

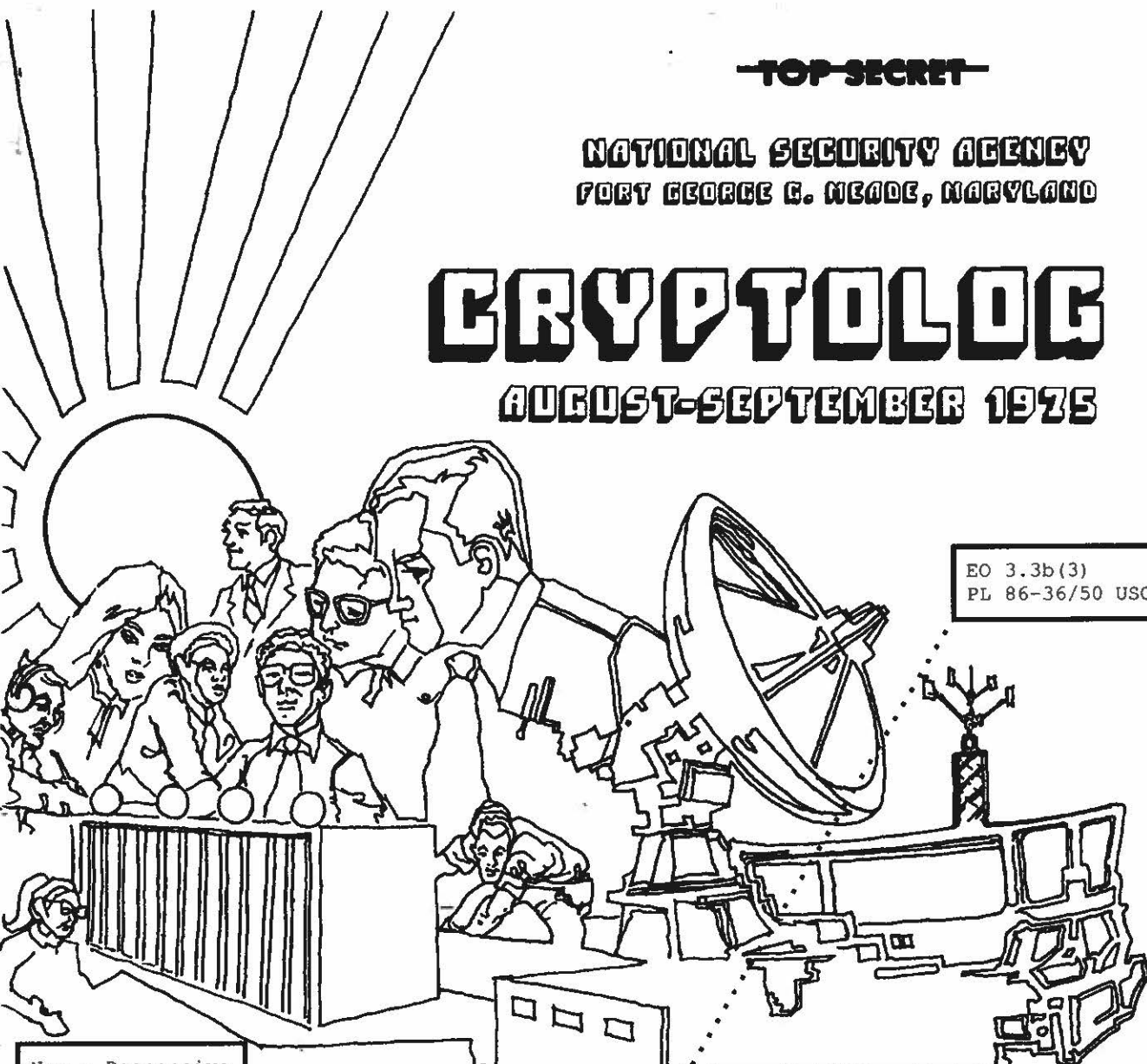
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NATIONAL SECURITY AGENCY  
FORT GEORGE G. MEADE, MARYLAND

# CRYPTOLOG

AUGUST-SEPTEMBER 1975

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PL 86-36/50 USC 3605



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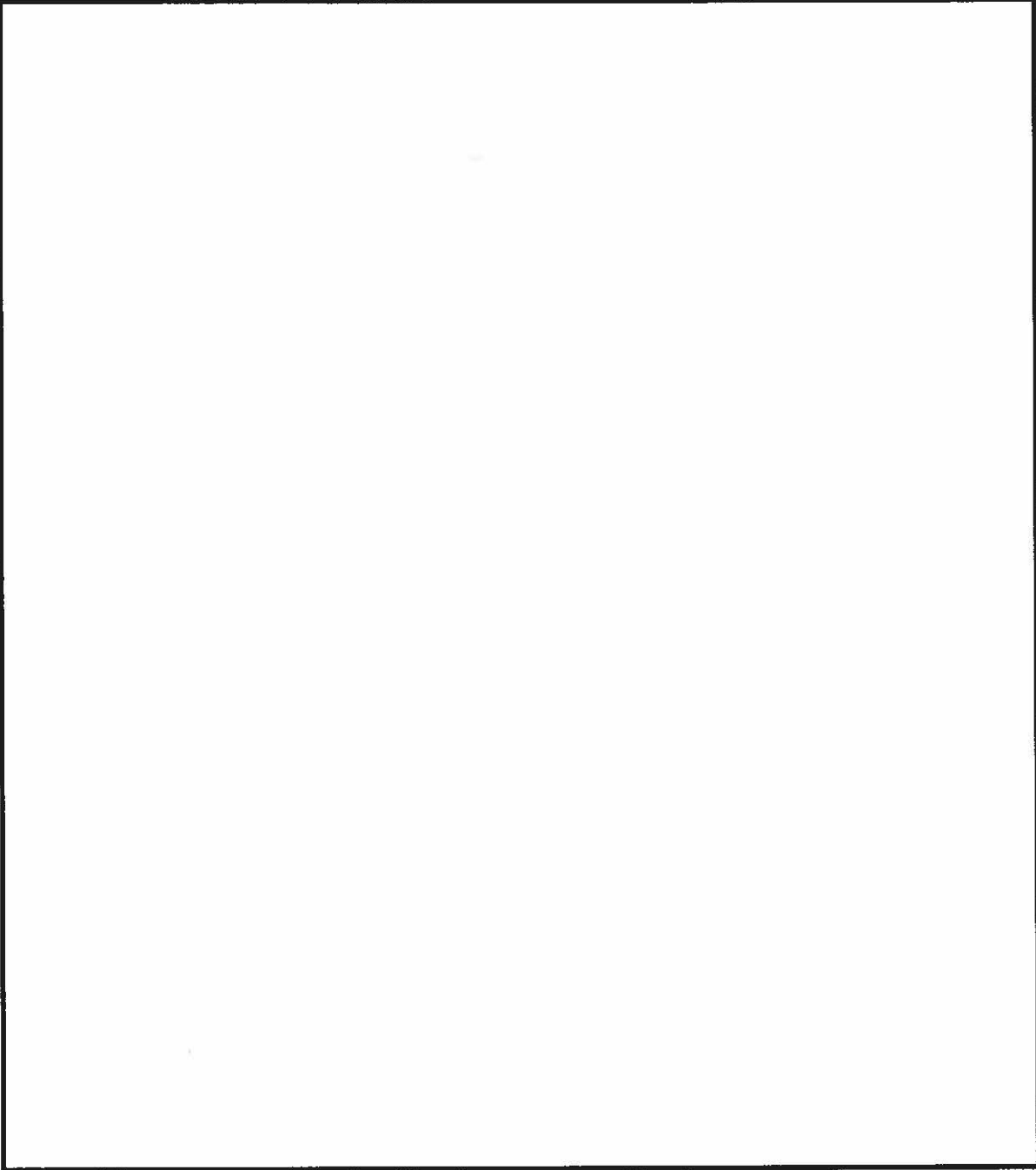
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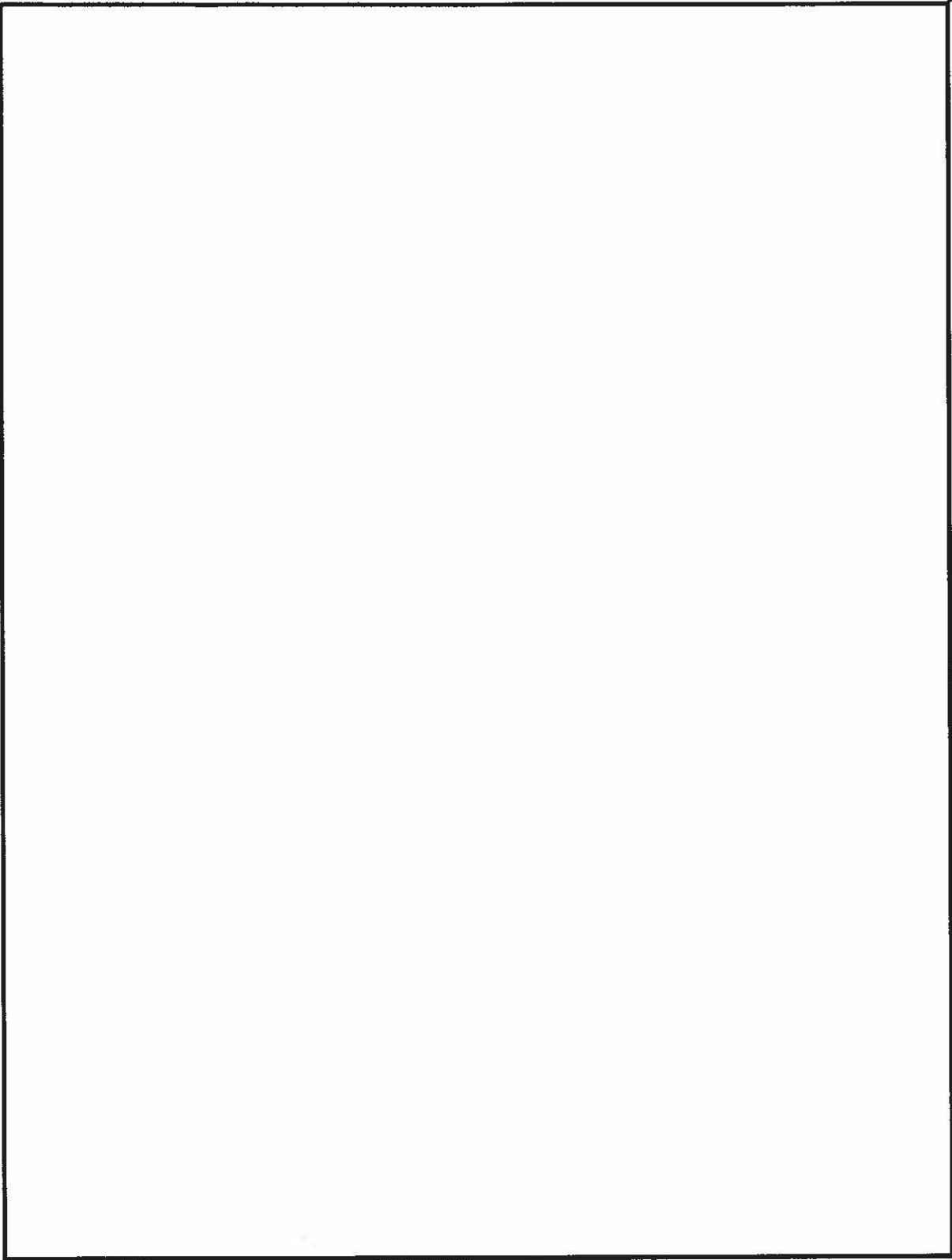
**20 YEARS OF TRANSPOSITION**  
**Jane Dunn, E1**

