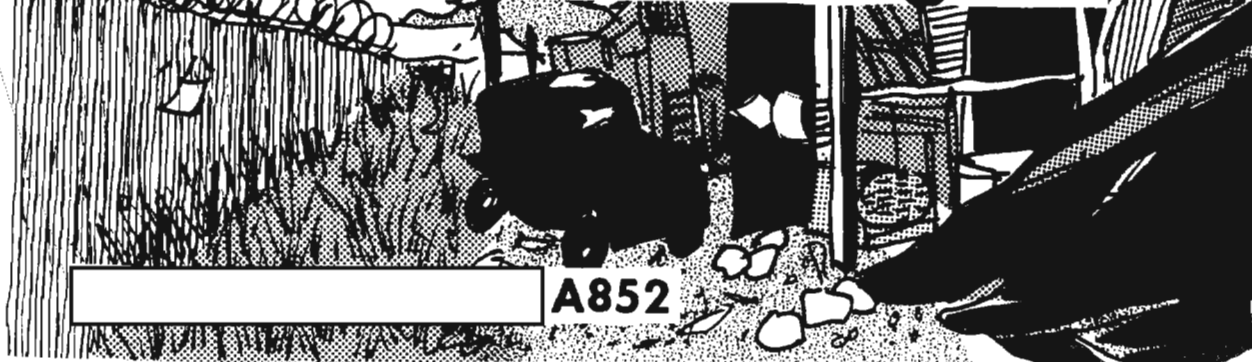## FORT GEORGE G. MEADE, MARYLAND

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ONE DAY IN DANANG: Other Duties as Assigned

A852

It's 29 November 1974. At about 1000, Lieutenant⬚ and I leave Danang Center in my jeep and drive to the site on top of Monkey Mountain. We get there just before 1030 and go right into the intercept van. I immediately notice that the men aren't using their KY-8 secure voice equipment when talking with Danang Center via radio. In fact, they not only don't have it turned on, but don't even have it hooked to the VRC-46 transceiver.⬚explains that the men use the KY-8 only when they have to pass intercepted VC messages to the Center. He says that they are afraid to burn it out, as it gets quite hot after being on for a while. I hit the roof over this. All the work we've gone through to install secure voice communications and they won't use it! When you consider how much intelligence Danang Center gets from low-level VC voice activity, you'd think these guys would realize that their own communications are just as susceptible to intercept. I instruct⬚that his men should *never* communicate with the Center in the clear now that they have the KY-8s and assure him that they don't have to worry about burning the gear up. If they can cook their rice on the KY-8, all the better. Heat has no effect on it.

Then I go out to look at the antennas. I find that the SHF corner reflector is oriented a little off-compass and the bottom half of the cage has slipped loose. Fix it. Then I look in the building that has been proposed for the site expansion. I have some misgivings about it (more about this later).

At about 1045,⬚and I are back in the van when we feel a shock wave sweep over us. We all go outside and watch as a great black cloud forms over the south end of Danang Airbase, maybe 15 miles crow-flight from us. At the time, it looks as though the source of the smoke is quite close to Danang Center, so⬚and I head down off the mountain immediately. As we descend, we feel two more shock waves.

When we arrive at the airbase gates, the ARVN guards won't let us go around the south end of the runway. We have to get to the Center by going via the back route. From the Center we can see that it's the Army/Air Force ammunition dump at the south end of the runway that has gone up. Flames are still shooting up and small stuff like mortars and rockets are still exploding. The first explosion we had felt and the other two shock waves that rolled over us as we were coming down Monkey Mountain apparently had originated at revetments of 500- and 750-pound bombs. The Center is about 4000 feet from the dump, so no bomb or shell fragments have dropped within the compound.

The concussion waves have done some damage. The first one ripped the doors off the Morse intercept bay and a few other buildings, and knocked the fluorescent tubes out of most of the fixtures. A couple of the antennas look as though they have been pushed over a bit but they should be easily fixed. Luckily, no one was hurt.

⬚has evacuated almost all the men from the Center and sent them to the barracks area to check on their families and homes. Lieutenant⬚and I look into the Morse intercept bay. I notice that some of the men have forgotten to turn off their R-390s before leaving. The Center had lost all power when the dump first went up, but if the radios aren't turned off now the returning power might burn them out later.⬚and I take a couple of minutes to walk down the four racks and make sure the 96 radios are all shut off.⬚had thought to tell the men to put their typewriters on the floor before leaving. Good idea.

⬚says he has heard that two Americans have been hurt down in the EC-47 aircraft area. Two American contract firms work there. Bendix maintains the Doppler navigation gear and Harris Corporation has the contract for the Airborne

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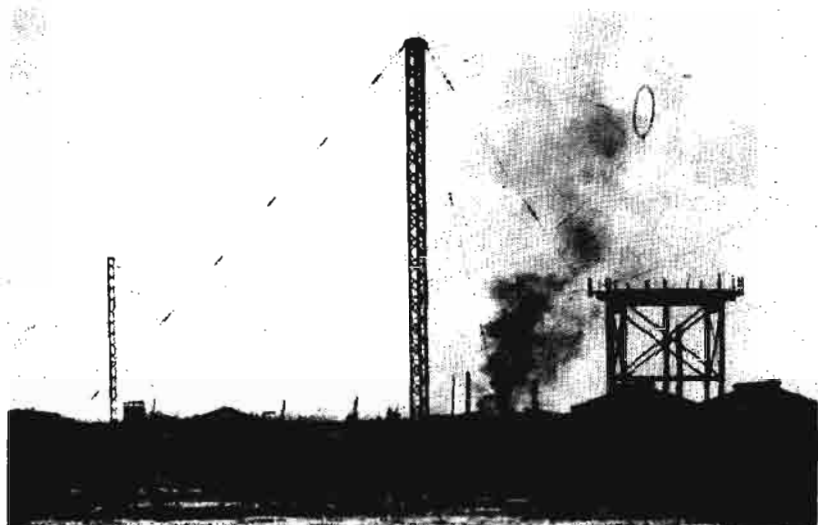
Explosion as seen from Danang Airbase. The ammunition dump is about one mile away.

Radio Direction Finding (ARDF) system itself. I know most of the men well. At this time, only small stuff is still exploding. I'll see how close I can drive to the EC-47 hangar, which is about 150 feet from the closest bomb-storage revetment.

I get within 1000 feet or so and stop to see if I can spot anyone moving in the hangar area. A jeep comes up from behind me. Two of the Harris guys -- Burt and Paul. I've played some softball with them before and seen them in their work shed. Burt says that the Bendix chief, Jim Gaunt, got a few cuts when a fluorescent tube dropped on his head. Nothing serious though. No other injuries, but a Harris man is missing. He was due to report for work at just about the time the dump first went up. Possibly he was driving past the dump at the wrong moment and is still there. No one has been able to get close enough yet to look for him.

Burt says that when the explosions started -- maybe 100 yards from their shed -- everyone on duty hit the door and drove to the Air America terminal on the other side of the runway. Same for the guys in the Bendix shed. Harris had a bunker in their shed, made from 55-gallon drums filled with sand and roofed with railroad ties. It would have taken a direct hit to shake it. Bendix had an underground bunker that would have held 20 men. Funny, neither

group thought to get in the bunkers when it started.

Both groups had left a lot of personal stuff in the huts and the doors wide open. Also, Harris had a lot of classified papers regarding ARDF gear. Burt and Paul want to try to get to their hut to get their stuff and the papers before the Vietnamese loot the place -- that would be sure to happen as soon as it was safe to get into the area. I tell them I'll go along and help them.

Two jeeps. Three of us. We drive a bit closer on this road but there is a lot of shrapnel ahead. We decide to go through the Air Vietnam terminal and then drive down the runway and into the hangar area. We pass a bunch of ARVN troops crouched under the side of a row of CONEX containers. They stare at us stupidly as we drive by. Who's stupid? It's like the Fourth of July on the other side of the hangar where we're headed.

I get to the huts, park, and look into the Bendix shed. It's a shambles. Burt and Paul head for their own shed, and I follow. Their place is a mess too. Gaping holes in the walls. Lights smashed on the floor. Chairs pushed against the walls in the rush to get out when it started.

Burt takes a 12-pound sledge and knocks four padlocks off desk drawers in a few seconds.

Explosion scene from about 3/4 of a mile away.

Paul and I gather briefcases and cardboard boxes and start filling them with secret papers and personal things. Cameras, passports, radios. The sound from the exploding part of the dump is getting more intense. We make two or three trips to the jeeps, loading stuff, keeping as low as possible. I notice something: the sound of ricocheting bullets sounds exactly as it does in the movies. Hell of a time for a thought like that. Paul crawls into their bunker and drags out flak jackets and steel pots for the three of us. Black smoke is rising from across the street.

Back in the hut. I grab two filled briefcases and head for the door. Burt and Paul behind me. They also have a load of stuff. I put out a hand to push open the door when a shock wave knocks me to the floor. My shoulder hits the side of a desk. I'm on my hands and knees. I look up. The door I was reaching for is gone, wrenched from the hinges. Pieces of insulation, wood splinters, and papers are flying all about me and outside in front of the doorway. The trash seems to be floating to the ground in slow motion. It's weird!

What had happened? A revetment of 750-pound bombs had gone up all at once. Why? Sympathetic detonation from a neighboring revetment? Heat from the burning bomb crates? A falling mortar

An Air America helicopter destroyed by falling fragments.

shell? Or maybe a VC time-charge had set them off. No matter now. They're gone with a tremendous roar (we learn later that they blew windows out of the Consulate 15 miles away). Jagged pieces of bomb shell, colored purple from the heat of the detonations. I see them dropping all around and I can hear them tearing through the tin roof over my head. U.S. bombs -- the best in the world.

A man is like an eggshell, a paper bag, a balloon filled with water. A tiny piece of this steel can rip through him and let out the stuff that makes him alive. Is this what the VC go through out there in the jungle? In Hanoi they recruit him, give him some basic training, and tell him to walk south on the Ho Chi Minh Trail with a 122-mm rocket strapped to his back. If he's lucky, he'll only have to walk this far, to Military Region-I. If not, he'll walk all the way to the Delta. Maybe a thousand miles. They'll take that rocket from him and fire it. It misses. They tell him to go back and get another, and he does. Can we beat a man with that mentality? Lord help you, VC, out there in that jungle when arc light shines down on you.

What about Burt and Paul? They had been right behind me. I look back. Everything is black. Great gaping holes in the walls and ceilings, and sunlight streaming in,

The ARDF aircraft hangar adjacent to the Bendix and Harris Corporation huts. Concussion caused most of the damage.

The Sidewinder missile assembly shed across the street from the Harris hut.

looks over my jeep and tells me his story. He had been standing with a dozen or so people, awaiting the incoming flight from Saigon. The others were mostly Consulate civilians, USAID types, orphanage people, and some dependents. Bill saw the fireball of the first explosion and hit the deck. He had learned at Khe Sanh. He yelled for the others to get down, but they stood there and watched the explosion until the shock wave rolled across the half mile of runway and knocked them all flat.

As we're standing there, Jim MacNiel, the chief of the Harris people, arrives. He intends to send some men to the hangar area as soon as it's quiet, so they can protect the test equipment in the sheds. But something more substantial has to be done. We're already a month into the rainy season and it's only by luck that we didn't get a storm today. All the electronic equipment in those two sieves of huts will be ruined if we don't get it under cover. I tell him I'll try to locate a safe storage area.

I leave and drive downtown to the ☐ logistics compound. When I arrive, I must look a mess. Pretty dirty at this point and my hair all windblown from the lack of a windshield in my jeep. I exchange my wreck for a new jeep and drive over to the housing compound, where I find Ron, the ☐ logistics officer. I explain to him what has happened and ask if he can loan us some space in one of his warehouses so we can store the Harris and Bendix equipment until we can locate a new permanent shelter. He says no sweat. Then off to the Consulate, where I get chewed out for not having my radio with me when I went up to Monkey Mountain in the morning. Apparently the Consulate people thought I was at Danang Center when the dump went up, and were afraid I'd gotten zapped. They'd been trying to get me on the radio all morning. Then back to the airfield, where I look over the warehouse that Ron says we can use and where I beg the use of a flatbed truck from the Air America people. They also cooperate beautifully. Everyone pulls in a crisis. Then to home and a shower.

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but the dust is so thick that the light does nothing. I don't move. I should yell to them and ask if they are okay, but I can't: I'm afraid I'll get no answer. Silence.

Then one of them speaks. "Everything okay?" The other answers. Me too. They come out of the gloom and we rush to the jeeps, throwing the stuff in the back. Something is wrong with the front of my jeep. I look in the door. The windshield is gone, and so is half of the dashboard. There is a basket-sized hole in the canvas roof and pieces of concrete all over the inside. In my seat is a piece of concrete that must weigh 30 pounds.

Burt and Paul dump their loads and go back in the hut. The sounds from the dump are building again. Paul is at their safe, spinning the dial. I yell at him to leave it -- no one is going to get into it for a while. He agrees and goes on to something else. We make one last trip to the jeeps and then climb in. A huge black cloud of smoke is rising from the last revetment that went. We are so close that the cloud is directly over us. Not enough time to move the concrete block in my seat. I climb on top. My jeep is at the head of the alleyway. If it doesn't start, I'll be blocking in Burt and Paul. It starts. We drive back onto the runway with the gas pedals to the floorboards.

Back at Danang Center we unload the classified papers and put them in my safe. They fill one drawer. Then over to Air America, where we find the Harris man who had been missing. He had been a mile or so from the dump when it started to go, and had gone right over to Air America to watch the show.

Staff Sergeant Bill Sparks, chief of the Marine Security Guard force at the Consulate,

That evening I meet Burt and Paul and MacNiel and some of the others in the bar. MacNiel says that when he was finally able to get some men back to the sheds, they arrived to find some Vietnamese looting the place, but he doesn't think they got much.

We talk about what has already happened and what we'll have to do tomorrow. We have to beat

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the rains, so we'll meet at the sheds at sunup
and start moving the stuff to the warehouse
with the flatbed and what pickup trucks MacNiel
has. I'll also try to get the loan of a fork-
lift so we can move the safes and other heavy
items.

