

Problems and Progress in the Research Project on Compiling *A Universal Dictionary of Philippine Languages: The First Four Years*

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1. Introduction

Way back in 1961 when I decided to conduct a long-range research program on the languages of the Philippines, one of the major projects which I planned to undertake after several years of conducting fieldwork throughout the country was a dictionary of the synonymous or equivalent words and phrases from Philippine languages. I provisionally entitled this project "A Thesaurus of Philippine Languages."

After more than a decade doing research on Philippine languages, especially in the field, collecting data from and information on more than 500 Philippine languages and dialects, I thought I still would not be able to launch my dictionary project due to two important reasons. First, I believed I would not be able to get from my university or from any research-funding agency in my country the funds needed to undertake the project. Second, I thought the technology and equipment needed to compile such a dictionary embracing from 10,000 to 20,000 sets of synonyms or equivalent words and phrases from more than 100 languages was not yet available or accessible to me.

Then in 1983, I was invited by the Toyota Foundation to submit a research project proposal for possible funding by the Foundation. I mulled over this matter for some time until finally in 1986 I decided to submit to the Foundation a grant application for my long-planned dictionary project which was given the new title of *A Universal Dictionary of Philippine Languages*. I figured that if the Toyota Foundation would agree to provide the funds needed to pursue the project I would be ready and willing to devote five of my remaining years in my university to compile a dictionary of 100 or more Philippine languages which I had dreamed of doing a quarter of a century ago. From talks with my colleagues in my university I learned that the computer system, which had by then become quite available in my university, would be able to handle all or nearly all the various tasks required by the project. In the light of this, I said that should the Toyota Foundation decide to support my project proposal, the Foundation would be giving me the chance of a lifetime to make my most substantial and significant contribution to Philippine linguistics and perhaps also to lexicography. I therefore submitted in 1986 to the Toyota Foundation a grant application for the research project. Happily, the Foundation decided to support the project for a period of three years.

2. Aims

In the beginning, I could not decide whether to use English or Filipino, our national language, as the "source language" from which the main entries of the dictionary would be selected. After spending some time deliberating on this matter, I decided to use English as the source language due mainly to the aims which I had adopted for the project, which were the following:

- (a) To compile in one dictionary equivalent words and phrases from 100 or more Philippine languages.
- (b) To show the similarities and differences of Philippine languages on the basis of the phonological, morphological, syntactical and semantical features of their equivalent words and phrases.
- (c) To aid in the recording and preservation of words and phrases from Philippine languages, especially those languages which have very little or no significant written records or are on the verge of extinction.
- (d) To aid in the search and selection of words from the different Philippine languages which may be used in further developing and enriching the Filipino national language especially with respect to its vocabulary, phonology and morphology.
- (e) To show the “onomasiological gaps” or single words that are lacking in the Philippine languages, especially Filipino, in relation to English from which Filipinos get most of their information on modern scientific, technical and cultural developments.
- (f) To aid Filipinos in the comprehension of words and texts in English, which continues to be the dominant and controlling language in their government and educational system as well as in their professional and economic endeavors.
- (g) Finally, to aid Filipinos in the translation of texts written in English into their national language and other Philippine languages which are better understood by the Filipinos.

When I submitted to the Toyota Foundation in 1986 a grant application for the project, I believed (as I continue to believe) that a dictionary with the above aims was timely and very urgently needed because of two significant developments in the country. First, the present *Constitution of the Republic of the Philippines* which was ratified in 1987 specifically provides that Filipino, the national language, “be further developed and enriched on the basis of Philippine and other languages.” Second, the same constitution provides that the government should initiate and sustain the use of Filipino as the language of the government and of the educational system. The universal dictionary when published will surely be of tremendous help to Filipinos in further developing and enriching their national language, Filipino, and in their shift from English to Filipino as the medium of their official communication and of their educational system.

3. The dictionary entries

After making the decision to submit a grant application to the Toyota Foundation for my universal dictionary project and more than six months before the official start of the project, I immediately embarked on the task of selecting the English main entries. I selected the entries from several English dictionaries that I could lay my hands on. Each entry after being selected was immediately translated into, or provided with its equivalent or equivalents in, Filipino. Thus, when the project officially started in December 1986, the selection of English entries was practically done and the more than 20,000 English entries which had been selected had also been translated into Filipino. The result was an English-Filipino Dictionary which we intended to use in eliciting the equivalents of the English entries from Philippine languages.

The following is a short description of the entries of the *English-Filipino Dictionary*. The English main entries are words, phrases, and a few abbreviations. The letters of the alphabet, parts of words, such as prefixes, suffixes and combining forms, contractions, irregular plural forms of nouns, irregular past tense and past participle forms of verbs, and names of human beings and geographic formations are not included as entries. Each entry word is followed by the abbreviation of the part of speech to which it belongs.