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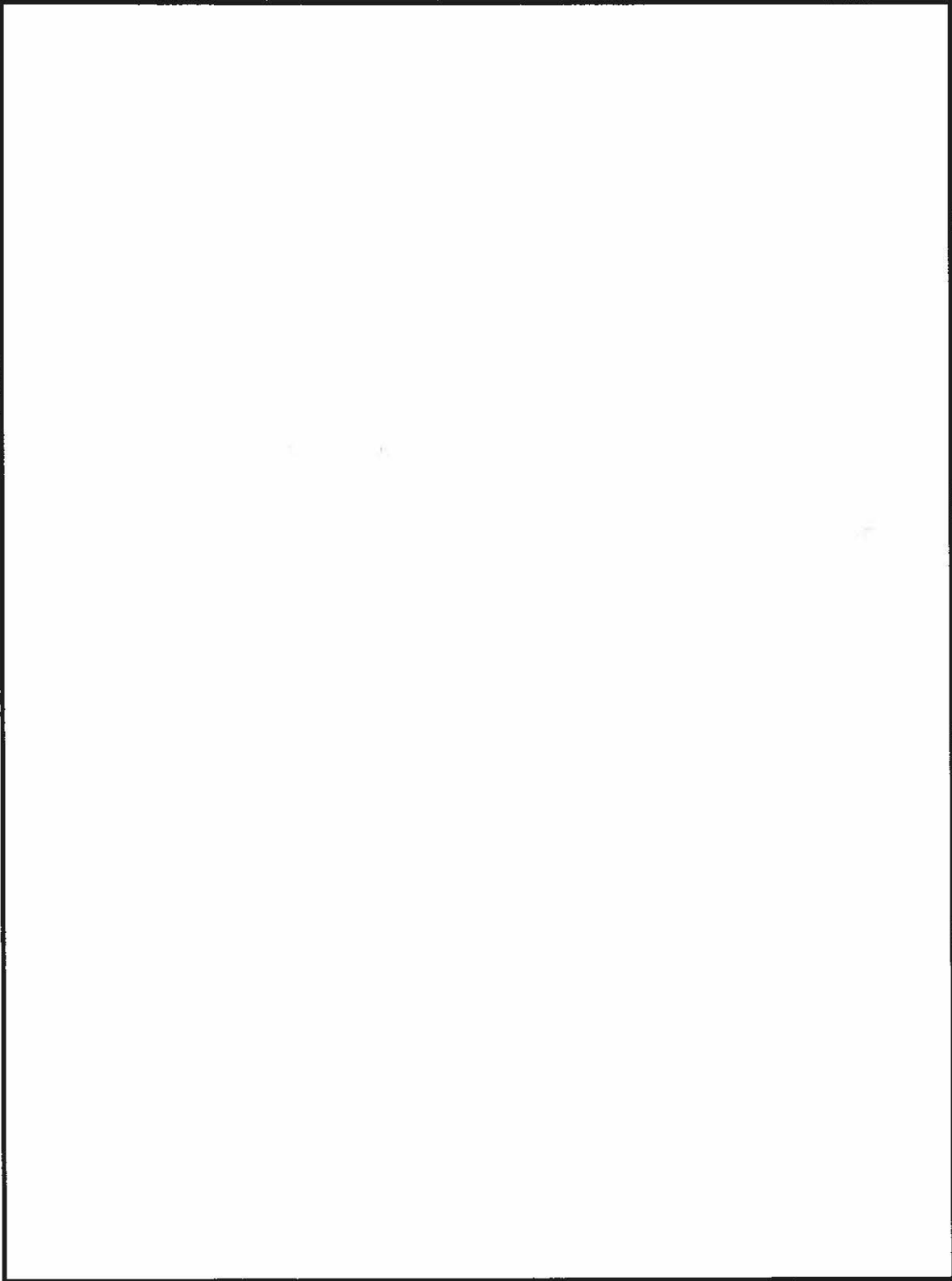