I see Ron, the [ ] logistics man, on the other
side of the bar. I go over and buy him a drink.
He says they haven't determined why the dump
went up. Rumors are rife, though. Some say a
South Vietnamese fighter/bomber started it by
dropping a bomb in the dump. Another story says
mishandling of some ordnance inside the dump
was the cause. And of course VC sabotage is men-
tioned. In any event, we can expect the VC radio
broadcasts to take credit for it. The VC are too
good at propaganda to pass up an opportunity like
this. I buy Ron another drink and then ask if I
can borrow his fork-lift for a while tomorrow.
He hesitates but agrees. I don't like to push
my friendship with Ron too far and, of course,
officially he's not supposed to support me or
Danang Center too much. But he's a good guy.

MacNiel says he can keep the ARDF systems
working for about 2 weeks but by then he'll
have to be set up in a new shop and have his
maintenance equipment working or we'll be
out of business. Keeping the ARDF birds
flying is critical to the intelligence prod-
uct for Vietnam, so I'm going to concentrate
on helping these guys for a while. Captain
[ ] should be able to get Danang Center
back on its feet by himself. Not too much
to do there anyway, except clean up the
broken glass and fallen ceiling tiles and
put the doors back on.

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Tomorrow is going to be another busy day.
First to get the equipment under cover and
then to start looking for a new permanent
home for the stuff.

Burt and Paul and I buy each other a few
drinks. Then to bed. It's been a long day
and tomorrow is only a few hours away. To-
morrow is 30 November 1974.

~~(SECRET - HVCCO)~~

WILL THE REAL ELINT PLEASE STAND UP?

[ ] .E23

For one reason or another, a number of peo-
ple in this Agency maintain a low profile. The
lowest profile, it seems to me, is not kept by
the people who skulk around behind the cipher
locks and won't speak to you unless you are
cleared for STEINMETZ. We often have an idea
about what they are doing. We may not, or
should not, know the sources of the material
they work with or the degree of success they
enjoy, but we know something about what they do.

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The only people who know anything about
ELINT, however, seem to be other ELINTers. We
COMINTers know that there is such a thing as
ELINT. Thanks to an article by [ ] we
even got a tantalizing glimpse of what ELINT is
all about -- or at least one phase of it. But
information on the subject is hard to come by,
and anything outside of some sketchy defini-
tions is known only to a few people outside of
the ELINT field itself.

Recently a group of veteran COMINT collec-
tors[2] was discussing this subject. The usual

experience was that, 20 years ago, they had
been taught that SIGINT comprised:

- COMINT -- intelligence derived from any
  kind of emission by which information
  was transmitted; and
- ELINT -- intelligence derived from any
  other electromagnetic emission.

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Some of the questions posed in the pre-
ceding paragraph are "semi-tongue-in-cheek."
I have heard valid answers to all of them
at one time or another. But the subject is
one which is of interest to a vast number
of NSA-ers and deserves attention by someone
qualified to discuss it.

~~(CONFIDENTIAL)~~

[ ] "The Uses of ELINT," *CRYPTOLOG*,
April 1975.

[2] See: [ ] "What Is a Collector?",
CRYPTOLOG, August 1974.

~~SECRET~~   ~~HANDLE VIA COMINT CHANNELS ONLY~~

WHAT'S THE BEST LOCATION FOR THE
COMPUTER-APPLICATIONS FUNCTION?

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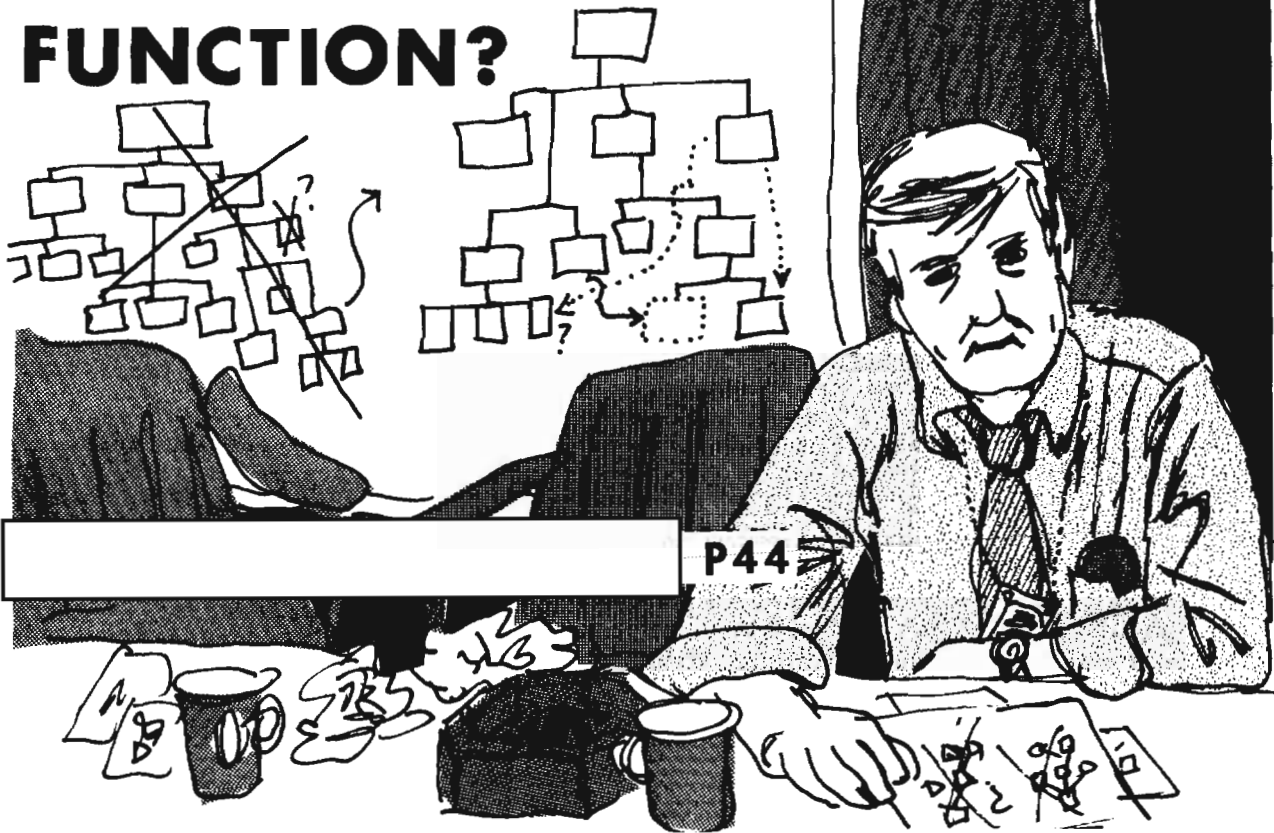
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> *The following article was originally written as a paper for the American University graduate course "Systems Approach to Management." It is being printed here because the question with which it deals -- where to locate and manage the applications-programming function -- is one of continuing concern to the Agency.*

Much has been written in recent years about management of the computer-processing function and where the computer-processing department belongs in the overall organization. Most articles on the subject address the entire range of computer-processing activities (systems analysis, programming, and computer operations) as being within a single EDP (electronic data-processing) organizational structure, and then they discuss the placement of that whole structure in the organization. This article will discuss as background some of the reasons for placement of the computer department in the organization but, more specifically, it will address the location of the applications-programming and systems-analysis functions in the overall organization.

"Historical" Location of the Computer Department

In *Computers in Business* Donald H. Sanders discusses three locations for the computer department in the organization. These locations are viewed as a function of "the size of the organization, the applications to be processed, the degree of systems integration achieved and sought, and the importance attached to information systems by top executives." They generally fall within the following functional areas:

- *finance* (This situation prevails in the majority of businesses. The primary reason for such location is that, historically, finance departments were the first to recognize and take advantage of the benefits offered by data processing);
- *research and development* (R&D); and

- *analysis* (The location of the computer department within the R&D or analytic functional areas is noted in organizations that are heavily R&D oriented and in certain government agencies that have scientific and analytic functions).

Among these three functional areas, the computer department was initially located in the area that originally sponsored the use of computers. Some drawbacks of this choice of location, according to Sanders, are "possible lack of objectivity in setting job priorities, possible limited viewpoint, and possible lack of organizational status."

An alternative is to create the computer department as a service center located on the periphery, outside the main organizational structure. The drawback of this location is that such a computer department is usually a weak and subservient component at the mercy of the functional component that is sponsoring it.

In medium-sized and larger concerns it is believed that the best location for the computer department is as a separate department in the organizational structure, with the same status as the other primary line elements such as marketing, finance, and production. Arguments that support this location are:

- the ability of the computer department to provide impartial service to all user components; and
- the ability of the computer manager to express an influential voice in systems development.

Another Approach

John Diebold takes another approach to the problem of computer-department location. He states that the higher the level of applications sophistication, the higher the level of management to which the EDP manager reports. Diebold has identified five levels of applications sophistication, as follows:

- Level 1 -- historical accounting (At this level, computers carry out only the functions usually related to payroll, sales accounting, or financial control);
- Level 2 -- the firm "has achieved means for supporting the main operating departments on a current, rather than a historical basis" (Carl Heyel, *John Diebold on Management*)
- Level 3 -- a significant amount of operating information is processed by computer and some management reports for some of the major departments are created;
- Level 4 -- a general data base is available and a significant amount of reporting is done by computer not only to the department management, but also to the Executive Vice-Presidential level;

- Level 5 -- "the basic transaction-activity information within all major functional areas of the firm is being captured and introduced into a data base." The data base then serves the needs of all departments without duplicating or overlapping files.

One can readily see that at Level 1 the computer department needs only to report to a line manager somewhere down in the organizational structure. But at the Level 5 stage of development, the computer manager must report to the highest level of corporate or agency management.

Further Background

Now that we have considered two approaches to the location of the computer department within the organization, we should briefly discuss as further background the general functions necessary to support a large-scale computer-processing effort. For the purpose of this article we are assuming an ongoing bulk-processing system which is used by a number of organizations to analyze, validate, and interpret large amounts of data. One function necessary to support the computer is *computer operations* -- the people who actually run the computer and who control the input and output, maintain the various libraries, and set up the job schedules. This function sometimes includes maintenance, but with a large-scale computer, maintenance is usually handled by the manufacturer.

Another major function required to support the processing efforts is the *systems-analysis and programming function*. In the systems-analysis area this function includes:

- the development of new applications, and
- the translation of user data-processing requests into program specifications.

The programming function includes:

- the preparation of programs to support new applications, and
- the maintenance of existing programs.

Using another approach we can talk of this function in terms of *applications programming* and *systems programming*. One definition of applications programmers is that they are "very often individuals who have been trained or hired by a specific company and are usually highly knowledgeable of the problems for which they are programming. Systems programmers write the programs that run the computer equipment and generally are employed by the computer manufacturer" (Orville Elliott and Robert S. Wasley, *Business Information Processing Systems*). We would define applications programming as that programming which supports user requirements. Systems programming includes such functions as development of generalized software routines which can be used by other programmers, and maintenance of the various libraries.

Where Should the Applications-Programming and Systems-Analysis Function Be Located?

We shall now discuss the applications-programming and systems-analysis function and the advantages and disadvantages of locating that function in different parts of the organization. First. we will look at the function as part of a central computer component along with the systems-programming and operations function. Second, we will look at the function as separate from the central computer component (in this situation the applications function will be a part of the user component for management purposes). Finally, we will consider the applications function as part of a project-management office separate from the central computer component and the user component.

Centralized Function

The advantages of having the applications-programming and systems function as part of the central computer component are several. First, it is easier for the programmers and systems analysts to keep up with new systems developments because they are in the same component. The information flow is probably better within a given component than between components, so that data related to systems changes would be available more quickly. Another advantage stems from the sharing of programming techniques among programmers who are working on various applications for different parts of the organization, but who are located in the same programming component.

From the management standpoint, there are a number of additional benefits from this type of working. The programming function is easier to control. Standards can be applied to programming across the board and, with the programmers in one component, management has a better chance of enforcing these standards. This could result in more consistency in the software. Also, by sharing software-development ideas, cost savings in software development would result if subroutines were developed once and used by several programmers. Finally, if the overall organization is at Diebold's sophistication Level 5, the applications component would exert some influence in determining the type of applications to be developed and could ensure a consistent approach to problems of systems development, independent of the parochial interests of the various components.

There are several disadvantages to the centralized computer-applications function. One primary disadvantage is poor communications with user components, a situation which cannot be taken lightly. At a recent conference of 20 EDP executives from corporations that had annual revenues or

a total budget of more than $1 billion, their primary long-range planning objective was "to increase communications and cooperation between the EDP group, its users, and top management" (John V. Soden, "Programmatic Guidelines for EDP Long-Range Planning," *Data Management*, September 1975). Another disadvantage of this concept is that the user never seems to get what he has requested. When results are provided to the user, a typical reaction is, "That's not what I really wanted." A third disadvantage of this organizational setup is the user's lack of trust in what is being done with his data.

Decentralized Function

An alternative to the central computer-applications function is to locate the applications programmers/analysts in the user components as something like "open shop" programmers. The obvious advantage of this setup is that a close relationship can develop between the programmers and the users. As a result, the user probably has a better chance of getting what he wants from the computer-processing system. In a small computer complex, this situation might be very beneficial, but in a large organization it would probably be very costly.

The disadvantages inherent in this type of organization are several. First, there is a tendency for each user component to have its own programmers develop specific applications tailored to its individual needs. Also, standardization is difficult to enforce, particularly if the user components are autonomous and have a great deal of flexibility in developing computer applications. Efficiency in terms of the actual software performance may also be sacrificed.

Project Management

A final possibility for the applications group is to make it part of a project-management office separate both from the central computer component and from the user component. The advantage of this type of organization is that it is easy to develop systems with overall organizational goals in mind and without the parochialism of individual user components. The primary disadvantage is that the programmers are still separate from the benefits of the central computer component.

Obviously, there are no absolute solutions to this dilemma. One must evaluate a number of questions before deciding what is best for a given organization. Factors such as the size of the overall organization, the complexity of the applications, the size of the EDP component, the autonomy of the line elements in the organization, and management experience will dictate what is best in a given situation. Management should exercise extreme care in obtaining the proper balance to obtain the best EDP production for the best price.