A word belonging to more than one part of speech appears as a separate main entry in each of its functions. Examples:

fish, n. FIL isdá.
fish, v. FIL mangisdâ.

There are, however, a few entries which are followed by two part-of-speech abbreviations. Examples:

female, adj.; n. FIL babae.
extra, adj.; n. FIL esktra; sobra; labis.

A phrase which is used as a main entry appears after the most important word in the phrase which is placed before the phrase followed by a colon. Examples:

adultery: commit adultery, FIL makiapid; mangálunyâ; mangaliwâ.
bath: take a bath, FIL maligò.

A word or a phrase which has more than one sense appears as a separate main entry in each of its senses, and these senses are numbered consecutively. Examples:

bitch, n.1. (a female dog) FIL babaeng aso.
bitch, n.2. (a spiteful woman) FIL bruha.

There are also some entries which refer the user to its synonyms where their equivalents appear. Examples:

accede, v. See **agree** v.2.
alligator pear, See **avocado**.
agree, v.2. (be in accord) FIL sumang-ayon/sang-ayunan.
avocado, n. FIL avokado.

The Filipino equivalents of the English entries are words and phrases. The Filipino equivalent or equivalents of a particular English entry may be one or more of these forms. Many English entries have no single word equivalents in Filipino. Each Filipino equivalent or group of equivalents is preceded by the abbreviation FIL. They follow the part of speech form of their corresponding English entries. If the Filipino equivalent of an English entry is a new or unfamiliar or proposed loanword, a phrase explaining the meaning of the loanword is usually added. Examples:

computer, n. FIL kompyuter; isang elektronik na màkinà na gumàgawâ ng mga kalkulasyon, nagtítipon at nag-áanaláys ng mga impormasyon, at otomatikóng kumúkontról ng mga màkiná.
physics, n. FIL físiks; pisiká; sayans na tungkól sa mga katángian, pagbabago, inter-aksyon, etc. ng mater o bagay at énerjí.

molecule, n. FIL mólekyúl; pinakamaliít na pártikél o sangkáp ng isáng elemento o kompawnd na pwedeng mag-isá ng libre at tagláy pa ang mga kátangian ng elemento o kompawnd.

The Filipino verb equivalent appears in its “infinitive” form, which is the form that occurs after the Filipino verb **gusto(ng)** which is equivalent to English ‘want (to)’, or before the Filipino word **sana** which has the meaning of ‘hoping’ or ‘wishing’. If the Filipino equivalent of an English verb entry is a transitive verb, both the active and goal-passive (infinitive) forms of the verb are given with a virgule between them. The reason for this is that a verb in Filipino and other Philippine languages are formed by a verbal affix being attached to a stem, and there are several active and goal-passive affixes which cannot be used interchangeably with the same stem. Examples:

crawl, v. FIL gumapang.
drink, v. FIL uminóm/inumín.
wait, v. FIL maghintáy/hintayín.

The Filipino locative-passive verb which may also be used to translate the English entry in place of the active verb or the goal-passive verb is given after the intransitive active verb or the goal-passive verb preceded by a virgule. The different Filipino verb types that are separated from each other by a virgule may be used separately to translate a single English entry. This grammatical phenomenon is described in the Introduction to the dictionary. Examples:

approach, v. FIL lumapit/lapitan.
borrow, v. FIL humirám/hiramín/hiramán.

Variant forms of some active or goal-passive verbs are separated by a comma. Examples:

cook, v. FIL maglutò, lutuin.
fetch water, FIL mag-igíb, umigíb.
go, v.1. (move along) FIL pumuntá, magpuntá.

4. Collection of Equivalents

When the project officially started in December 1986, copies of the *English-Filipino Dictionary* which was compiled in order to be used in collecting the equivalents of the English entries from other Philippine languages were immediately produced by using typewriters and later a mimeographing machine. With these copies we started collecting equivalents from other Philippine languages.

Let me now describe briefly the procedure that we followed in collecting the equivalents of the English entries from Philippines languages.

Long before the start of the project we decided that we would collect the equivalents from the Philippine languages in the same way that we had been collecting data from Philippine languages, which was by direct elicitation of forms from native speakers of the languages. Dictionaries and vocabularies, published or unpublished, and other printed sources would only be consulted whenever necessary. We made a random survey of available dictionaries and vocabularies of Philippine languages and found out that most of them, unlike the dictionary that we were going to compile, use a Philippine language as the source language; that is the main entries in each of these dictionaries and vocabularies are from a Philippine language. We also

found out that our dictionary would have many more entries than almost all of the dictionaries that we saw.