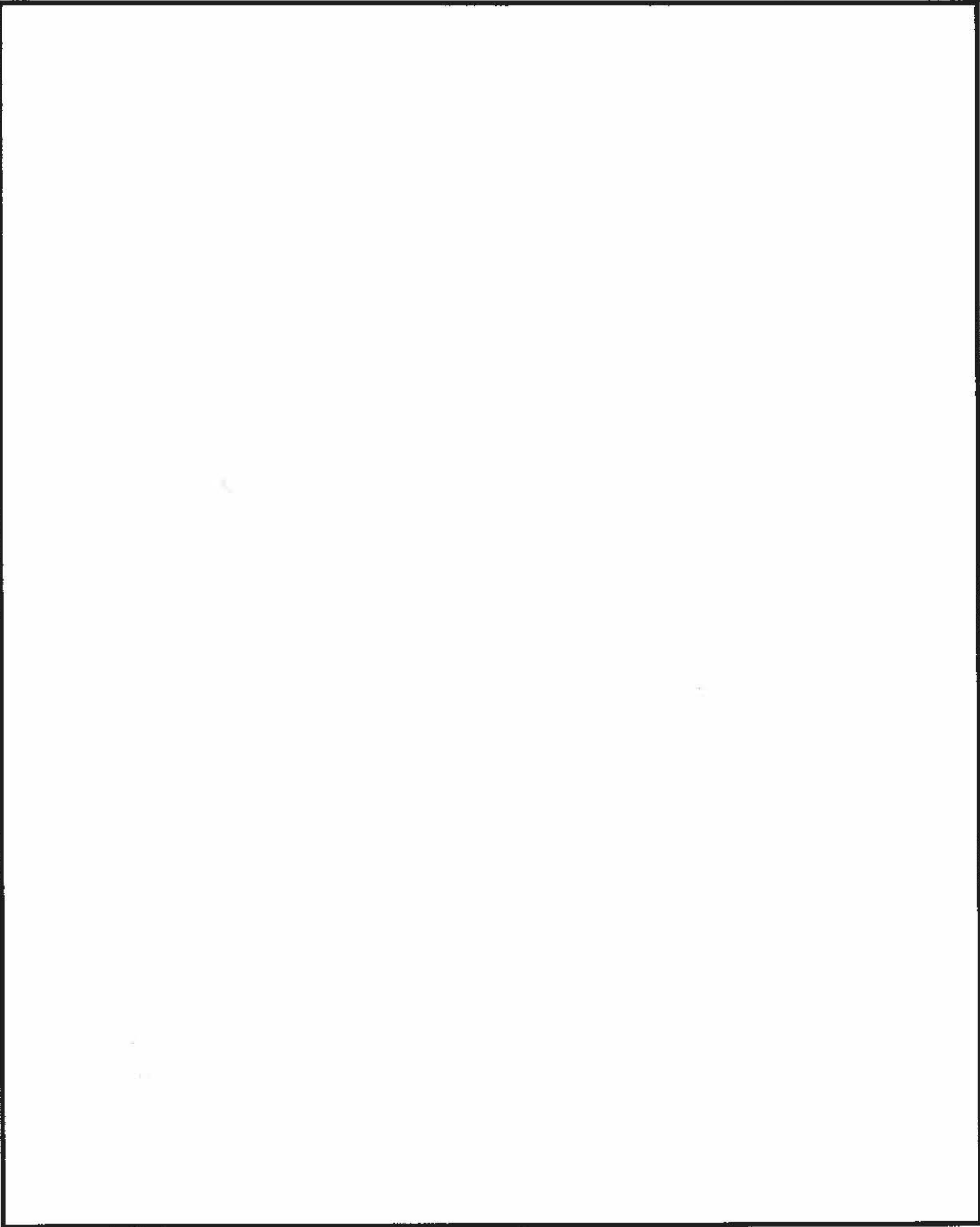
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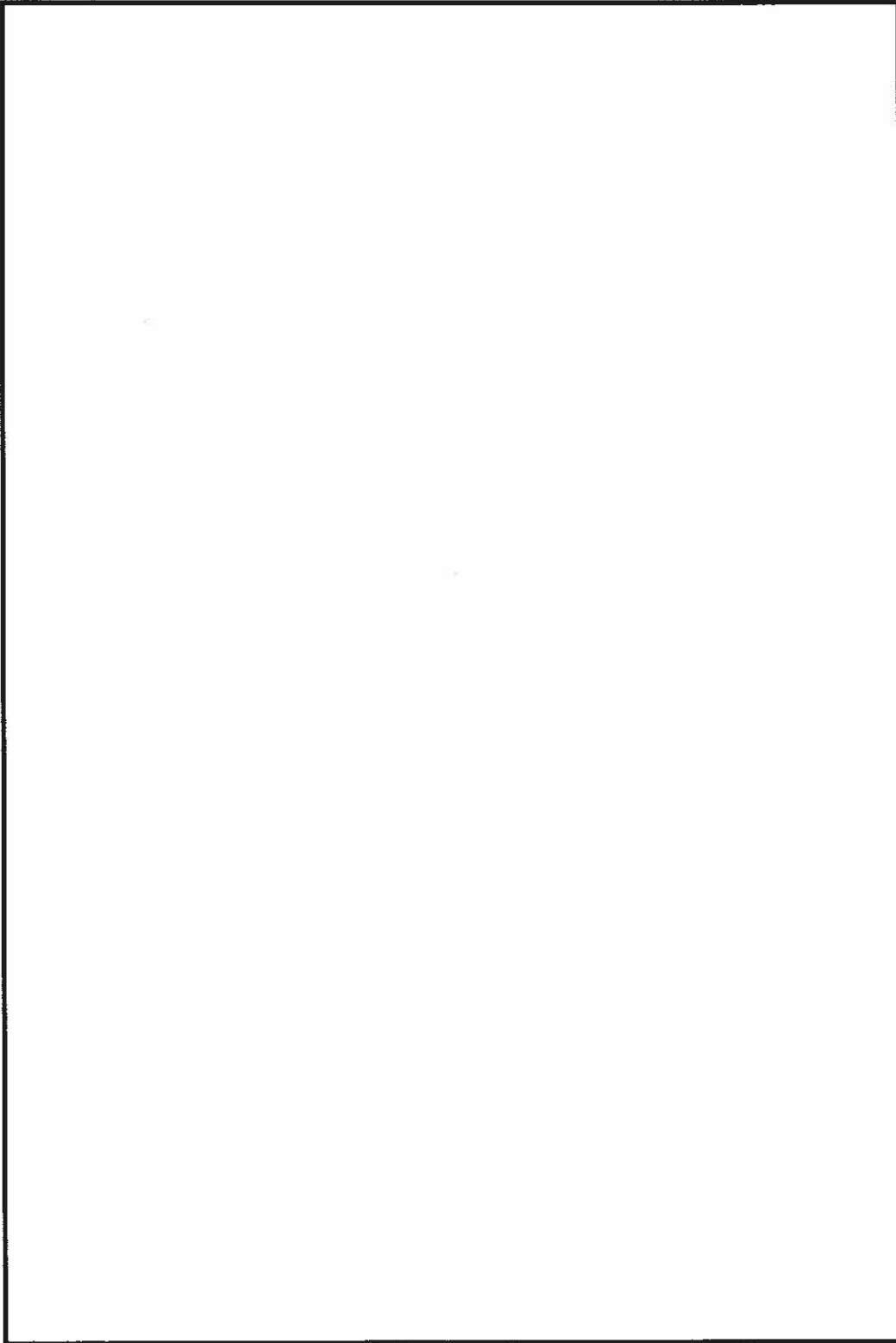
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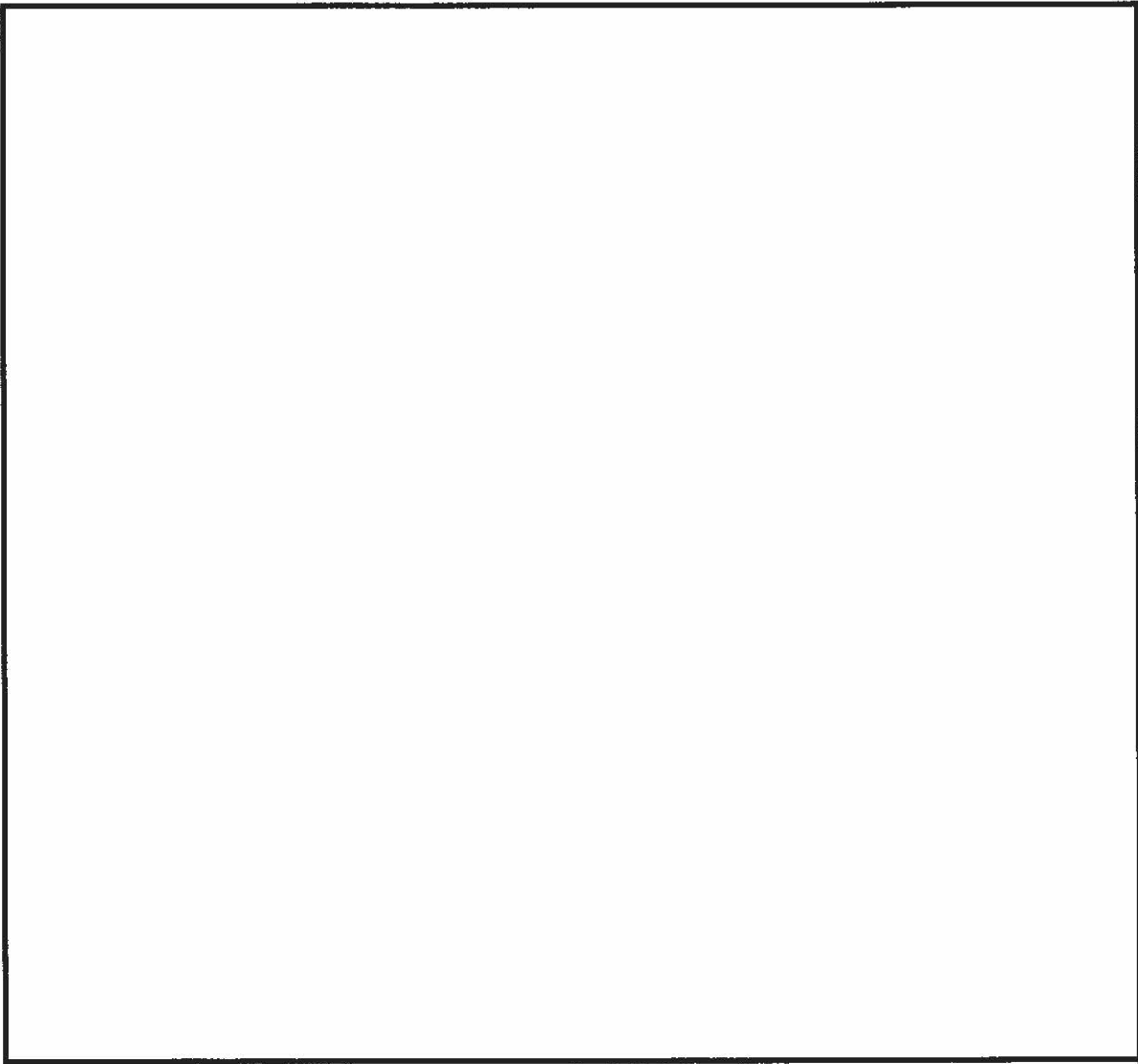