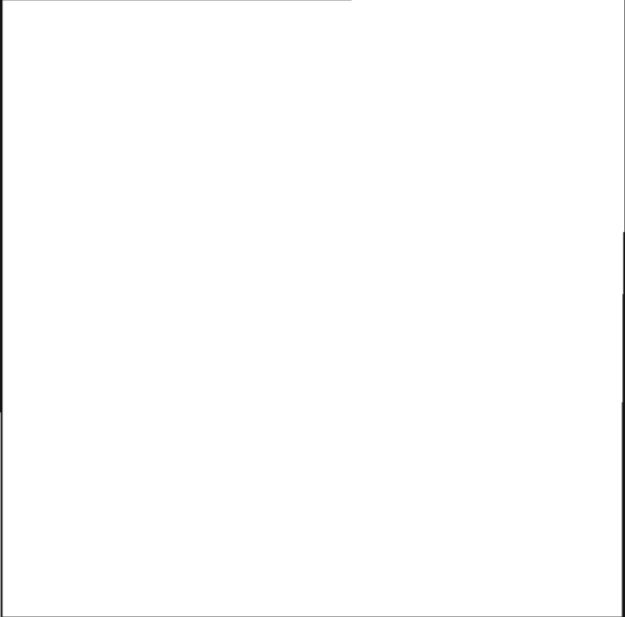I'LL MEET YOU DOWN AT THE CORNER...

...OF PAGE 17

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ON BEING TRUTHFUL
DAVID W. GADDY, D5

It was amusing to read Vera Filby's account of the bafflement felt by the roomful of SIGINT people confronted with the question which she adopted as her title, "How Do We Know It's True?" (CRYPTOLOG, February 1976). Amusing, because it sketched a cartoon illustrative of the charge sometimes leveled at us: we're accused of being the product of too much inbreeding, of too much isolation from the real world in which our recipients live. "After all," she characterizes the reaction, "to us in the business there is no such question: if it's SIGINT, then it *is* true, by definition." I recently heard the same thought expressed this way: "SIGINT doesn't lie." (That, of course, might prompt a facetious rejoinder, "Well, SIGINT might not, but I just don't know about some SIGINTers. . .")

This conception, this idea of being on the side of the angels, appeals to what seems to be ingrained in the American character -- the desire to be the good guy, the guy in the white hat. In this particular case it has about it an unseemly air of intellectual arrogance, which I think is neither warranted nor intended, as further reflection will show.

Consider COMINT: COMINT is comprised of crypt intelligence (CA results, decrypts) and traffic intelligence (TA results).

what [ ] once termed a behavioral science, a somewhat less precise field than mathematics -- the study of human beings, signal officers and radio operators, each with his predilections involving his profession, security, and circumstances.
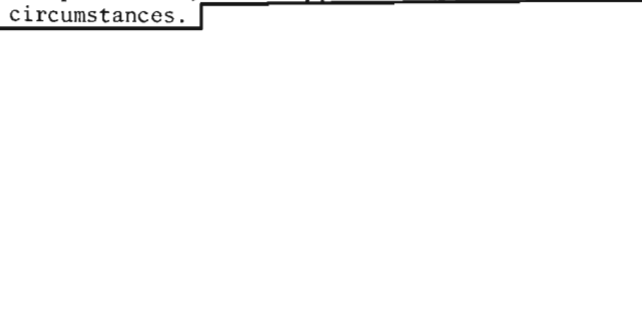
I think, on the contrary, that "SIGINT equals truth" is a grossly oversimplified, shorthand way of conveying something I do believe in and believe merits just the sort of consumer education Vera espouses. That "something" is the professional, intellectual attitude which motivates "the real SIGINTer." I know of no comparable body of craftsmen so sensitive to the uncertainties of their profession, so painstaking with accuracy, as SIGINT reporters, and who work under the stress and strain of events and time constraints which characterize the SIGINT reporter's world.
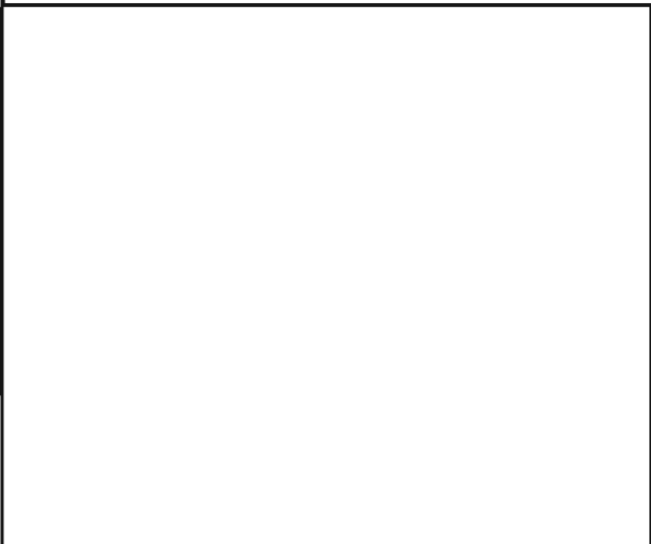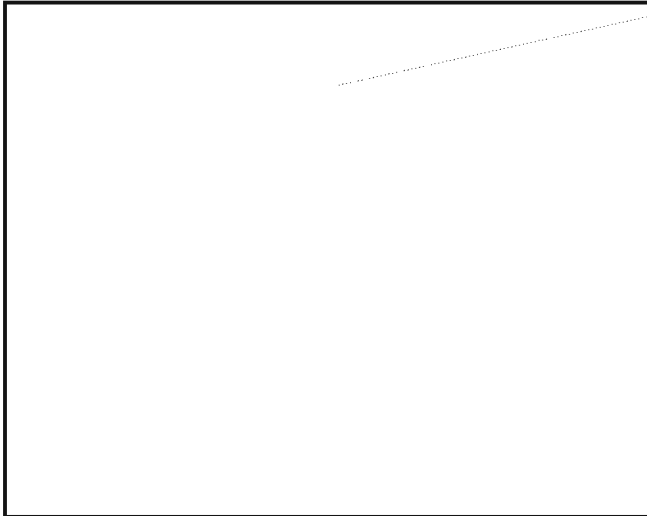
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So, if we see it in print, resulting from decryption, "it must be true," right? Consider TA: At the risk of offending some colleagues again, let me observe that much, if not the bulk, of traffic analysis is in the realm of

SECRET

The challenge is to effect a fiduciary rela-
tionship with our recipients and to maintain it.
That entails education, indoctrination, and
training on both sides, but above all it requires
honesty. It means that we cannot simply insist
that "it's true because I said so, and I speak
SIGINT." We must openly deal with the weakness-
es as well as the strengths of our chosen spe-
cialty, not let pride and enthusiasm blind us.
We must face up to the possibility of deception
and deal with it honestly and professionally,
as Vera proposes, not dismiss it by claiming
we're too smart to be fooled. We must figure
out ways of protecting our sources and methods
while retaining consumer confidence in our con-
clusions.

Sanitization -- protection of our sources
and methods -- thus becomes an added burden for
the SIGINT reporter.

Finally, as members of the intelligence pro-
fession, we must accept the fact that, in spite
of all we do, there will be times when we simply
will not be believed. Rejection of intelligence
(as one of our pundits once said about communi-
cations *in*security) is a commander's prerogative.

(SECRET HVCCO)

The Voynich Manuscript Revisited Pt6

The Voynich Manuscript, an object of interest
off and on since the seventeenth century,
contains over 200 pages written in a partially
cursive alphabet which has proved indecipherable.
Equally enigmatic are the large number of
drawings -- of plants, few of which are identi-
fiable, and of naked women sitting in tubs or
emerging from pipes (one writer has called the
latter a "plumber's nightmare").

The history of the manuscript, which has been
detailed in other places, needs only passing
mention since it does not throw any light on the
content. Dating from about 1500, it was said by
Joannes Marci, mathematician and orientalist at
the University of Prague, to have belonged at
one time to Emperor Rudolf II (1576-1612).
Marci writes in 1666 to the Jesuit Athanasius
Kircher, in Rome, that he was making a present
to the latter of the manuscript, the author of
which, he had heard from another source, was
the great medieval scholar Roger Bacon. (How
Marci came into possession of it, I do not know.)

Marci himself withheld judgment on the attri-
bution, but at least one scholar since his time
became intrigued with the notion of Baconian
authorship. Professor William Newbold of the
University of Pennsylvania was convinced that it

was an enciphered text prepared by Bacon and he
worked on this assumption from 1919 until his
death in 1926. He thought he had deciphered
some of it, including an occurrence of "R.
Baconi" on the last page[1]. His "solution" has
been convincingly refuted by other scholars,
who however have not offered anything better.

I now rush in where angels fear to tread.
Although not a specialist in Old Norse, I am
convinced that the manuscript is a text
in fifteenth century Danish or Norwegian --
not a cipher, and not an artificial language,
as has also been suggested. For reasons too
complex to go into here, I have tentatively
ruled out Old East Norse (that is, Old Swedish)
and rejected altogether the second branch of Old
West Norse, Old Icelandic. The reasoning which
suggested Dano-Norwegian is given below.

Most of the manuscript has a depressing num-
ber of repeated words and phrases, of little
help unless collateral information is available,
suggesting that these are prayers, incantations,
or formulas of a specific character. This is

[1] The information in this paragraph and the
preceding paragraph was taken from *Horizon*,
January 1963 (Vol. V, No. 3). (UNCLASSIFIED)

SECRET HANDLE VIA COMINT CHANNELS ONLY

not the case, and the botanical drawings and naked figures are not helpful either. I therefore chose a mostly unadorned text without too many repeats (Folio 114 recto).

I then attempted to find "function" words, that is, connecting words such as conjunctions, personal pronouns, and prepositions, assuming (correctly, as it turned out) that the language would have these. The first item that caught my eye was **oẋ**, the second letter of which was a mystery. However, I thought the word might be "and" because of its frequent position between longer words which often had the same endings. Remembering *og*, "and," from Danish, I sought out phrases of the type "of mice and men" (Scandinavian literature, like that of Anglo-Saxon, contains many rhyming or alliterative phrases of this type). I was lucky: a phrase in the script form

ooℾ . . . oẋ . . .

occurred. The first is a general Scandinavian word for "from," "out of." This was promising, because not only did the first word appear to be in a known alphabet with the desired meaning, but the second letter of the second word was a tentative recovery ("g"). The same procedure has been of aid in establishing proper names, especially those occurring in pairs:

ℍor oẋ ℍⱴℍaıⱳ *Thor og Thruther*
"Thor and [his daughter] Thruther."

(This was an exciting find because, in my ignorance of Norse mythology, I had never heard of Thruther. An encyclopedia came to the rescue.)

Once a few phrases of this kind fall into place, the logical next step is to look for verb forms, and hope that verb affixes and bases of the desired type appear. Again, I was fortunate

in finding past-tense suffixes and a few high-frequency verbs common in Danish and Norwegian:

-ⱴ8a, -o8a

looked like regular past-tense forms *-ida*, *-oda*, and the verbs *rída*, "ride," and *gof*, "gave" seem solid.

From the above it will be clear that this is only a beginning. Spelling "variants" in the manuscript sometimes turn out to be different words and in any case cause difficulties (variant spellings of the same word are common, however, in manuscripts of most Germanic languages, and are not in themselves unexpected). The "letters" themselves are not all recovered, due in no small part to the use of digraphs, especially when short words like "and" and "of" are written as one with following words:

oℋoẋ *o(g)thog*, "although".

In other cases, vowel letters appear to be used to indicate that other contiguous vowel letters are "umlauted" (cf. English "man," singular; "men," plural).

The major difficulty, though, is the syntax. Human language is produced and understood in fairly long strings, but linguistic analysis has up to very recently concentrated on forms (i.e. morphology) and the reference texts I am using are no exception. This, together with that the fact that I have only had recourse to texts which concentrate on an older stage and another dialect of West Norse (Old Icelandic) has slowed progress. I am pretty sure, however, of the correctness of my basic diagnosis and will, I hope, be able to publish something more than this skimpy initial report.

DEPARTMENT OF GOLDEN OLDIES

HIDDEN LOSSES
IN
COMINT PRODUCTION
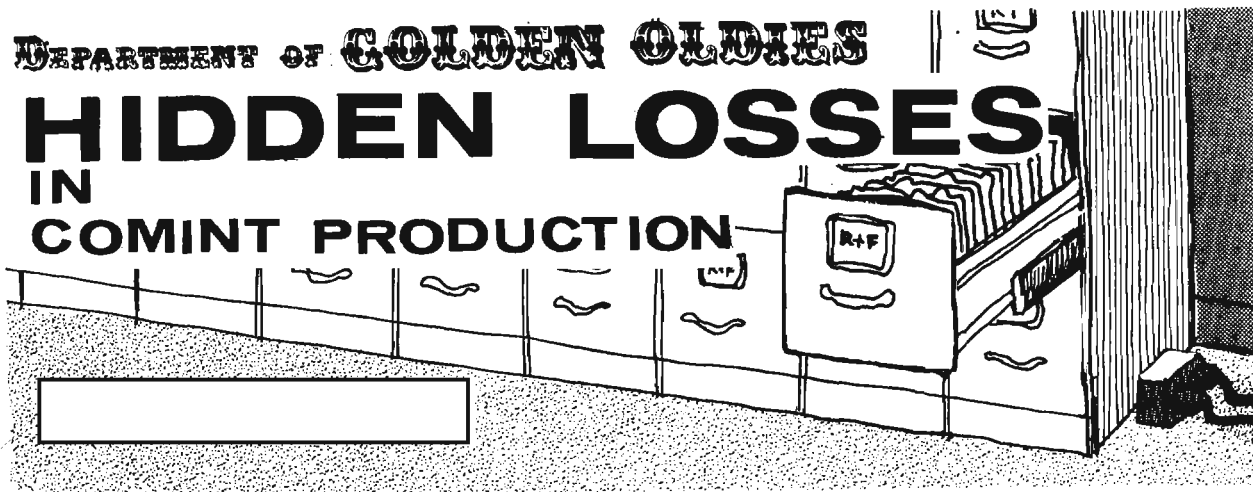
Most of the Golden Oldies published in CRYPTOLOG so far have been light in tone, but the Editor feels that this department should also reprint certain serious works that continue to remain "golden" and that readers may have missed when they were first published. One such work is the following article by retired NSA-er [   ] which was originally published in KEYWORD, June 1971.