As soon as the project started, we concentrated first on translating the *English-Filipino Dictionary*, which was practically completed, into each of the three major regional lingua francas, namely Sebuano, Ilukano and Hiligaynon, in order to produce three trilingual dictionaries. We wanted to compile the three trilingual dictionaries as soon as possible because we intended to use them immediately as eliciting dictionaries together with the *English-Filipino Dictionary*. The compilation of the three trilingual dictionaries was completed after a few months and they were immediately encoded into our computer and printed. Copies of the trilingual dictionaries as well as of the earlier bilingual dictionary were xeroxed. This method of duplicating copies was much cheaper, more convenient and not burdensome on our computers, printers and personnel.

The four eliciting dictionaries were used separately in the following manner. The *English-Filipino Dictionary* was used for languages spoken in regions where the dominant lingua franca is Filipino or Tagalog; the *English-Filipino Sebuano Dictionary* in regions where Sebuano is the dominant lingua franca; the *English-Filipino-Ilukano Dictionary* in regions where the dominant lingua franca is Ilukano; and the *English-Filipino-Hiligaynon Dictionary* in regions where the dominant lingua franca is Hiligaynon. Later, we produced an *English-Filipino-Tausug Dictionary* which we used in eliciting the equivalents of the English entries from languages spoken in the regions where Tausug is the dominant lingua franca. These five eliciting dictionaries have been extremely helpful, perhaps even indispensable with respect to some languages and informants, first in eliciting the equivalents of the English entries from Philippine languages, and later up to the present time in checking the equivalents. It did not surprise us to learn again that many Filipinos, especially those belonging to minority groups residing in remote places, did not understand English, or understand only a little of this language. On the other hand, we were able to confirm our earlier findings that Filipinos in general, including those residing in remote places, could speak and understand at least one of the above-mentioned five lingua francas.

A few months after the start of the project we also prepared a list of more than 1000 "test sentences" in Filipino with English translation. These sentences exemplify various grammatical structures in Filipino and other Philippine languages. This list was also translated first into Sebuano, Ilukano and Hiligaynon and afterwards into the other Philippine languages. We intend to use these sentences to describe the grammatical structure of the languages. This grammatical description will appear in the Introduction to the dictionary. The project will not, however, publish the lists of sentences, though they will all be encoded into our computers in separate files.

5. Informants and Informant Work

Months before the start of the project, we started contacting native speakers of various Philippine languages in our university and in the Metro Manila area and contracting them to translate into their languages for our project. First priority was given to native speakers of the three major regional lingua francas, namely Sebuano, Ilukano and Hiligaynon. Because of the great length or "density" of the dictionary to be translated into each language and also because the main entries of the eliciting dictionary were from English, we looked for native speakers who were literate in English and who were high school graduates, college students or college graduates. However, for a few minority languages we could not find persons like these so that we had no choice but to use as informants or translators persons who had very little schooling but who could at least read and write their own languages and also Filipino or any of the other

lingua francas. These informants were told to simply translate into their languages the equivalents of the English entries in Filipino and/or the regional lingua franca included in four of the five eliciting dictionaries.

For one language we also had no choice but to use nonliterate native speakers as informants. Nobody that we asked knew any native speaker of the language who was literate. For at least two other languages we also could not find any literate native speakers. Luckily, we were able to get literate non-native speakers of the languages who had become fluent speakers of the languages. Nevertheless, we hope to find the time and opportunity later to make at least a random check of the translation in these two languages which was done by the non-native speakers.

The following is a brief description of the procedure that we have adopted in conducting informant work with literate native speakers. When a literate person is taken in as an informant for his native language, he is first asked to give or write down his (or her) full name, where he was born, when he was born, where he grew up, his home address and present address, his educational attainment and where he studied. After explaining to him the purpose of the project, he is given some pages of the eliciting dictionary, usually the pages for one or two letters, or the list of sentences. The informant is next given the following instructions. He is instructed to translate the entries into his own language or dialect with the equivalents in Filipino and/or another lingua franca as models. He is instructed to write his translation on the pages of the dictionary below the entries. He is instructed to put all the equivalents of each entry that he can think of. He is instructed to spell the words in his language in the way he knows and that he should try to be consistent in using the letters of the alphabet, especially the letters for the vowels. If necessary, he is taught to write the words in his language phonetically or phonemically. We try to determine the phonetic values of the letters used by the informant by asking him to pronounce to us some of the words that he has written down. After the translation of a dictionary is completed, we choose one informant to tape-record the whole dictionary. However, if we find that the words in a dictionary are satisfactorily transcribed, we tape-record only some sample words and phrases. But we always tape-record the translation of the sentences in each language.