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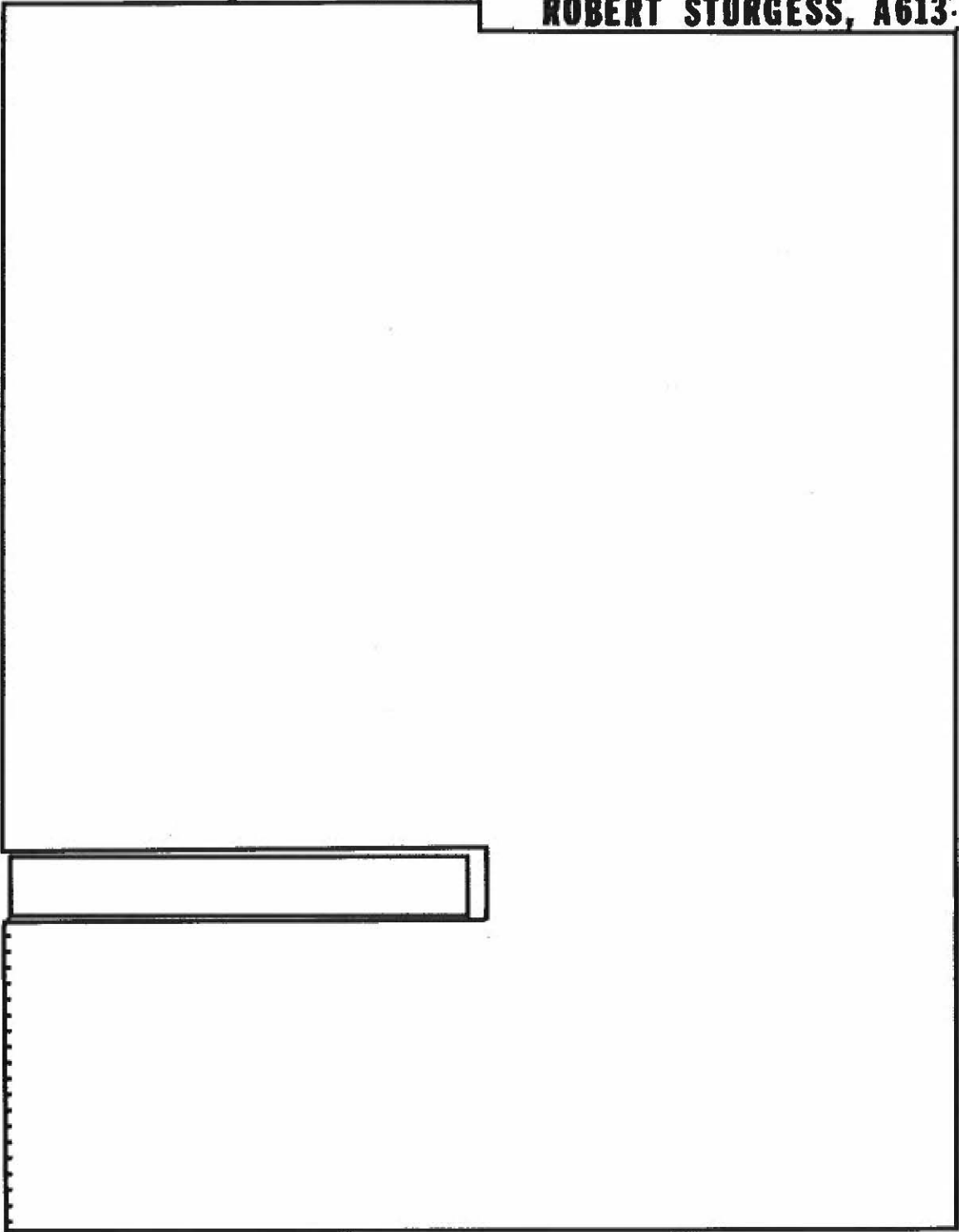
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**PROCESSING** [REDACTED] **COMMUNICATIONS**  
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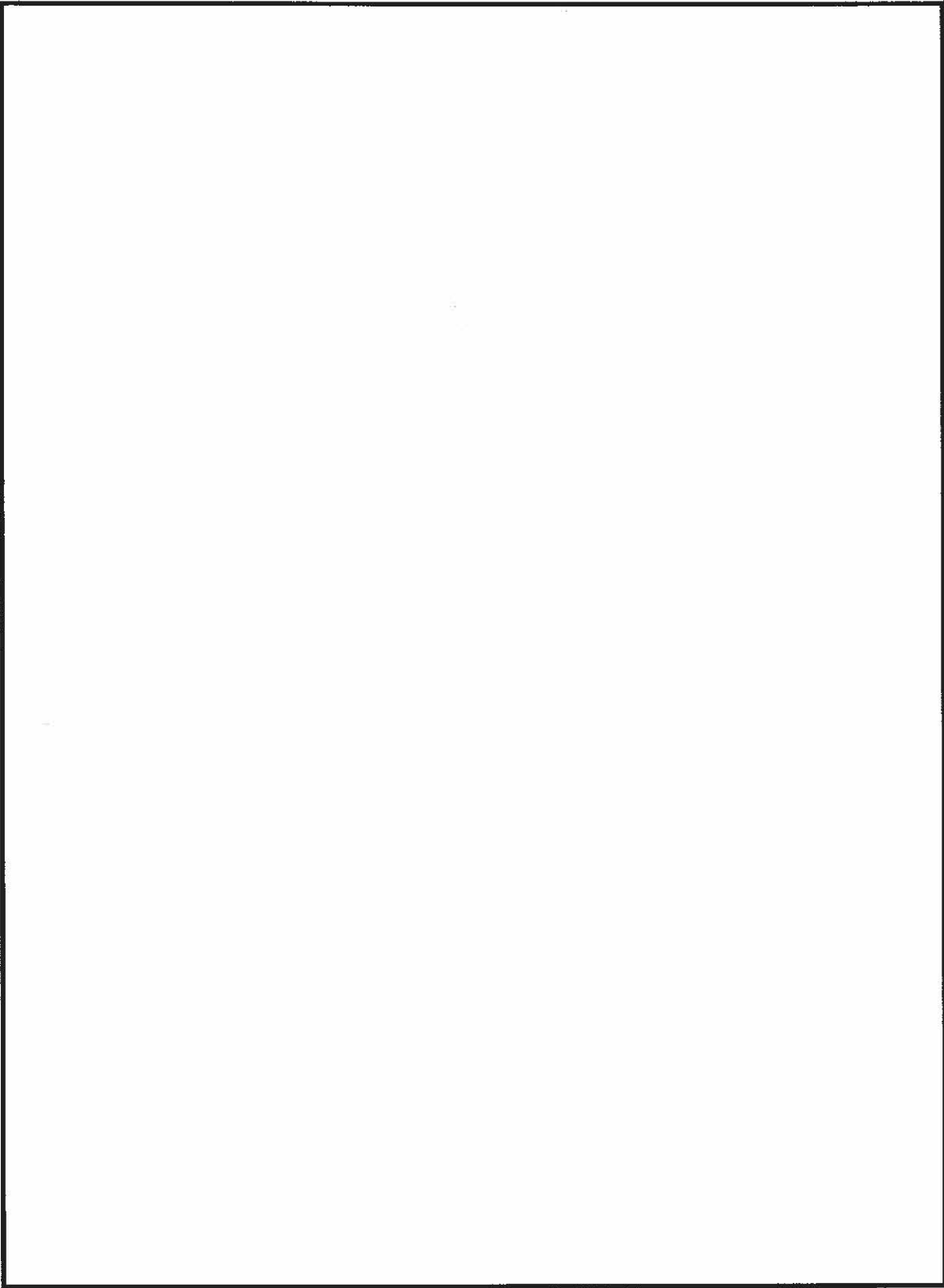
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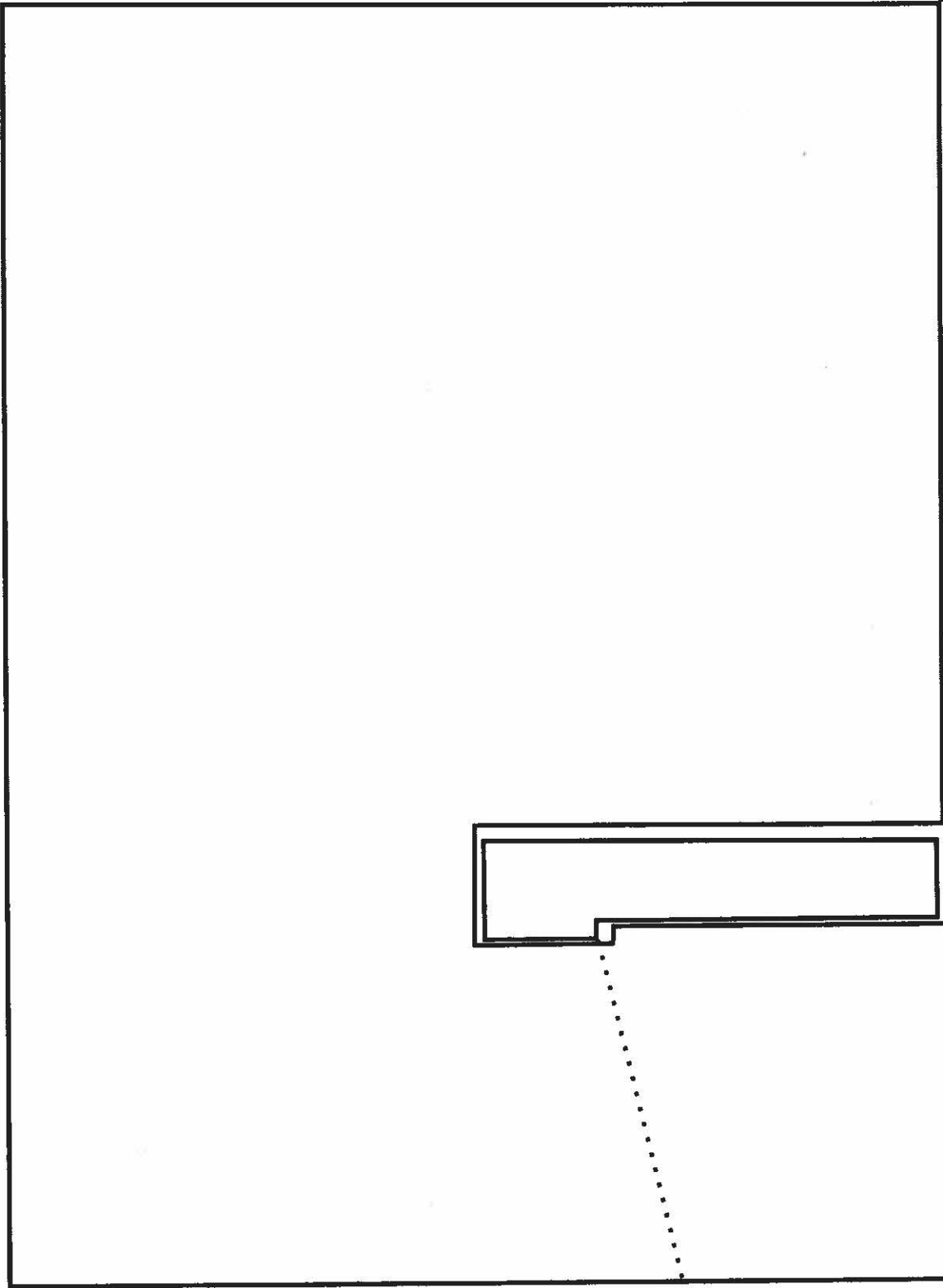