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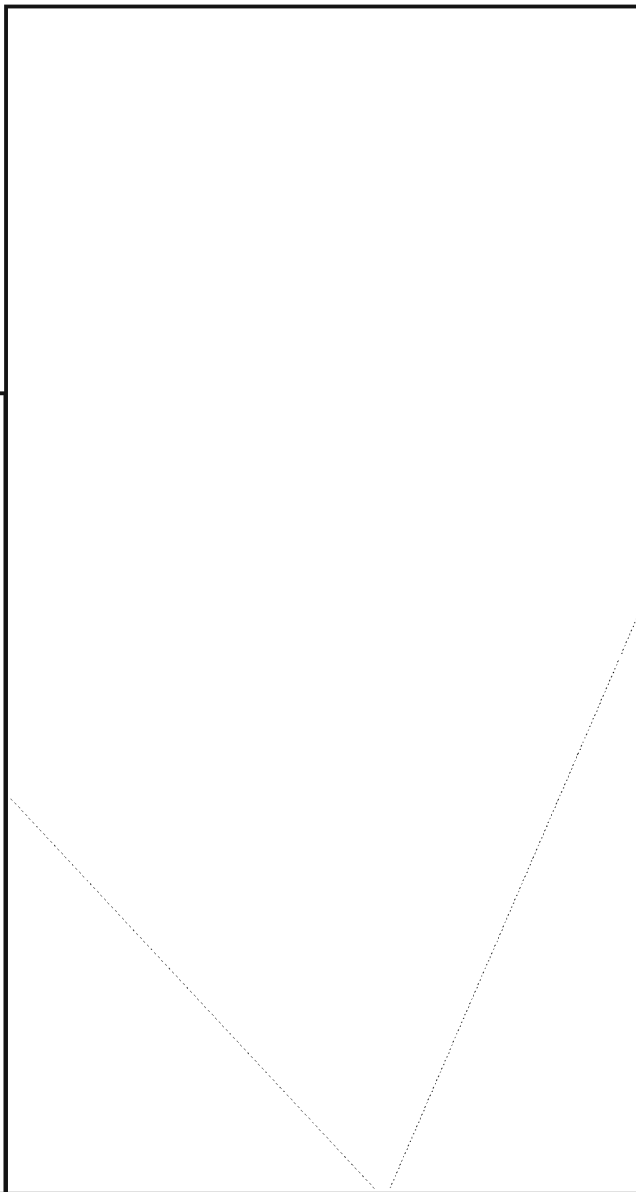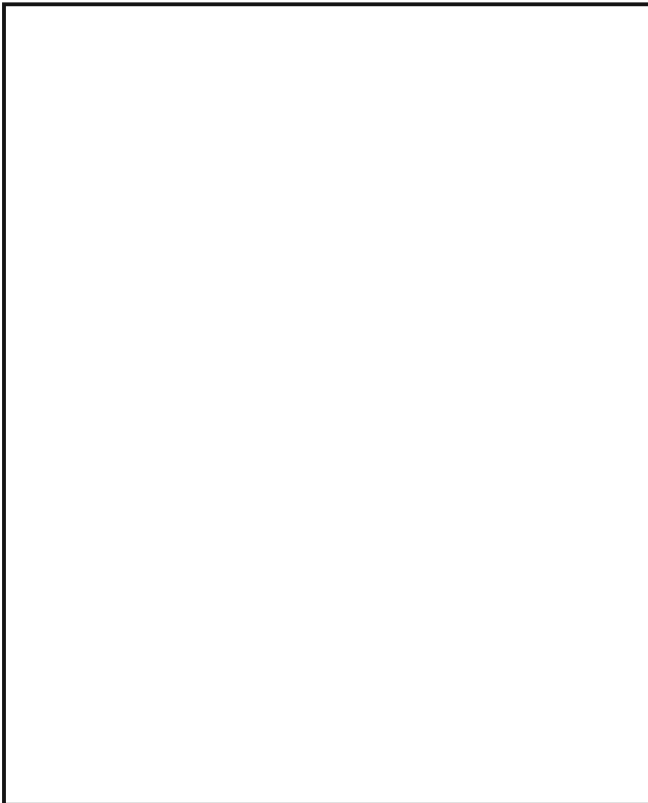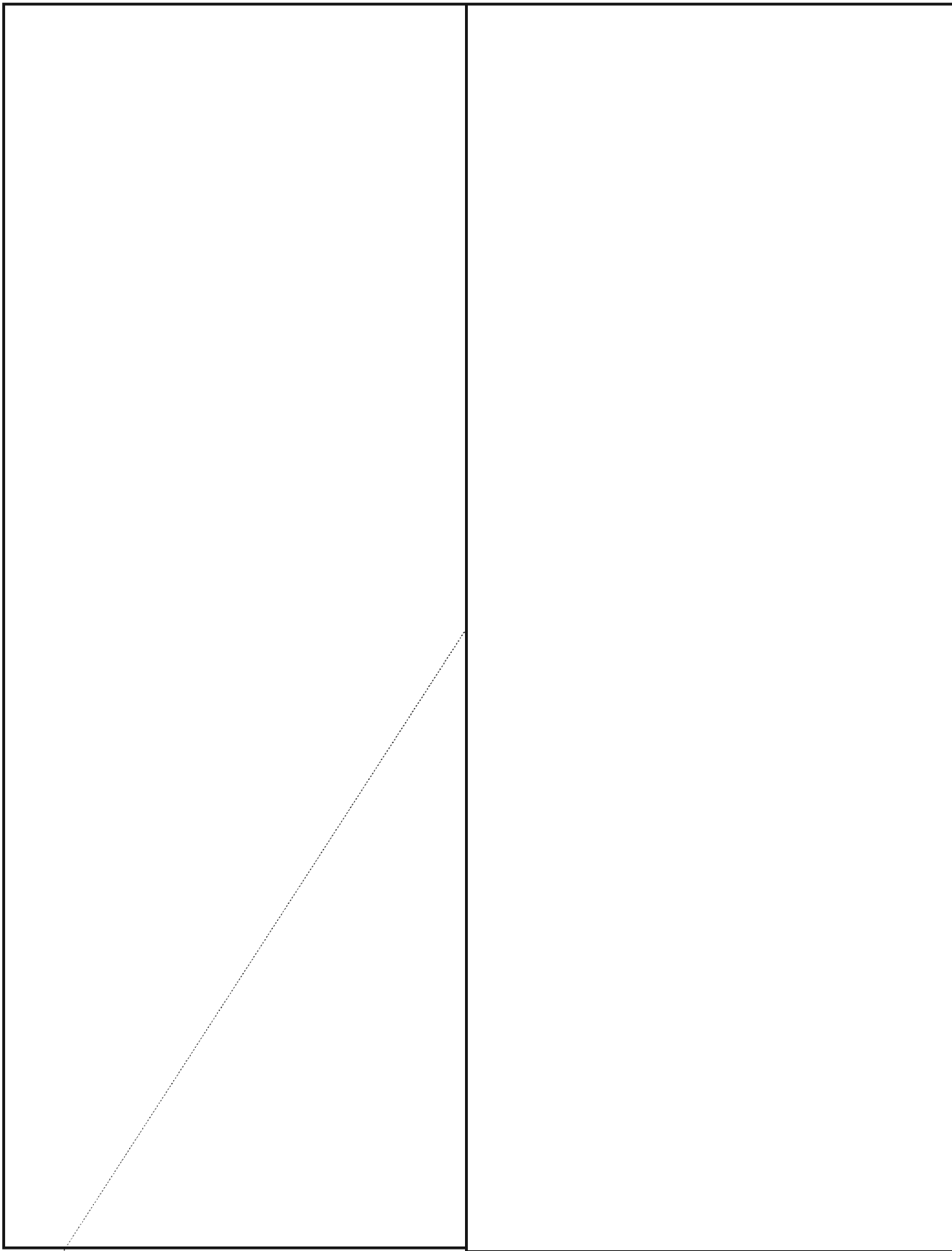
P.L. 86-36

LETTERS TO THE EDITOR
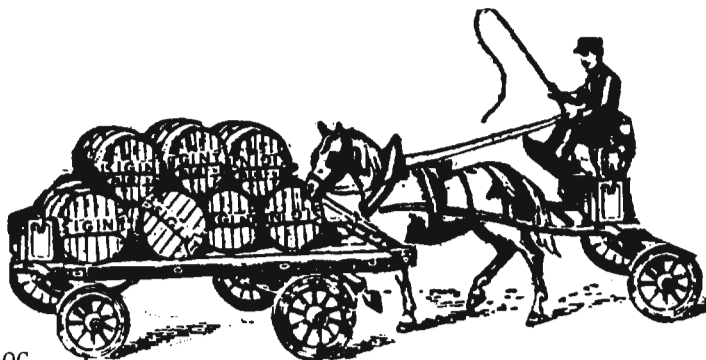
To the Editor, CRYPTOLOG:

After reading the December 1975 CRYPTOLOG article "What Are We About?", by [   ] I am compelled to comment.

Overall, the article was good food for thought. But one sentence in one paragraph prompted the following "tirade."

[   ] stated, "It follows that, if the processing and reporting effort ever catches up with the collection effort, we would be in real trouble because we would certainly have the cart before the horse."

I have shown the article to several people who were puzzled by that statement. Personally, I disagree with his philosophy although I sometimes think that the NSA/CSS and the Intelligence Community do not disagree. The philosophy that I would prefer to operate under is to *attempt* to keep pace with the collector in processing and analysis. Reporting of intelligence in a *selective* manner should follow, thus *not* inundating the user with reports he doesn't want or need.

P.L. 86-36
EO 1.4.(c)

To the Editor, CRYPTOLOG:

Thank you for the opportunity to comment on [redacted] comment on my short item which appeared in the December 1975 issue.
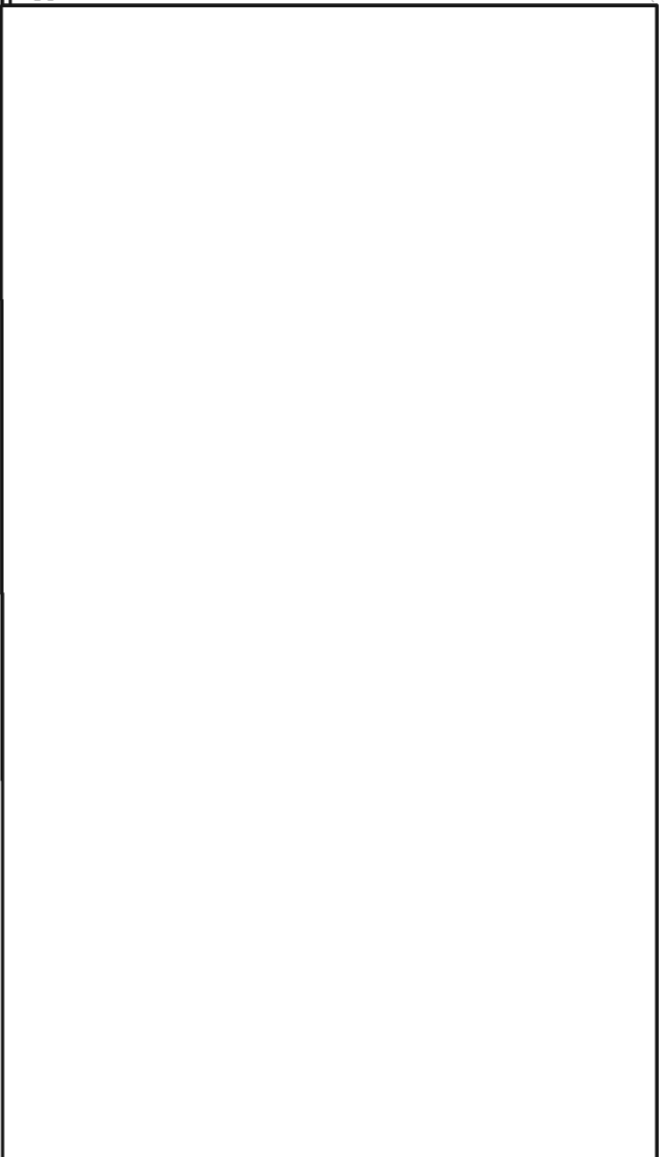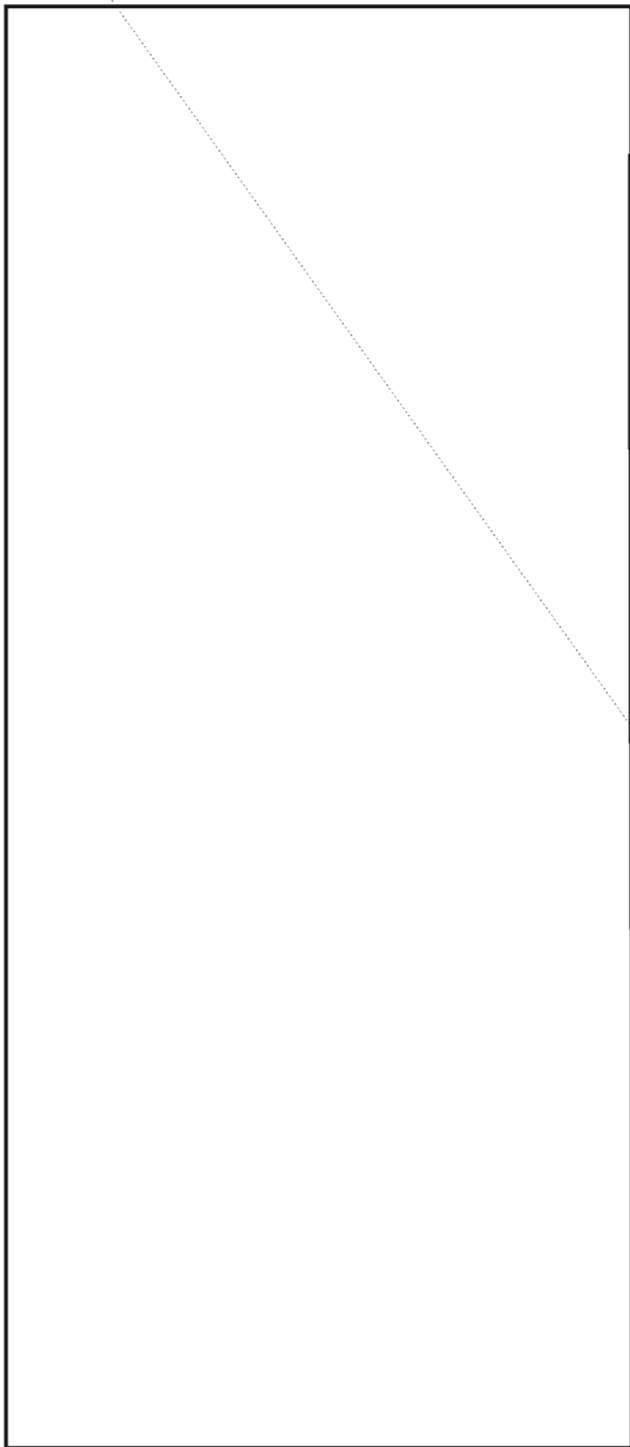
Remember the old motto, ". . . the impossible will take a little time."