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# A FIX FOR THE LANGUAGE PROBLEM?

JOHN B. THOMAS, JR., Special Assistant, Language, A9

An "old hand" proposes a management tool that might be of help to deal with a perennial "bucket of worms."



Doris Miller's article "Language and the COMINT Production Process" (*NSA Technical Journal*, Summer 1974) falls gracefully into Alexander Pope's category of "What oft was thought, but ne'er so well express'd." It is for good reason that that article won the First Prize in the Crypto-Linguistic Association's 1975 Essay Contest.

I would like to expand this subject in the same general vein, by:

- supplying a kind of postscript dealing with some specific points about voice language work and the role of the military;
- examining the paradox: If these ideas were indeed "oft thought," why hasn't more been done about them?
- suggesting a methodology and management posture by which the working linguist's and the working linguist-manager's wisdom and observations can be converted from a still small voice into a real help for higher management.

Looking first to the voice problem, I would caution that we are on shifting ground in this area. Miss Miller discusses things that specialists almost unanimously feel should be done. She considers the problem to be one of enlightening and persuading management to put some force behind the ideas she projects. The voice problem, on the other hand, I think finds even specialists with more uncertainty about standards and procedures. This is no wonder.

The Voice Explosion is terrifying. Voice tape is the most anonymous, most unsortable, unfileable, indigestible, ungistable stuff in the world. What do you do, contemplating racks of tape containing a million or five million channel hours of voice? Obviously, you panic. You are lucky if you don't babble of green fields, but you do mumble for a few years about machine transcription, you speed up or slow down the tapes a bit, and you half-way persuade yourself that you have mechanized the problem when you have just mechanized the periphery. You zip voice tracks back and forth in fancy machines, and then you get more fancy machines to zip printed transcripts back and forth. But no "machine" can produce a transcript. Finally, you bite the bullet and admit that the human transcriber remains the heart of the business. The transcriber -- not a machine -- listens to the recorded voice intercept and discards it, gists it (in English

or in the original foreign language), or writes down word-for-word everything that was said (in English or in the original foreign language). This process is rarely one-for-one in terms of transcription man-hours required per channel hour. The best ratio might be 20 minutes per channel hour for selecting and gisting the easiest material; the average might be 3-4 hours to transcribe one hour of voice intercept. But would most nonlinguist managers believe that it can take 10, 20, or 30 hours to transcribe just one channel hour of voice material with poor audibility and high linguistic complexity, but also of high intelligence interest?

We need all the help we can get. Channel identification, dial recognition, and any other possible selection processes need to be exploited to the fullest to put the best possible intercept, the richest of all the ore, before the transcriber.

Does everyone fully realize that, until the magical "machine transcriber" appears, the voice language processor is the valve through which the whole production stream must flow? Some realize it and apply the unfair, pejorative term "bottleneck" to him. But the term is passive, whereas the transcriber is active. In fact, only in the degree to which he is active is any intelligence possible. And a person carrying out a key (that is, critical) process deserves to be recognized with at least a positive-sounding term. "Key processor" sounds awkward, but it is certainly accurate.