[redacted] was asked whether he would care to comment on [redacted] letter to the editor. He replied as follows.

In conclusion, I appreciate the "old #2" problem. It is worrisome, but it steps beyond inventory and volume considerations into the realm of prioritization, and that approaches one of the theses of my article, i. e. inundation. From the maverick point of view, it seems to me that the "old #2" might well have been elevated to #1, if only temporarily, inasmuch as there is no substitute for the on-scene "judgment calls" of the person who happens to be attending the signal -- admittedly another generalization.

[redacted] D/Chief, A732
("a processing and reporting shop")

LANGUAGE IN THE NEWS

Language Rule Snags Fairfax

Wash. Post, 8 Dec 75 / Megan Rosenfeld, Washington Post Staff Writer

The Fairfax County school system may be in violation of federal civil rights guidelines for identifying children who do not speak English.

County schools may be required to spend $60,000 to achieve compliance and hire 30 new employees to interview children and their parents and administer language tests.

... members were need...

"We have about 26 languages represented in our school system," board chairman Mary Anne Lecos said in an interview. "We don't see how we can institute bilingual education without turning the entire school system upside down. And we don't see the point of following guidelines designed for bilingual education if we don't have it."

Currently, 2,754 of the county's 137,000 students speak foreign languages as their native tongue, with varying degrees of proficiency in English. The county provides a federally funded program to tutor those who need help in English.

The county has large groups of children who speak Spanish (764), Vietnamese (516) and Korean (497), as well as those who speak Arabic, Czech, Turkish, Hungarian and other languages. Some children speak several languages fluently.

Mrs. Lecos said the board asked its attorney to look into the legal aspects of the guidelines and the eventual possibility of filing a lawsuit to prevent the county from losing federal funds for failing to have bilingual education.

Moynihan, Soviet Trade Tough Talk

Wash. Post, 8 Feb 76

UNITED NATIONS, Feb. 8 (UPI) — Daniel Patrick Moynihan glared across the Security Council table at Soviet Ambassador Yakov Malik. He leaned forward in his chair and in measured tones told the Soviet:

"We are not intimidated. We are not afraid. We will not 'take care'.

"We do not give a damn!"

But it all turned out to be a misunderstanding, caused by a faulty translation of Malik's words.

"I never said 'take care'," Malik said. "I said 'take heed, gentlemen, you are the laughing stock of Africa.'"

Moynihan said his transcript bore the words, 'take care', but: "I ask forgiveness for what was a wholly unintended mistake."

The politeness that marked the end of Friday's Security Council session was absent from most of the verbal exchange between the two men...

Malik Says He Was Wrongly Translated In Moynihan Clash

NYT, 8 Feb 76

UNITED NATIONS, N.Y., Feb. 7 (UPI)—An apparent Soviet warning to the United States to "take care" touched off a strong outburst in the United Nations last night from the United States representative, Daniel P. Moynihan, but the Soviet representative said later that he really meant "take heed." Mr. Moynihan then asked for "forgiveness."

Mr. Moynihan had assailed the Soviet delegate, Yakov A. Malik, saying that Americans did not "give a damn" about threats from Moscow.

But Mr. Malik later said that his remarks had been mistranslated by the United Nations interpreter.

"I never said 'take care'," he said. "I said, 'Take heed, gentlemen, you are the laughing stock of Africa.' I would like to assert that my Russian word cannot be translated 'beware' or 'take care.' It means 'take heed.' A source with access to the text said Mr. Malik had used the word "opomnites," which can be translated roughly as "come to your senses."

Mr. Moynihan said he had obtained a transcript in which the English translation had Mr. Malik saying "take care"...

... OR AT ANY OTHER CORNER YOU WANT!

... at the corner of your desk (if it's private enough), the corner of the cafeteria, the corner of the parking lot, you name it. . .

PURPOSE: To discuss that hard-hitting article you've been wanting to write for CRYPTOLOG, but which you'd like to have published anonymously.

At various times, people have mentioned to members of the Editorial Board that certain articles "should be written," and those persons wouldn't mind writing the articles themselves, except for various personal reasons -- official position, friendship with NSA coworkers, etc.

According to our publication charter, CRYPTOLOG can print anonymous articles, so long as the Editor knows the identity of the author. If you wish, you may submit the article, unsigned, through the Agency mail, and then, by telephone or other appropriate "Pssst!", identify yourself to the Editor as its author. Or, before actually writing the article, you may wish to discuss the idea with the Editor.

In either instance, do not actually drop in on the Editor in his office. He doesn't really have an office, but shares space with several other NSA-ers, any one of whom would be more than willing to TA the situation and blat out anything they suspect.

So if you have an article a-brewing about a controversial topic, get in touch with me discreetly. I'll do everything to preserve your anonymity while offering to the NSA reading public your ideas on things that "have to be said."

CRYPTOLOG Editor
P16, Room 3C099-1, 5642s

(UNCLASSIFIED)
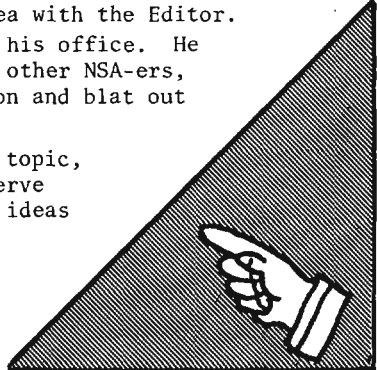
NSA-CROSTIC NO. 3

BY A.J.S.

> The quotation on the next page was taken from a published work of an NSA-er. The first letters of the WORDS spell out the author's name and the title of the work.

DEFINITIONS

WORDS

A. Russian poet (1814-1841)

$\overline{102}$ $\overline{25}$ $\overline{213}$ $\overline{73}$ $\overline{56}$ $\overline{200}$ $\overline{65}$ $\overline{137}$ $\overline{31}$

B. Athenian tragic poet (525-456 B.C.)

$\overline{20}$ $\overline{45}$ $\overline{88}$ $\overline{130}$ $\overline{34}$ $\overline{195}$ $\overline{37}$ $\overline{12}$ $\overline{201}$

C. Groucho's straightperson (2 wds)

$\overline{85}$ $\overline{7}$ $\overline{91}$ $\overline{93}$ $\overline{116}$ $\overline{57}$ $\overline{79}$ $\overline{40}$ $\overline{121}$ $\overline{67}$ $\overline{181}$ $\overline{119}$ $\overline{132}$

$\overline{100}$

D. Yeomen of the Guard

$\overline{44}$ $\overline{3}$ $\overline{32}$ $\overline{171}$ $\overline{87}$ $\overline{14}$ $\overline{167}$ $\overline{113}$ $\overline{143}$ $\overline{218}$

E. Gentle reminder given by Ivan to his wife (she had been arguing with Rudol'f Rudol'fovich, party functionary, about whether it was snow, slush, or whatever) (6 wds; based on song title)

$\overline{183}$ $\overline{156}$ $\overline{135}$ $\overline{82}$ $\overline{211}$ $\overline{66}$ $\overline{141}$ $\overline{205}$ $\overline{115}$ $\overline{68}$ $\overline{202}$ $\overline{26}$ $\overline{97}$

$\overline{125}$ $\overline{144}$ $\overline{52}$ $\overline{109}$ $\overline{165}$ $\overline{152}$ $\overline{1}$ $\overline{58}$ $\overline{149}$ $\overline{92}$ $\overline{186}$ $\overline{191}$

F. Nazi concentration camp in Poland (Germ. sp. Auschwitz)

$\overline{155}$ $\overline{193}$ $\overline{107}$ $\overline{22}$ $\overline{206}$ $\overline{11}$ $\overline{59}$ $\overline{209}$

G. Confiscate

$\overline{168}$ $\overline{127}$ $\overline{18}$ $\overline{41}$ $\overline{146}$ $\overline{188}$ $\overline{69}$ $\overline{182}$ $\overline{8}$

H. Name of W. C. Fields' "son" on radio (until the sponsor -- Lucky Strike -- got wise)

$\overline{46}$ $\overline{178}$ $\overline{203}$ $\overline{129}$ $\overline{27}$ $\overline{192}$ $\overline{117}$

I. Forever

$\overline{53}$ $\overline{114}$ $\overline{217}$

J. Italian mathematician (c. 1170-1230) (1, 2, 3, 5, 8, 13, 21. . .) (2 wds)

$\overline{21}$ $\overline{169}$ $\overline{74}$ $\overline{148}$ $\overline{212}$ $\overline{94}$ $\overline{133}$ $\overline{101}$ $\overline{2}$ $\overline{210}$ $\overline{55}$ $\overline{194}$ $\overline{60}$

$\overline{180}$ $\overline{198}$ $\overline{185}$ $\overline{216}$

K. Poison gas

$\overline{16}$ $\overline{61}$ $\overline{122}$ $\overline{51}$ $\overline{207}$ $\overline{86}$ $\overline{9}$ $\overline{140}$

L. Island taken by U.S. Marines (Feb-Mar 1945)

$\overline{208}$ $\overline{89}$ $\overline{172}$

M. Unit of beauty sufficient to launch one Greek ship

$\overline{104}$ $\overline{164}$ $\overline{13}$ $\overline{120}$ $\overline{35}$ $\overline{70}$ $\overline{96}$ $\overline{83}$ $\overline{179}$ $\overline{161}$

N. Marked by stateliness or magnificence

$\overline{47}$ $\overline{197}$ $\overline{29}$ $\overline{19}$ $\overline{54}$ $\overline{215}$

O. Patron of exploration (1394-1460) (3 wds)

$\overline{142}$ $\overline{4}$ $\overline{176}$ $\overline{15}$ $\overline{105}$ $\overline{33}$ $\overline{126}$ $\overline{38}$ $\overline{187}$ $\overline{128}$ $\overline{112}$ $\overline{162}$ $\overline{62}$

$\overline{199}$ $\overline{136}$ $\overline{28}$ $\overline{75}$

P. Word used to express discomfort, aversion, or impatience

$\overline{196}$ $\overline{48}$ $\overline{154}$

Q. Gay (obs)

$\overline{98}$ $\overline{158}$ $\overline{150}$ $\overline{118}$ $\overline{123}$

R. Defendants

$\overline{42}$ $\overline{71}$ $\overline{184}$

S. Patronymic prefix in Irish names

$\overline{190}$

UNCLASSIFIED

T. Fault

$\overline{49}\ \overline{189}\ \overline{214}\ \overline{23}\ \overline{138}$

U. Word seldom heard in political speeches since Spiro's departure

$\overline{95}\ \overline{163}\ \overline{110}\ \overline{76}\ \overline{170}\ \overline{84}$

V. Dialect of Akan

$\overline{77}\ \overline{151}\ \overline{10}$

W. An article not needed by "the *hoi polloi*"

$\overline{204}\ \overline{159}\ \overline{50}$

X. Play by O'Neill (*The Hairy ---*)

$\overline{108}\ \overline{64}\ \overline{43}$

Y. Members of one of the great divisions of Islam

$\overline{153}\ \overline{78}\ \overline{111}\ \overline{24}\ \overline{174}\ \overline{103}\ \overline{36}$

Z. Kind

$\overline{177}\ \overline{17}\ \overline{6}\ \overline{124}$

Z_1. Show the minimal reaction (1970's usage)

$\overline{173}\ \overline{106}\ \overline{131}\ \overline{72}\ \overline{157}\ \overline{90}\ \overline{147}\ \overline{39}\ \overline{81}$

Z_2. Japanese lyric drama

$\overline{145}\ \overline{175}\ \overline{139}$

Z_3. Falling sickness

$\overline{160}\ \overline{80}\ \overline{30}\ \overline{5}\ \overline{134}\ \overline{99}\ \overline{166}\ \overline{63}$

1-E	▓	2-J	3-D	4-O	5-Z_3	▓	6-Z	7-C	8-G	9-K	10-V	11-F	12-B	13-M	14-D
15-O	16-K	17-Z	▓	18-G	19-N	20-B	21-J	22-F	23-T	24-Y	25-A	26-E	▓	27-H	28-O
▓	29-N	30-Z_3	31-A	32-D	▓	33-O	34-B	35-M	36-Y	▓	37-B	38-O	39-Z_1	40-C	41-G
42-R	43-X	▓	44-D	45-B	46-H	47-N	48-P	49-T	50-W	▓	51-K	▓	52-E	53-I	54-N
▓	55-J	56-A	57-C	58-E	▓	59-F	60-J	▓	61-K	62-O	63-Z_3	64-X	65-A	▓	66-E
67-C	68-E	69-G	70-M	71-R	72-Z_1	73-A	74-J	75-O	76 U	▓	77-V	78-Y	79-C	▓	80-Z_3
81-Z_1	82-E	83-M	84-U	85-C	86-K	87-D	88-B	▓	89-L	90-Z_1	91-C	92-E	▓	93-C	94-J
95-U	96-M	97-E	98-Q	▓	99-Z_3	100-C	101-J	102-A	103-Y	104-M	105-O	▓	106-Z_1	▓	107-F
108-X	109-E	▓	110-O	111-Y	112-O	113-D	▓	114-I	115-E	116-C	117-H	118-Q	▓	119-C	120-M
121-C	▓	122-K	123-Q	124-Z	125-E	▓	126-O	127-G	▓	128-O	129-H	130-B	131-Z_1	132-C	133-J
134-Z_3	135-E	▓	136-O	137-A	▓	138-T	139-Z_2	140-K	▓	141-E	142-O	143-D	144-E	145-Z_2	146-G
▓	147-Z_1	148-J	149-E	▓	150-Q	▓	151-V	152-E	153-Y	▓	154-P	155-F	156-E	157-Z_1	▓
158-Q	159-W	160-Z_3	161-M	▓	162-O	▓	163-U	164-M	165-E	166-Z_3	167-D	▓	168-G	169-J	170-U
▓	171-D	172-L	173-Z_1	174-Y	▓	175-Z_2	176-O	▓	177-Z	178-H	179-M	▓	180-J	181-C	182-G
183-E	184-R	185-J	186-E	187-O	▓	188-G	189-T	190-S	191-E	192-H	▓	193-F	194-J	▓	195-B
196-P	197-N	▓	198-J	199-O	200-A	▓	201-B	202-E	203-H	▓	204-W	205-E	206-F	▓	207-K
208-L	209-F	210-J	211-E	212-J	213-A	214-T	215-N	216-J	217-I	218-D	▓	▓	▓	▓	A.J.S.