Key processor though he is, the Voice Language Analyst or Technician suffers from the fact that the Agency, both informally in the minds of supervisors and formally in the language of personnel handbooks, is uncertain and vacillating in its concepts about his career. At hiring time, his transcription skills are at a premium. Once hired, however, he will probably best serve his own interests if he gets out of transcription as quickly as possible. Transcription is a calling in which there are extraordinary physical and even emotional demands (particularly tolerance of noise), probably not amounting to hazardous duty, but beyond the usual threshold of irritations. The best and most assiduous transcriber tends to be isolated from most of his organization's activities by his attachment (literal and figurative) to his recorder -- a beautiful formula for not getting ahead in the

world. Aside from these obvious points, there are many questions of the predictability of success in transcription, the extent to which a person can overcome his initial reluctance to engage in it, the proper division of time for transcribers (do they analyze and report on the materials that they transcribe?), and the question of what carrots can be held out to them. There is generous room here for the specialist to analyze and institutionalize his experience and for the manager to apply it.

Role of the Military

Another thorny problem is the place of the military component in language operations. Part of the answer rests on the fact that *what* needs doing is only a part of the question. *Where* it needs doing and *when* are equally important. Does the job have to be done in an office close to all collateral resources and computer services? "From eight to five"? Or 24 hours a day? On a mountain on the border somewhere? In an airplane or on a ship?

In general, the military man cannot have the particular kind of continuity and depth on language problems that a civilian specialist can have. But he does have his own special qualities -- mobility, adaptability, awareness of what the command needs to know right now, and, most of all, the quality of being there and staying there. Add the qualities of savvy and a "good ear" and you have an indispensable member of the team.

It is an extremely difficult thing to train, use, supervise, and motivate military people in a field as complex as the processing of numerous languages. It would be a miracle if it were always done properly everywhere for every language. It will certainly be done better if linguistic, management, and military know-how are continuously focused on the challenge that each language poses to the operations of the entire SIGINT community.

The proper division between military and civilian resources on a language problem has to be established by weighing the what, where, and when factors, but not completely independently of the language itself. Is the language so difficult, for instance, that the military cannot assign the highly selected personnel and spend the training time and money to keep competent linguists in the front end of the system? In such a language as Arabic, for instance, I would suspect that this is more often the case than is fully accepted throughout the community: all that sounds possible in theory is not done in practice, never has been, and never will be.

Facing the facts, can the planners and operational and language experts come up with the best compromise? -- in particular, with the best mix of civilian and military language resources worldwide to spend the least and get the most?

Examining the Paradox

As I have said -- or let Alexander Pope say -- Miss Miller has written an excellent summary of the consensus of almost every gathering of language specialists that has occurred in the Agency for the past 10 years. If we *know* what should be done, why do we still have a "language problem"?

Well, for one thing, as Miss Miller cannily observes, it is hard for language processing to go bad with enough of a bang to get attention clear up the line. For another, we don't really have a monolithic Language Problem (complete with capital letters). Instead, we have a Chinese Language Problem, an Arabic Language Problem, a Korean Language Problem, a Mongolian Language Problem, and a Problem for every other language that we work or should work. This fractionation strains management's attention. But Command Attention in the military or Management Attention in the civilian world are the keys to improvement.

Language Checklist for Management

For clarity and impact, let us take several principles about the language business that Miss Miller and I have dealt with, and recast them as questions that management might ask -- in effect, as a language checklist for management. For the time being, let's avoid the question of who in management, or even what level, might ask these questions. I think it may develop that this is the biggest question of all.

● Questions on Basic Principles

Are resources in the language solidly related to the national priorities on the one hand and the possibilities for their satisfaction on the other?

Are tactical (direct-support) military requirements for language skill realistically provided for? By the most economical and most realistic means?

Is there a balance of cost and probable usefulness to U. S. security between National and tactical efforts, more solidly reasoned than the squeaky wheel system?

Do the analyses on which the above decisions are based cut sternly across what we feel can occur as the four built-in temptations toward bias of Community elements: "It's more equal than others if it (a) rolls on wheels, (b) floats, (c) flies, or (d) can be called 'National.'" (It seems unnecessary to specify who is tempted to hold the respective opinions.)

● Questions on Technical Skills

Is the civilian language-operational work force skillful enough to work materials in this language with a high degree of proficiency?

Is the military force proficient at what it must do? If not, should preparation be changed, elements of the job shifted, or should certain limitations be lived with as acceptable, balanced against the cost of eliminating them?

Are some people overtrained for their actual job, with unnecessary costs and personal frustration as a result?

● Questions on Management

At what point do language expertise, operational experience, and personnel and training experience in language converge to provide higher management with the best possible advice on allocation, development, and use of resources in this language? (On second thought, in some instances do they converge at all?)

Who makes the hard decisions that affect future capabilities in this language, especially the decisions with distant pay-offs? Examples: To spend money for long-term training for contingencies; or, conversely, to say that, while a certain contingency is possible, it does not, on balance, justify the use of scarce resources to prepare for it. Who takes and lives with the responsibility for the decision?

Does management training include emphasis on language processing? (To be specific, is Doris Miller's article required reading for managers?)

If this language is in a marginal or caretaker status, have full measures been taken to preserve continuity?

Is fragmentation avoided in that, even if the language must be handled in various divisions or offices, the training, professionalization, and collateral support are coordinated? By whom?

Is "coeducation" for linguists, managers, and systems analysts being conducted?

● Questions on Hiring and Training

Does hiring policy respect the long-range requirements of the language?

Is hiring flexible enough to get the best people when they are available?

Do we maintain and develop linguistic competence once acquired? Can we identify, for this language, the individual who bears that responsibility and carries it out?

Do we cross-train toward multilingualism for breadth and flexibility, where appropriate? (Or, for Voice Language Analysts: Do we develop the best voice linguists toward near-native aural comprehension, fully realizing the difficulty and cost of such development?)

Do we demand the highest professional standards?

● Questions on Techniques and Procedures

Are money, skill, and attention given to the development of language working aids? Does somebody fight for machine time?

Are linguists involved at the R&D stage, or as soon after as possible, in working with intercept and processing systems that will affect that language?

● Questions on Careers and Morale

Is there at least one visible civilian whose skill and professionalism in this language have clearly led to the senior grade he holds and the respect he is accorded? Is there a similar military man?

Is a young specialist's skill and productivity in this language directly and obviously a central factor in his advancement and the regard in which he is held?

Are many, if not necessarily all, linguists trained toward the attainment of "desk officer" status, with an analysis and reporting capability -- toward becoming an expert or potential expert in every sense of the word?

Need for Language Studies

The previous checklist might seem overwhelming, especially when one considers that it should be applied separately to each language of Agency interest. Is there a way to get a handle on the problem, to codify and institutionalize the principles implied in the list?

One way, working toward Command and Management Attention, might be to prepare a written study of every language of current and potential Community concern. Some languages can be discussed rather summarily: "No Bul-Bul traffic has ever been seen and none is anticipated. No work judged to be required. Dictionary (1905) and grammars (1887 and 1933) available in Cryptologic Library. Agency multilinguist Dr. Doe could identify texts in language if ever required." (Bul-Bul is mythical, but there are languages of this sort.) At the other extreme, a full study of Russian-language requirements would have to cover a lot of ground indeed. Both types of studies are needed, but the studies that are probably most needed are those for the in-between languages, which are neither so insignificant as Bul-Bul nor have had the continuing high-level attention that Russian has had.

Whether one paragraph or a hundred pages long, each language study might well have the following characteristics:

- It should represent expert opinion, based on linguistic and language-operational experience that is backed up by factual and statistical information.
- The body of each study should describe and quantify the operations requiring the language; show the intelligence requirements that "steer the system"; examine personnel, career, and training adequacy, both for civilians and for military; examine the present civilian-military balance in the language and decide whether it is in accordance with cost and production efficiency studies and with policy considerations; and, finally, examine as objectively as possible the extent to which increased language resources (including quality upgrading) could increase U. S. intelligence production, and, conversely, the extent to which a decrease or cutback would reduce that production. The study should ask and try to answer all the questions on the checklist.
- Each language study should be prefaced with a clear and skillfully written summary of the principal problems or issues pertaining to operations in that language. If there are unsettled policy issues, decisions that will have to be made in the future, shortfalls of quality or quantity, those points should be fairly summarized. Those statements, brought together (perhaps with an analytic prologue and "summary of the summaries"), would let any reader, including the decision-maker, know more about the Community's language posture than has ever been known before.