(Solution will appear next month.)

UNCLASSIFIED

HOW DO ADULTS LEARN LANGUAGE?

A923
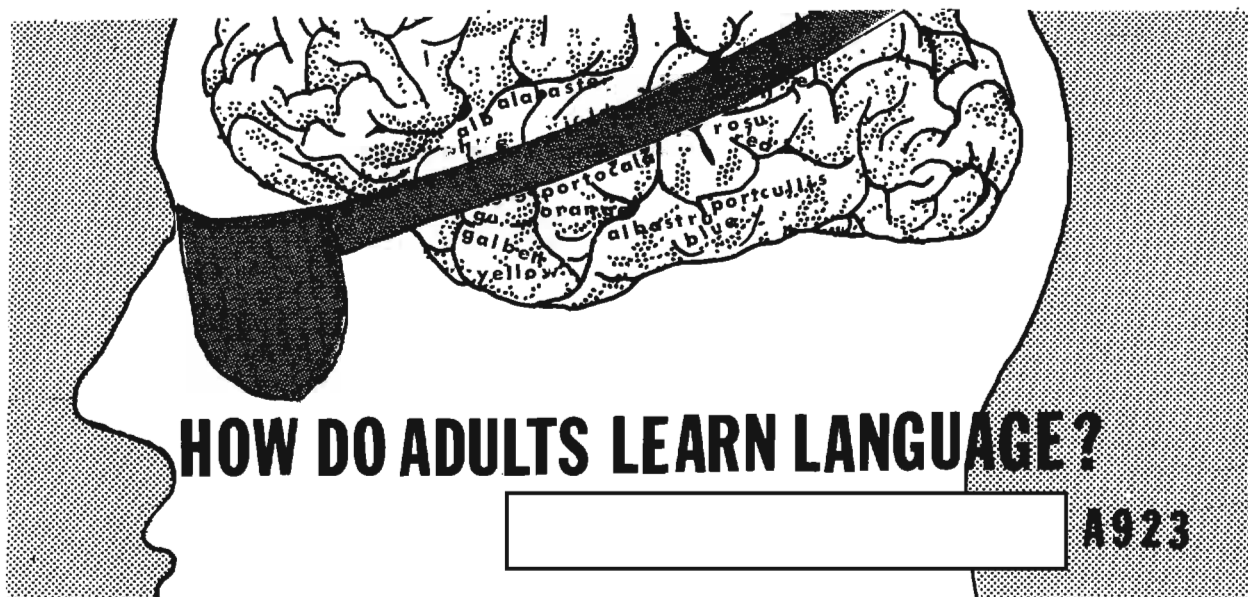
P.L. 86-36

Why do adults have such a hard time learning a foreign language when it's so easy for a 5-year-old child to learn his own language, or even two languages at the same time? Why do older children -- such as those in junior high school, where most Americans make their first attempt to learn a foreign language -- also have difficulty in assimilating a second language? The author of the following article finds the answers to these questions in an understanding of the physiological development and functioning of the human brain.

Many psycholinguists agree that learning a second language after the age of 12 or 13 years is extremely difficult for most people. Since it is generally accepted, and rather obvious, that children easily master any one of the 5,000 languages of the world, psycholinguists have assumed that there must be certain characteristics of language which, coupled with some type of physiological brain function, enable children to develop a language capability, if not spontaneously then certainly with great speed and ease. If we assume that, in these 5,000 languages, there is a common base structure that remains basically constant, we may further assume that it is the psychophysiological functions of the human brain proper that present problems when learning a second language as an adult.

Several theories and explanations have been advanced concerning second-language learning. Many of them have overlapping features and hypotheses. But the consensus is that small children learn language by using both hemispheres of the brain and that, after the onset of puberty, the language and speech functions are transferred to the left hemisphere only.

This is suggested because damage to the right hemisphere in an adult rarely results in language or speech disorders.

It would appear then that the learning of a second language after the age of 13 years would pose serious problems not encountered when learning one's maternal language. The problems would include:

- the lack of dual hemispheric capability;
- the tendency to interpret the second learned language through the structure, sounds, and patterns of the primary language; and
- the phenomenon of bilingual interference (confusing elements and patterns of one language with similar but not directly transferrable elements of another language in a seemingly spontaneous manner).

But, one may ask, to what degree would these problems affect second-language proficiency? Does hemispheric dominance indeed play a major role in second-language acquisition? Which hemisphere of the brain "controls" language acquisition and competency in the adult?

If current psycholinguistic theories are correct, it is only an extremely rare individual who can attain native or near-native proficiency in an acquired second language. (There most certainly are truly bilingual persons throughout the world, but virtually all learned both languages as children or, as adults, have displayed exceptional aptitude for language acquisition.) This article describes an attempt to explore experimentally on a very limited scale the questions of second-language proficiency in order to draw some conclusions concerning the inferred concept of "an extremely rare individual" and dual language competency.

Romanian, a language spoken by a relatively small number of persons in the United States, was selected as the test language in order to reduce the likelihood that the test subjects had heard or acquired the language prior to the age of 13 years. A random group of nine persons participated in the testing. All had begun studying Romanian as a second language after age 18. The average length of time they had studied the language prior to the testing was 4 years 8 months. All the persons tested had received basically the same language training, at the same school, under similar conditions. The test group consisted of both males and females, and both right-handed and left-handed persons. It was unbelievably fortunate to find two left-handed Romanian linguists, and even more improbable to select them from a group of 25 possible subjects. Truly left-handed persons tend to have a dominant right hemisphere for language and speech functions, whereas right-handed persons are generally left-hemisphere dominant.

The two devices used in the testing were modified from previously carried out experiments to evaluate specific language tasks and functions and to identify the roles and properties of the brain hemispheres in each instance. Visual stimuli were used in the testing.

The first test was an adaptation of the Stroop (1963) color reading-identification experiment. A number of white cards were prepared, each bearing the Romanian name of a color. Different colors of ink were used, so that no word was written in the color denoted by the word, e. g. the Romanian word for "blue," *albastru,* was written in green ink; the word for "red," *roşu,* was written in blue ink; etc. The subject was told to look at the word on the card and translate it into English orally as quickly as possible. The group was then tested for their speed in recognizing each Romanian word and their accuracy in translating it into English. As a control, a similar number of white cards were prepared using the same Romanian words written only in black ink (the normal black-on-white medium). The cards were flashed at a rapid and constant rate.

The results showed that considerably more time was needed to "read" the color and accurately translate from the multicolored cards than from the black-on-white cards. The average time for eight responses was 9.7 seconds, with a 92 percent accuracy rating for the colored cards.

The control cards presented an easier task. Accuracy jumped to 100 percent and the recognition time was reduced to 5 seconds.

After the test, each person was interviewed regarding his or her feelings and thoughts while taking the test. Six of the nine readily admitted confusing the word meaning with the color in which it was written. All said they

first saw the word, visualized the color it denoted, associated it with the English word, and then produced the English word. One person gave the color of the ink in Romanian, paused a split second, and then translated the ink color into English -- a correct translation but an incorrect response.

In this case there was clear evidence of simple bilingual interference and, in the color test overall, it was at least partially demonstrated that, although the subjects could be accurate in their responses if given sufficient time, they lacked the spontaneity of a native, fluent speaker. It also very probably shows how those people tested were "bound" to interpret color through the experiences and prior perceptions in their maternal language (and perhaps culture).

In attempting to isolate one brain hemisphere, it was necessary to devise an experiment that could block one side of the brain while allowing input to the other side. Audio inputs are transferred to both sides of the brain. Visual inputs, however, can be isolated.

Visual stimuli are transmitted via the optic nerves, crossed to opposite hemispheres, and sent to the right and left visual cortex. Perhaps this can be more clearly explained by describing the action of one eye only.

The right eye has its field of vision divided into three basic elements: right field of vision, point of fixation, and left field of vision. Objects perceived in the right-eye *right* field of vision are eventually received in the *left* visual cortex (left hemisphere), and objects perceived in the right-eye *left* field of vision are received in the *right* visual cortex.

If one wants to isolate a particular visual image in one specific hemisphere of the brain, this can be done by placing the image in one field of vision only and blocking or covering the other eye. Thus, if one wants to "feed" a visual image to the dominant side side of the brain for right-handed persons, the image should be placed in the right-eye right field of vision, with the left eye closed.

In the normal right-handed person, the left hemisphere contains the speech, language, and visual association and interpretation areas. If, indeed, second language learned after puberty is colocated with the original maternal language, then testing of the weak, non-dominant, non-language specialization hemisphere should yield low language competency and performance. Conversely, testing of the dominant side should show competency of a degree.

A test was devised to evaluate each hemisphere for language location and second-language colocation. A number of white cards, each bearing a short, simple, basic Romanian word, were prepared. Some words were nouns, others

verbs, but in equal numbers. All nine persons had readily translated all the words as part of a 250-word control text that they had been asked to translate two days prior to the testing.

For the testing, the subjects were instructed to stare at a spot affixed to a wall approximately 10 feet away, while covering their left eye. Thus, the visual images, the words in Romanian, were "fed" to the left hemisphere for all subjects.

As each word was flashed on the spot on the wall, each subject was asked to perceive it and translate it into English, or, if he was unable to perceive the word as a meaningful Romanian word, to state the letter or letters he had seen.

Seven words were presented to the left hemisphere of all subjects, yielding the following results:

Subject	Number correct out of 7 words
1	4
2	6
3	1
4	4
5	7
6	5
7	4
8	6
9	1

It is obvious that subjects 3 and 9 did considerably worse than the rest of the group. However, these two persons turned out to be left-handed. Apparently their left hemisphere did not function well in language and speech problems. These two subjects also complained that, although they could easily see the card and the letters on that card, they could not get the meaning of the words.

The group was then subjected to a test to probe the opposite side of the brain -- the right hemisphere, which is not normally associated with language functions in the adult. Under identical test conditions, a new set of Romanian words was flashed to all subjects with the right eye covered. These results were:

Subject	Number correct out of 7 words
1	1
2	0
3	5
4	1
5	1
6	1
7	0
8	1
9	6

In this test, the left-handers (subjects 3 and 9) did far better than the right-handers, and, moreover, zipped through the words with surprising speed. Virtually all the right-handed subjects complained of not being able to comprehend the word even though they could "physically see" the card and the letters. One right-hander remarked that he could see the entire word but still did not know what it was. Another spelled the three-letter Romanian word but could not perceive it as a meaningful word.

In another instance, the Romanian verb *merge*, "to go," was translated into English as "yield." Apparently this subject (a right-hander), who normally has no difficulty in translating the Romanian verb correctly, could do no better under these conditions than to associate it with the English word "merge" and mistranslate it by another English word seen in related traffic situations.

Many of the subjects could identify only the first and last letter of the word. All seemed frustrated, if not surprised, at their inability to translate simple three- and four-letter words. Even the allegedly "best" linguists, including some professionals, were duly humbled by this simple test.

This part of the experiment clearly located the area of the brain for Romanian learned as an adult -- in the respective hemisphere both for the right-handed and for the left-handed subjects. There was only a very marginal amount of Romanian in the weak, non-dominant side of the brain. Since this testing had no fixed time limit, it may be surmised that those weak-side correct responses -- which in fact took fairly long periods of time to produce -- were the result of a slow associative process that involved some type of data transfer between hemispheres via the splenium.

If anything, these experiments tend to support the consensus that language competency -- especially in a second language -- is located in the dominant side of the brain and thus colocated with the maternal language. It also shows a shift from one side to the other depending on which hand is the dominant one.

To sum up, then, when answering the questions "Does hemispheric dominance play a major role in second-language acquisition?" and "Does language learning as an adult present unique problems?" we must answer both questions with a categorical "Yes."

Can we locate the residence of second language in the brain? Again we can answer "Yes," but not as emphatically.

And, finally, we may answer the question of language competency by saying that there is little hope of attaining native fluency or competency when only one hemisphere is used in the language-learning process. At best, an adult may hope to acquire sufficient language items and sufficient exposure to the foreign culture to compensate for any learning deficiencies and psycholinguistic limitations.

EO 1.4.(c)
P.L. 86-36

COMPUTER-AIDED TRANSCRIPTION

P.L. 86-36
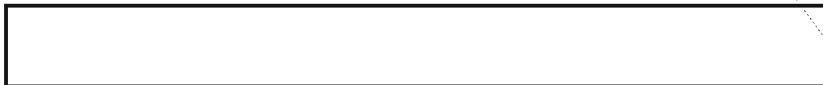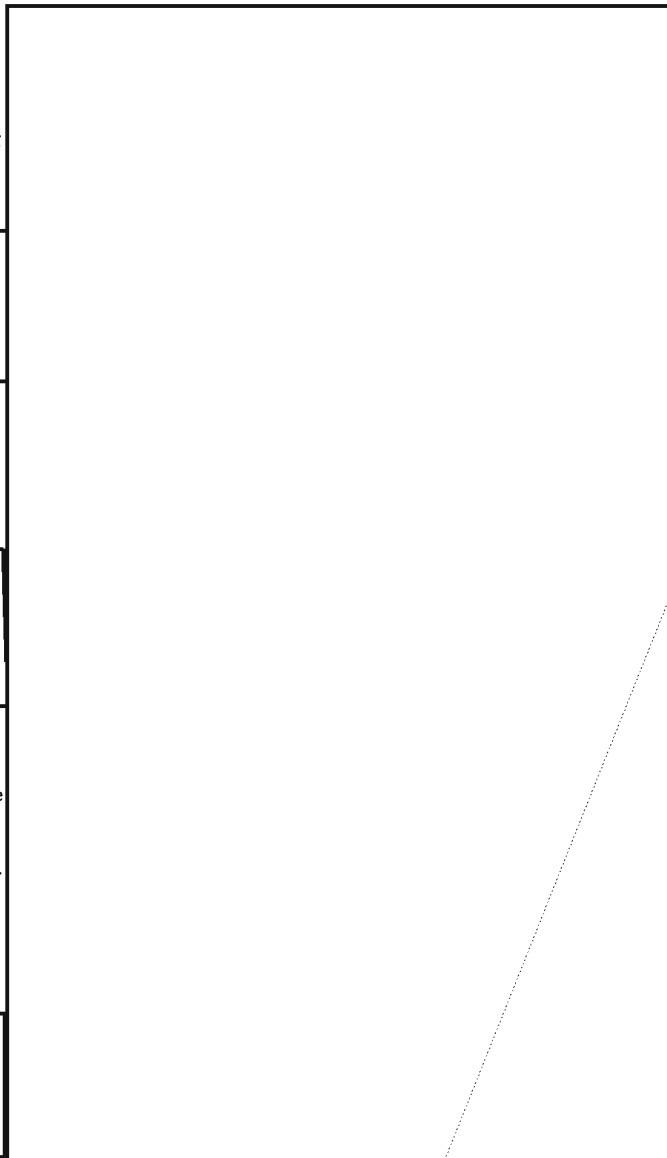
P.L. 86-36
EO 1.4.(c)

Introduction

Skeptics have long ago, and very convincingly, put down the notion that the computer is going to replace the linguist at NSA, or indeed anywhere else. However, a great deal of thought is going into designing ways in which the computer can *aid* the linguist. In this article I would like to describe a project currently underway
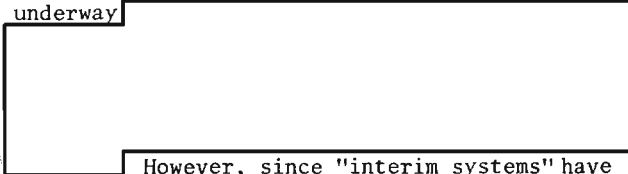
However, since "interim systems" have the tiresome habit of hanging around long after their predicted demise, I shall not even speak of the future or of greater glories yet to come. Instead I shall deal only with the very real present.

A wish was born to free transcribers from as many clerical or nonlinguistic functions as possible and at the same time make the fruits of the transcription effort available to other transcribers and to analysts on an on-line basis. The wish eventually became father to the deed in the form of [   ] a computer-aided transcription system. The need to generalize the software for "exporting" to other transcription problems, and the overriding need to provide the intelligence data gleaned from transcription to the intelligence community as a whole
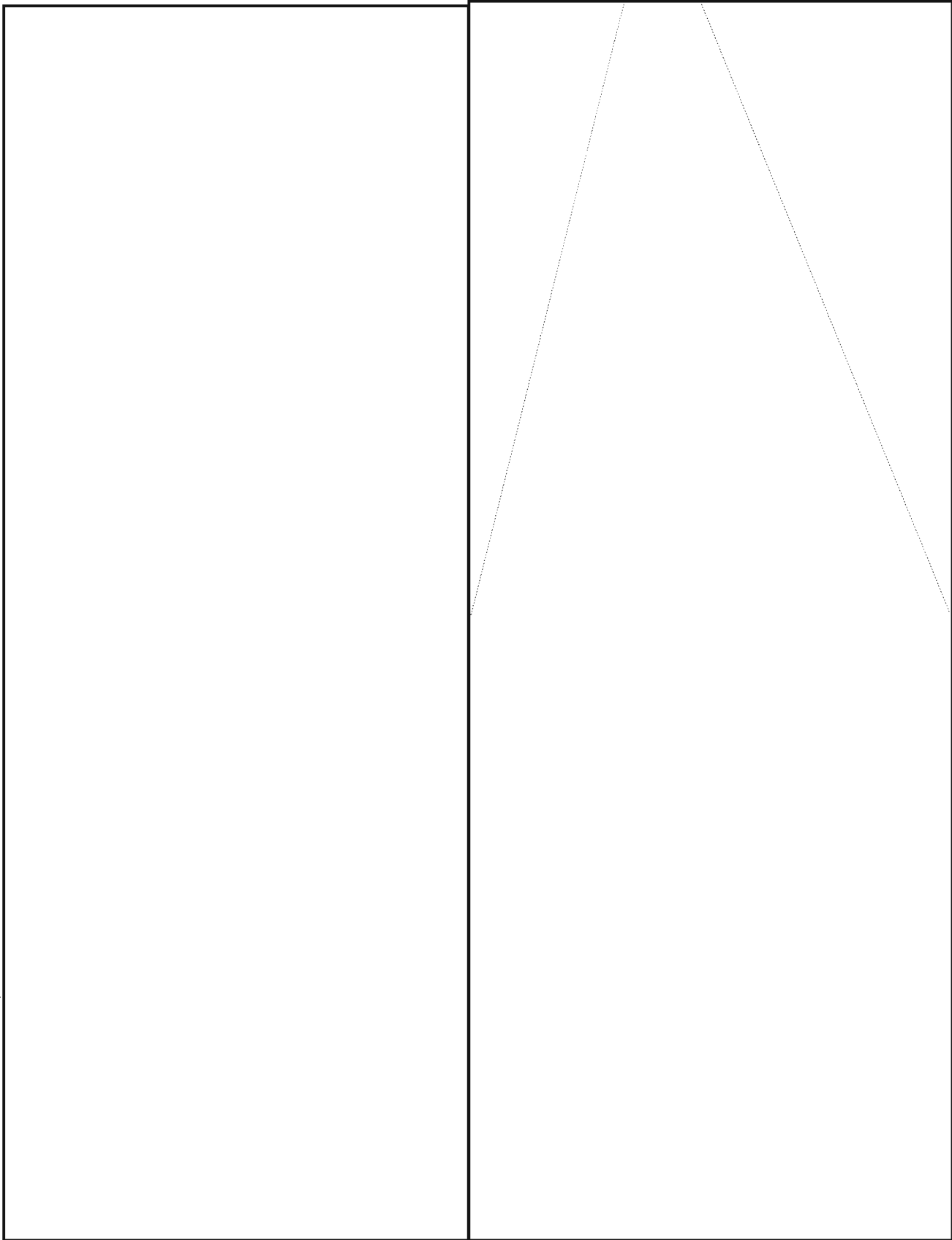
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EO 1.4.(c)

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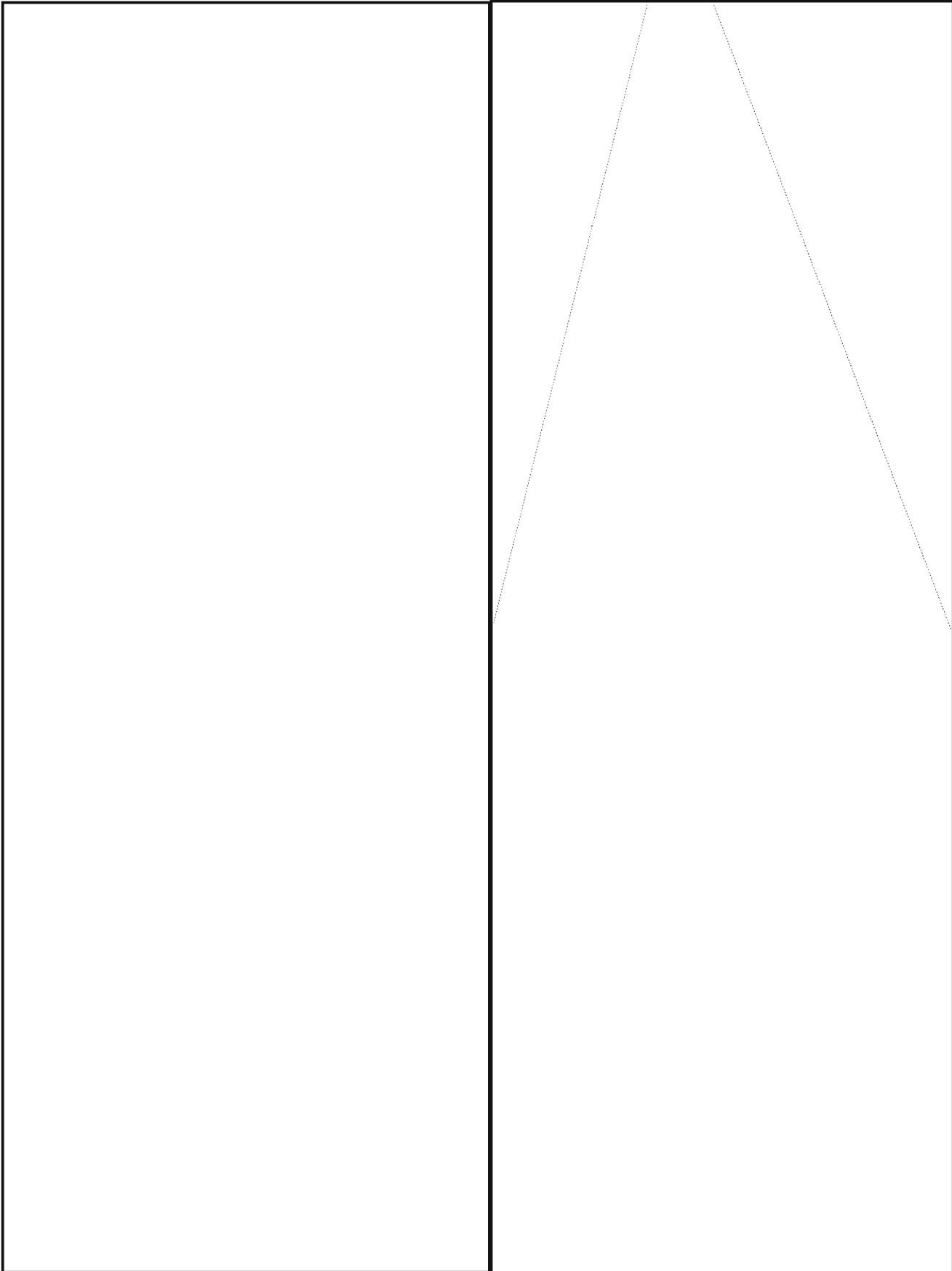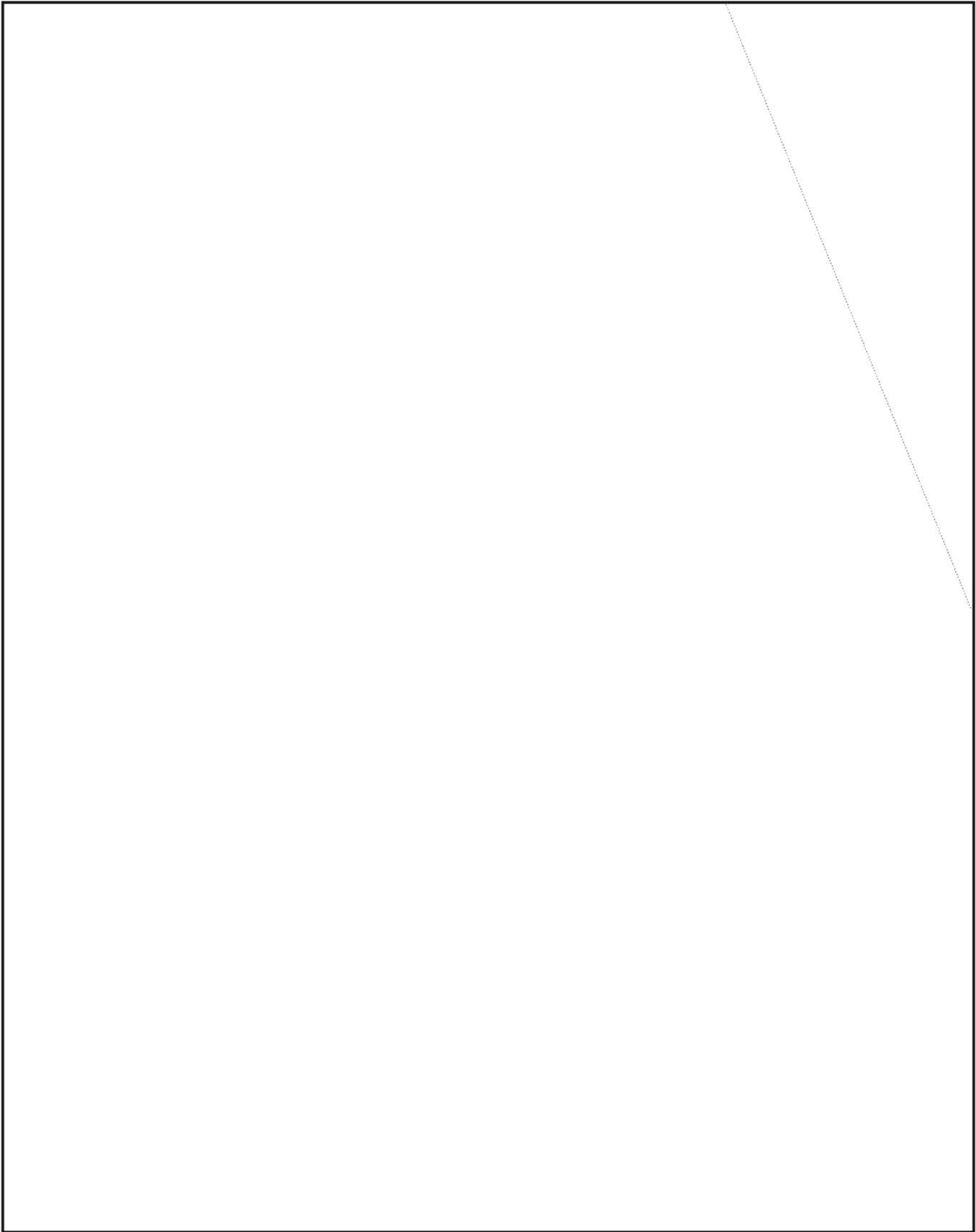EO 1.4.(c)
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EO 1.4.(c)

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EO 1.4.(c)