Who Will Ask the Questions?

If these are the right procedures, one thing is conspicuous about them: No stroke of the pen, no adopting of new recommendations by manpower committees, no single directive, is going to establish that the right questions can be asked and the right steps taken to see that they are eventually answered affirmatively. That can

only be done by long-range policies and long-range supervision of their application.

Who can ask the questions, direct the language studies, pinpoint the problems, and follow up with corrective action?

In a sense, of course, good managers are asking and trying to answer the key questions every day -- not consciously, perhaps, but as a part of the good manager's instinct for better operations.

It is useful to have nice competent people whose good instincts tell them to do proper things for the language business, along with their other duties, and within the limitations of how they rank and where they are placed organizationally. We have such people.

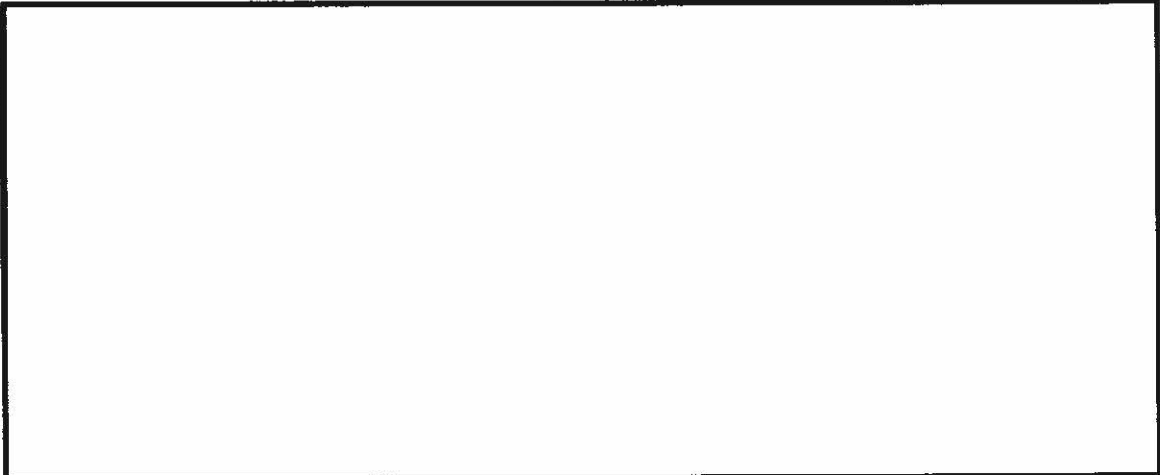
But if many good things are really to happen and keep happening, perhaps we also need a senior individual, placed where he can swing weight in matters of plans, money, careers, and policies throughout the Community, not just within NSA, a person whose business -- preferably his sole business -- is to see that things go right with SIGINT language operations.

If such a solution is hopelessly unacceptable organizationally, maybe there are clever people around who can see a way to achieve the same results through other management devices.

The Language Problem is big enough to justify the best thinking by the best people to arrive at the best strategy. The trouble is that, while big enough, it may not be visible enough. Meanwhile, things in the language world continue to go wrong from time to time -- not with a bang but a whimper.

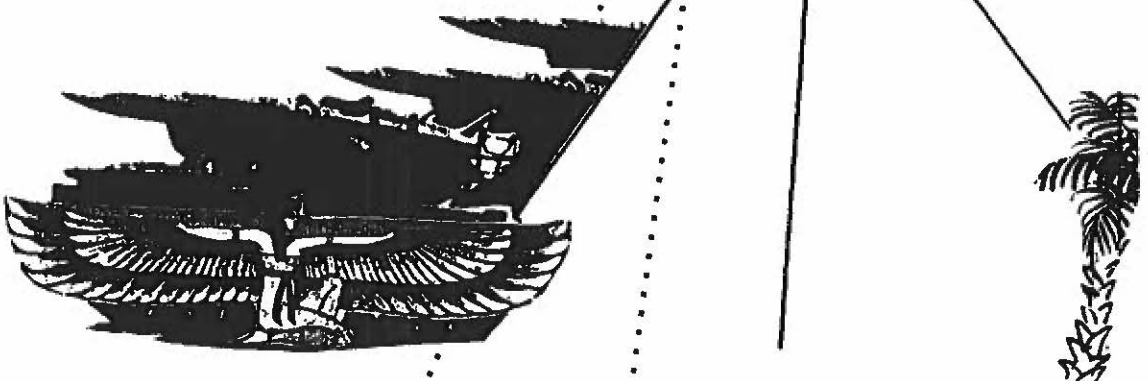
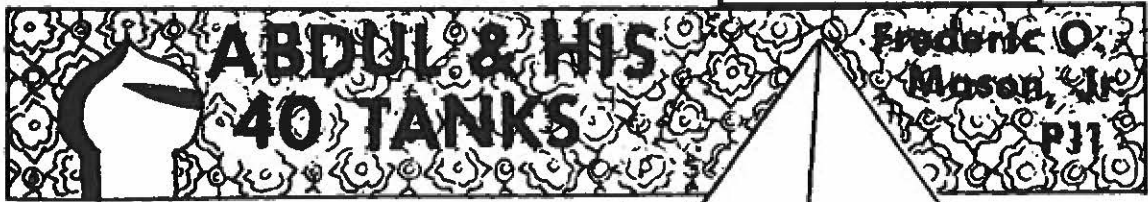


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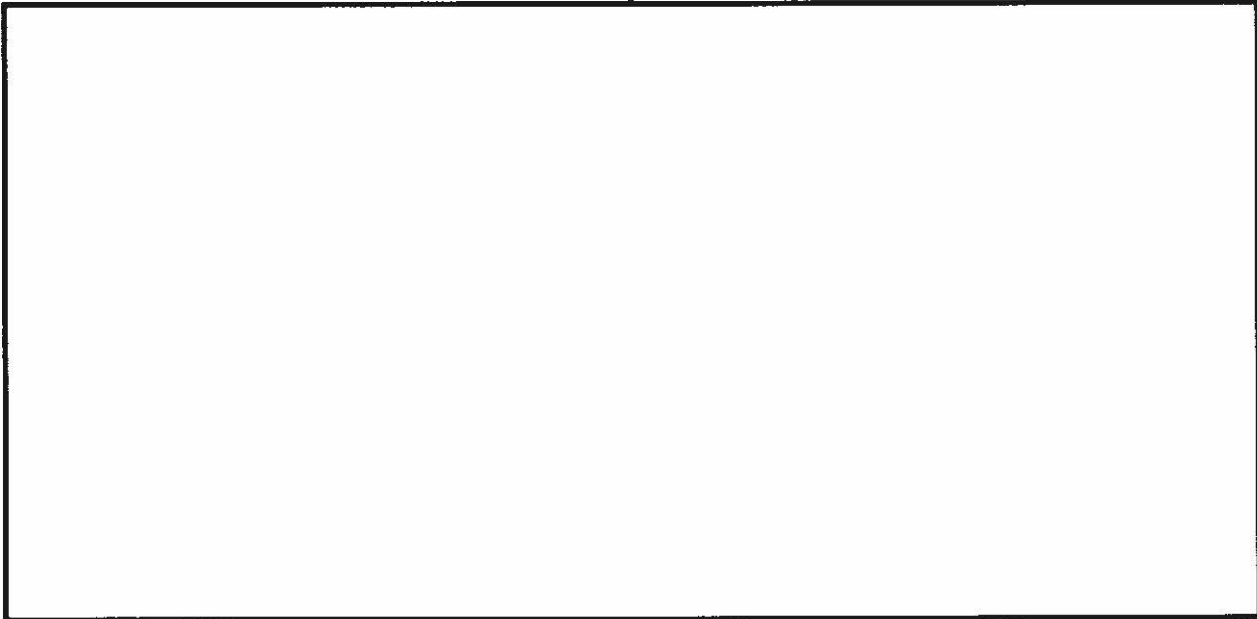