SECRET SPOKE

SECRET SPOKE
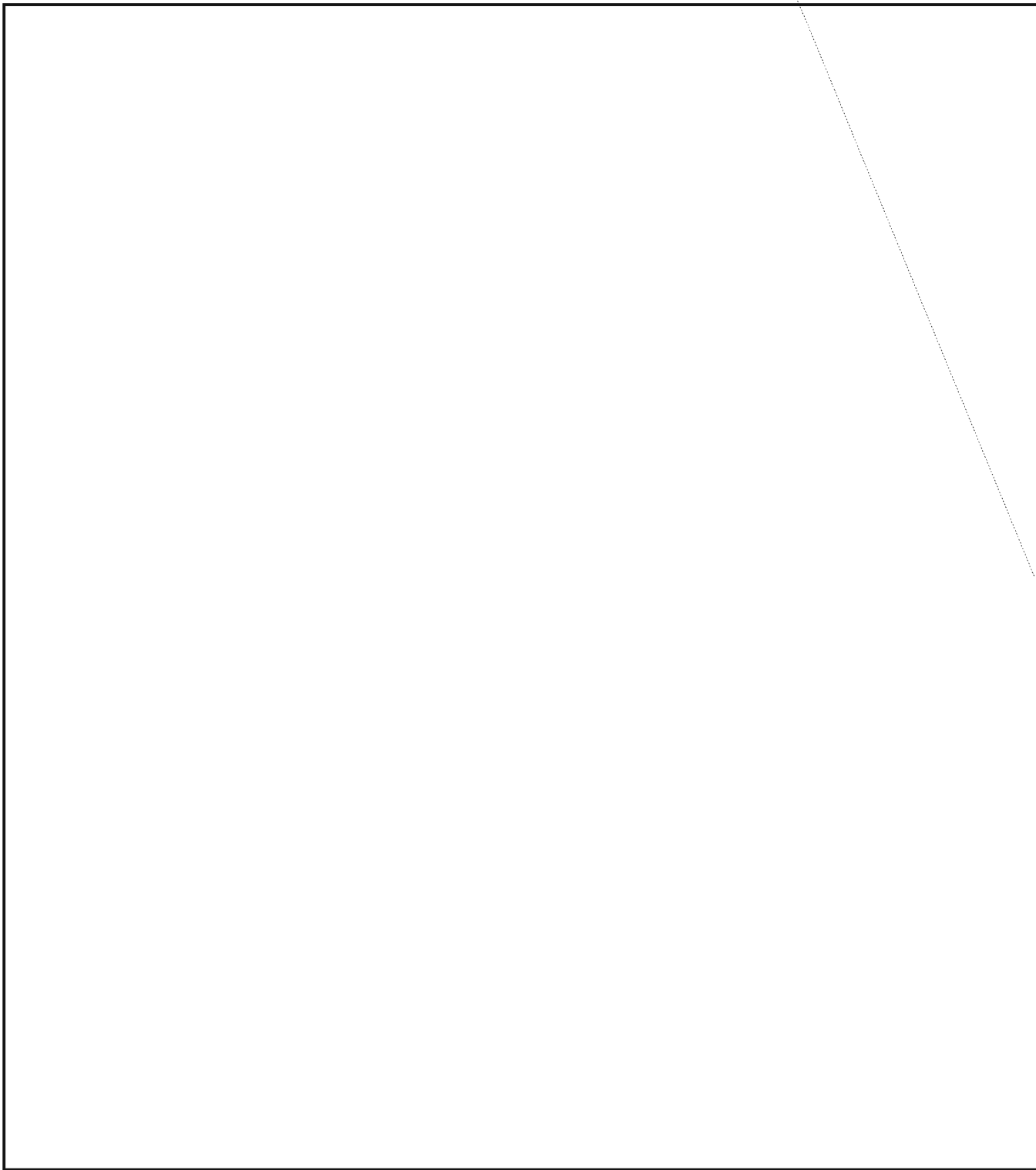
CLARIFICATION OF ANNOUNCEMENT OF NCS
Course-Equivalency Tests

The November 1975 issue of CRYPTOLOG contained an annoucement issued by the National Cryptologic School concerning Course-Equivalency tests. The announcement, with a list of courses, read:

The National Cryptologic School offers employees the opportunity to earn course credit by taking EQUIVALENCY TESTS. Frequently, through experience or self-study, a person has already learned the material presented in a course. If this knowledge can be demonstrated, time and energy required to take a course can be saved. Equivalency tests may be scheduled through the cognizant NCS department. . . A grade of "P" is assigned for passing the course through an equivalency test. Grades of "F" are not recorded. Aspirants may take the test only once.

The announcement elicited the following comment to the editor from ⬚

CRYPTOLOG seems to be leading field personnel down a primrose path, as regards the article on NCS Course Equivalency Tests. In the future, please flag those courses which are available to NSA/CSS Ft. Meade area assignees only. For example, I am told by E23 that course equivalency tests for the EA-200 series courses are not available outside of NCS. Would be interested in knowing how many other courses/equivalency tests listed in the article are not available to field personnel.

The editor was pleased to be able to relay this comment to NCS and is equally pleased to print the School's clarification, as follows:

Please thank ⬚ for bringing up the issue of equivalency testing in the field. Many NCS tests can indeed be taken in the field, but some which require a laboratory exercise cannot. E23 has agreed that if the field station can make the necessary equipment available and will provide a qualified signals analyst to oversee the laboratory testing, the department will, on an individual basis, arrange to send the test to the field station. E23 will also make the effort to modify tests to accommodate personnel assigned to stations that do not have the currently stated required equipment.

The following list of tests is annotated to show the field testing arrangements. The list is followed by instructions for requesting a test.

*EA-010	Introduction to SIGINT Technology
*EA-030	Introduction to Multichannel Technology
*EA-100	Basic SIGINT Technology
***EA-200	SIGINT Instrumentation and Measurement Techniques

(Continued)

***EA-201	Communications Signals Measurements and Analysis Techniques
***EA-202	ELINT Measurement and Analysis Techniques

Cognizant department: E23

ED-210	Tests and Measurements

Cognizant department: E42

*ET-100	Introduction to Electronics
ET-260	Solid State Devices and Applications
ET-261	Digital Concepts

Cognizant department: E24

*MA-400	Introduction to Computer Science Mathematics

*MP-154	Introduction to Computer Systems Operation
*MP-1B5	CDC 6600 Series System Software (SCOPE)
*MP-1B6	CDC 6600 Advanced Technical Skills (SCOPE)
*MP-1C5	UNIVAC 494 RYE System Software
*MP-1C6	UNIVAC 494 Advanced Technical Skills
*MP-1D6	IBM 360/370 Advanced Technical Skills OS
*MP-1E5	UNIVAC 1108 System Software
*MP-1E6	UNIVAC 1108 Advanced Technical Skills
*MP-1G5	Project HOLDER - UNIVAC 494 Systems Software
*MP-1H5	Burroughs 6700 System Software
*MP-1H6	Burroughs 6700 Advanced Technical Skills
*MP-1K5	CDC 7600 System Software (IDA)
*MP-1K6	CDC 7600 Advanced Technical Skills (IDA)
*MP-1S5	Introduction to IBM 370 MVS Operating System
*MP-166	FORTRAN for Operators

Above 15 courses constitute the Operator Paraprofessional Program. Person must be in program and must have adhered to proper course sequence.

**MP-160	Introduction to Computer Science (Bypass test available to satisfy prerequisites for other courses. Course-equivalency credit requires toy problem using a Turing machine computer.)
**MP-188	APL Programming (requires APL terminal)
**MP-227	FORTRAN Programming
**MP-230	COBOL Programming

(Continued)

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**MP-242 PL/1 Programming
**MP-243 Burroughs Extended ALGOL Programming
**MP-248 BETA Programming (requires BETA
compiler)
**MP-267 POGOL Programming (requires POGOL
compiler)
**MP-335 IBM 370 Programming
**MP-368 IBM 370 Job Control Language (JCL)
**MP-375 PDP-11 Programming

Cognizant department: E21

*TA-200 Intermediate Traffic Analysis and
Technical Reporting
*TA-261 Computer Aid to Traffic Analysis
TA-361 Air Defense Technology and Traffic
Analysis

Cognizant department: E14

*IS-250 SIGINT Reporting
*TG-126 Target Studies - Mainland Southeast Asia

Cognizant department: E12

Key: * - Available in field.
** - Available in field -- toy problem
also required.
*** - Available in field -- laboratory
required.

*INSTRUCTIONS FOR REQUESTING AN
EQUIVALENCY TEST IN THE FIELD:*

To request an equivalency test, write to
NCS, Registrar, E71. Identify the course and
summarize your previous training and experi-
ence in the subject.

If a laboratory is required, give the name
of the qualified professional who will oversee
your performance. For MP courses, identify the
equipment that is available to you.

Tests will be sent to the Test Control
Officer at your station for administration,
after which they will be returned to NCS.

KEEP DOING IT TILL YOU GET IT RIGHT!

EDITOR

[ ] P12, has an idea
that's fresh as a

DAISY
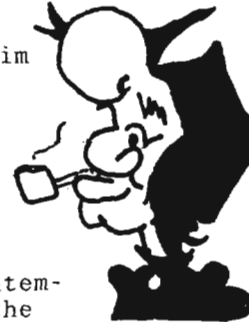
He suggests that readers of
CRYPTOLOG

MAY

want to share with him
their memories

AND

rare documents for a

LI'L

ole article he's contem-
plating writing on the

ABNER

computer that was used at Arlington
Hall Station.

*If you have any information to
share with Russ, please call him
on 5868s or visit him at 3C089.*

(FOUO)

A cache of uncirculated copies of the fol-
lowing publications, in the quantities indica-
ted, recently turned up. If any reader of
CRYPTOLOG would like to receive a copy of any
or all of them, please call [ ] P16,
Room 3W076, 4998s.

Collected Papers on Cryptanalytic Diagnosis,
Introduction by [ ] papers
by Callimahos, [ ] Douglas,
[ ] Jacobs,
[ ] Penney, Tiltman, and [ ]
NSA, April 1969, TOP SECRET CODEWORD,
S-194,074. (23 copies)

An Introduction to Teleprinter Key Analysis,
Lambros D. Callimahos. NSA, 1968.
Technical Literature Series: Monograph
No. 15. CONFIDENTIAL. (5 copies)

*Ars Conjectandi: The Fundamentals of
Cryptodiagnosis,* Lambros D. Callimahos.
NSA, 1970. Technical Literature Series:
Monograph No. 18. SECRET. (2 copies)

(FOUO)
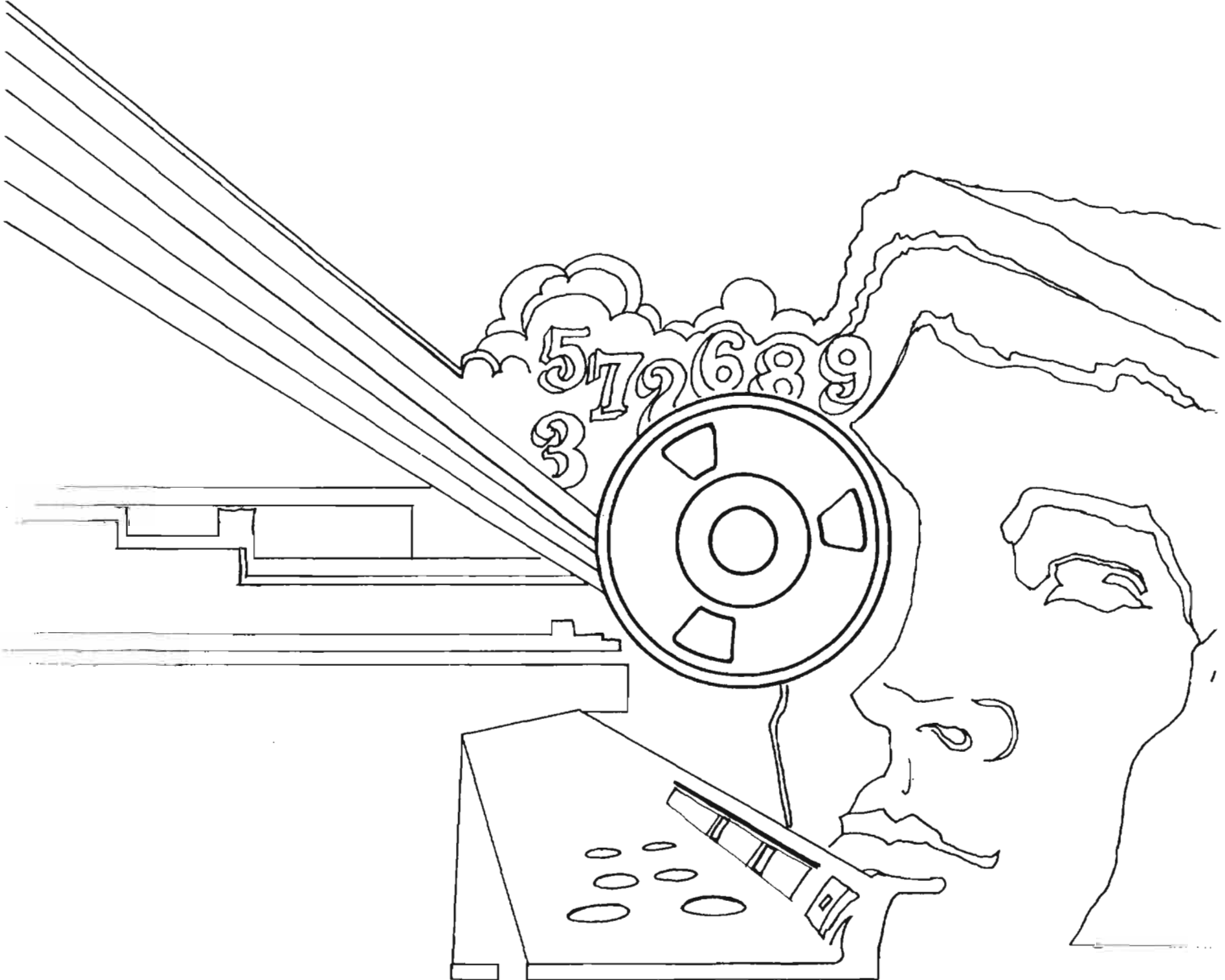
~~TOP SECRET~~

~~THIS DOCUMENT CONTAINS CODEWORD MATERIAL~~

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