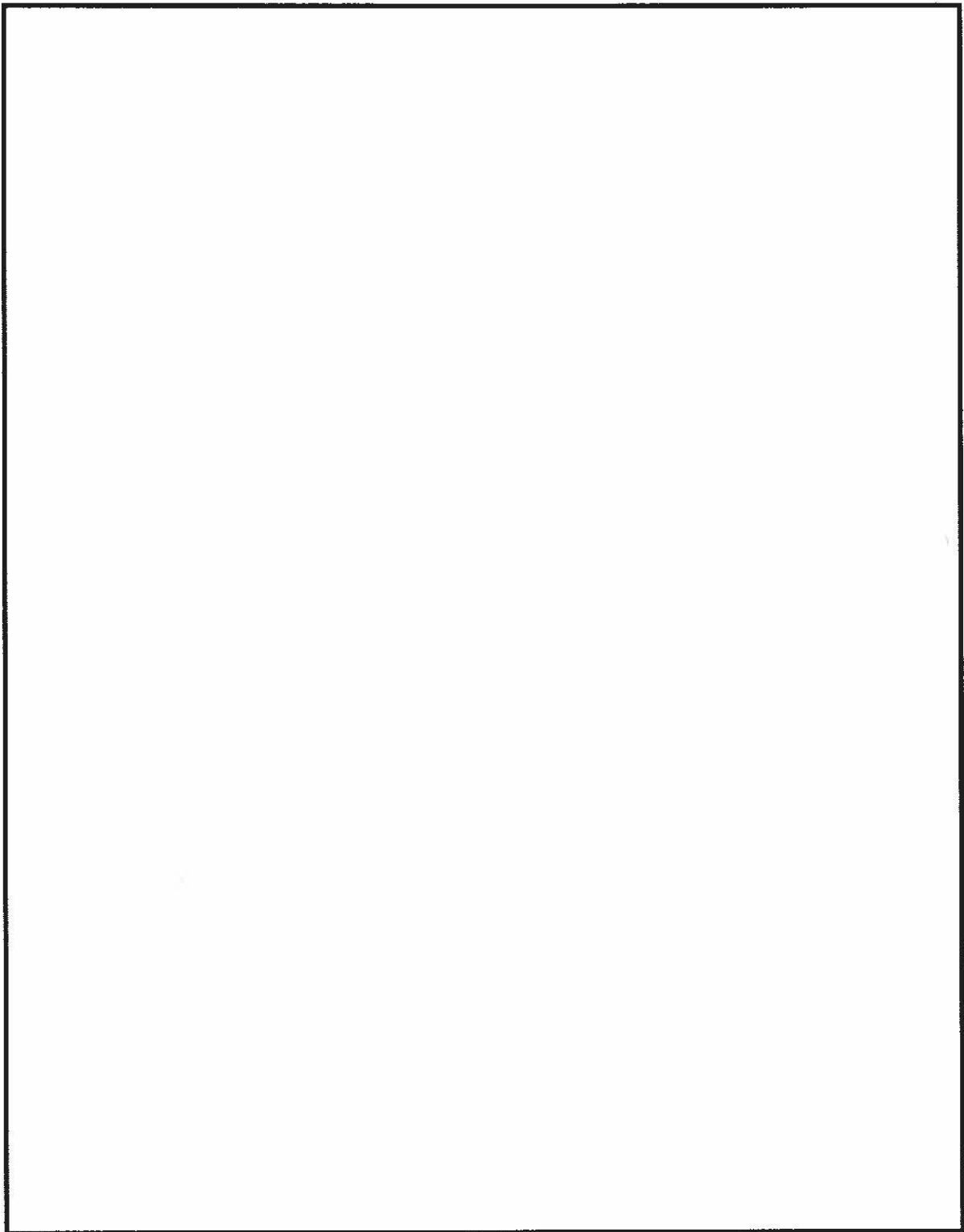
One of our major problems with coverage of the Near East is that normally we are not close enough to get line-of-sight VHF traffic directly and without covering such a large area that separation of target groupings into homogeneous sets is difficult.

In the following traffic it is assumed that the VHF traffic is copied in a very short daily window from [redacted] and that the HF voice is copied on a matching schedule from some site in the Mediterranean. While there is

no pretense that this resembles actual traffic, still the problem does illustrate that unit identifications, whether real, or by using target covernames or covernumbers, or by using T/A arbitraries, can be carried forward in time by T/A solutions.

Also illustrated is the common T/A problem of having to keep track of a wide variety of classes of terms, some of which are synonyms or nearly so, and others of which are related but different.





• Answers will appear in next issue of CRYPTOLOG.

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~~HANDLE VIA COMINT CHANNELS ONLY~~





# LINGUISTS -- WE NEED AN "EXPERTS YELLOW PAGES"! Jane Merlin, G522

Time was when a translator had to be extra careful when dealing with the difference between "request" and "demand" or with the exact rendition into English to indicate just how miffed or mad or scared the original drafter of the message had been. Life was simple then, or so it seems now. The *subject matter* in the messages was "general liberal arts," although the language [redacted] was always much more precise than the language appearing in the daily press. But U. S. interests are a bit more complex and technical now, and so are the subjects that our message texts deal with. Our general-purpose dictionaries, or even our specialized dictionaries, are neither up to date nor up to it.

Simultaneous interpreters advise us to study, in advance, English-language reference aids dealing in general with the subject matter that is likely to be discussed in the foreign language. But we NSA-ers can't always do this. Not when a single translator might have to deal with *specifics* of:



So the translator is confronted, say, with

"GRFULLING widgets"

[redacted] He knows his target country and its language. Let us also assume that he has pretty good general and specialized dictionaries. But he knows absolutely nothing about widgets except possibly that they don't bite. None of his English-language reference aids even mention widgets or any process that sounds like GRFULLING. So he checks "GRFULL (v.)" in all his dictionaries. He finds lots of meanings: *turn* a key, *rotate* a prism, *roll* a missile, *spin* (but not *tumble*) a gyroscope, etc. He gets the idea of rotary motion, but still he does not see any reference to the word in connection with widgets. He knows perfectly what the word means in general but not the *specific* English term as applied to widgets. At this point he doesn't need a better expert in the target language. Nor does he need a more up-to-date dictionary (there probably isn't one anyway). What he needs is a *widget expert*.

Now somewhere in this Agency or in the community in general, there is probably someone who is an expert on widgets. Perhaps he has a de-

gree in widget design, or used to work in a widget factory. Maybe he's just a "widget nut" who is interested in them as a hobby -- maybe he's even the president of the American Amateur Widget Nuts.

Assuming that that expert does exist, how does the translator find him in time to fill the hole in his translation? By trial and error the translator might manage, after 15 phone calls, to locate someone "almost as good." It's a guy in the basement who thinks you "ROLLEX" widgets, but isn't sure of the spelling. So, with the production deadline still approaching, the translator still hasn't found the expert who can provide the precise answer, and he is forced to cop out with a "literal" translation, a weasel-worded footnote, and a generally dissatisfied feeling.

What we linguists need is a book of "Yellow Pages" of expertise, a list of individuals, by name (not a list of branches, since we do not have any "Widget Problem"), who are likely to know the English word for things and processes in every conceivable field from industrial sanitation to beekeeping. That list could be made available to every translator. If he had a question about the precise English word in a technical field, he could let his fingers do the walking...

Do I hear someone say that this would put a large burden on the "experts," and is only a translator's scheme to get out of reading stacks of collateral? Actually, however, a translator could read The New York Times from front to back, if he were a speed reader and had no other hobbies, trying to locate all the news items on [redacted] and could read through all the past issues of [redacted]

[redacted] and never once see the specific technical term for gyrating widgets. So wouldn't it be more efficient, more economical, more professional to try to locate the person at NSA, CIA, or wherever, who can solve the translator's dilemma immediately?

With the "Yellow Pages" at hand, the translator would not have to make do with a "general" or "literal" translation (which could be wrong or misleading -- remember *spin* vs. *tumble* for gyroscopes?). He could avoid that unsatisfied feeling. He could call the expert and ask, "What do you call it when a widget goes round and round? . . . Oh, ROLLEX. How do you spell it? . . . R-O-L-E-X, with one L. Thanks a lot!" One phone call (with the results recorded in the margin of his dictionary) and it's done. The recipient of the translation for whom widgets are a burning issue is given completely accurate information, instead of vague, misleading, or even erroneous information from an "almost right" translation.

How about it? Don't you agree that translators need an "Experts Yellow Pages"? Come to think of it, a lot of nonlinguists could probably use it too!