In the unique case of the nonliterate native speakers of one language, this was how we did informant work with them. We selected several native speakers of the language in their village and three members of the staff of the project worked separately with one to three of them. We would say a Filipino equivalent of an English entry and the native speaker or speakers together or one after the other would pronounce its equivalent or equivalents in their own language which we would immediately transcribe phonetically and later, after we had identified the phonemes of the language, phonemically. This type of informant work was very difficult, very tiresome and very slow. It took us about a year to complete the translation of the whole dictionary. We used the same technique of elicitation when we recorded and checked the equivalents.

Each of the languages that have been translated, except for one or two, was translated by more than one translator. As a matter of fact, most of the translated dictionaries were translated by more than three translators. One literate translator working eight hours a day six days a week would take an average of about four months to translate the whole dictionary. Some of the translators were fast, others were slow. Some were very careful and meticulous, others were not so careful. Some knew their languages well, others had difficulty translating into their languages. Many stopped working before the work was finished. Some did not return to our

office after working there for only a day or two. We found out that the most reliable way of getting good translators was to try as many translators that we could find and afford to pay and then choose the best among them and pay them a bit higher than the ordinary ones.

Only a few of our informants worked full-time; most of them worked some hours each day seven days or less a week. Many of them worked after office hours, on weekends and on holidays. Many of them worked in our office, which was open until June this year from 7:30 o'clock in the morning until 9:00 o'clock in the evening, seven days a week. (Starting July this year in order to reduce energy cost our office is open six days a week from 7:30 o'clock in the morning until 8:00 o'clock in the evening.) Many of the translators worked in their homes, boardinghouses, and dormitories where some of them said they felt more relaxed and confident because they could consult their relatives, friends and others about the translation of some words.

For many languages we could not get native speakers in our university and in the Metro Manila area. We went to various parts of the Philippines to look for native speakers of these languages. We established substations in at least eight towns and cities located in different parts of the country which attended to the collection of the equivalents from languages spoken in or near their respective areas. We also brought to the campus of our university quite a number of native speakers where they worked in full concentration under our direct supervision and care. This arrangement produced very satisfactory results despite its having caused some difficulties, inconveniences and also extra and unexpected expenses.

After an eliciting dictionary is translated into a language, the equivalents in the resulting dictionary are next checked one by one by the translators themselves or by other native speakers under our direct supervision. Every dictionary undergoes checking in order to find the best equivalents of the English entries and to eliminate semantically incorrect, inappropriate or farfetched translations; to phonemicize and regularize the spelling of the words and to correct spelling or typographical errors; and to see to it that each English entry has an equivalent or equivalents and that each equivalent is in the form that is similar to the form of its corresponding entry or of its gloss. Most of the dictionaries are still being checked through most of them have been checked at least once. The final checking of all the dictionaries will be done by us in the project. Needless to say, the quality of the individual dictionaries and the composite universal dictionary will depend ultimately on how well they are checked. It is for this reason that we are earnestly hoping that before we actually go to print we will be given sufficient time and means to check thoroughly the individual dictionaries as well as the universal dictionary which will be produced by merging the individual dictionaries.

The universal dictionary will be provided with an Introduction and Explanatory Notes. The Introduction will contain at least the following sections: a) Identification of the languages, their names, the places where they are spoken, the number of their native speakers, their functions, etc. b) A grammatical description of the languages and their subgroups; and c) a map showing the locations of the languages. The Explanatory Notes will describe the form of the main entries, and the form and transcription or spelling of the equivalents. An index of the Filipino words and phrases used in the dictionary will be added at the end of the dictionary. This index will be generated by reversing the *English-Filipino Dictionary*.

6. Hardware and Software

The project started with one computer and one printer. Before the end of its first year in 1987, four additional computers were acquired. A second printer was acquired in December 1988 and in the following year, another printer was borrowed from our Department of Linguistics. Thus, at present, the project uses five computers and three printers.

We have developed and copied many softwares or programs for use in the project. We use Dbase III+ in encoding, sorting and merging the data. We use several printing softwares. We have softwares to reverse dictionary entries and sort reversed dictionary entries. We have softwares to trace the existence of viruses and wipe them out, to protect diskettes and hard disks against viruses and to wipe out Microbe, Pentagon and (C)Brain viruses. We have software to protect files against accidental deletion and to recover accidentally deleted files. We have software to convert database dictionary files into ASCII text files to be used in WordPerfect, Ventura Publisher (a desktop publishing program), etc. We intend to use Ventura Publisher for editing the dictionary and for printing a camera-ready copy of it on a laser printer. (See the Appendix for the complete list of software.)

7. Conclusion

The project was originally conceived for the purpose of compiling a dictionary of a hundred or more Philippine languages in five years. The Toyota Foundation initially approved a three-year duration for the project starting December, 1986. Each year the project would work on 35 languages so that after three years the project was expected to have collected data from 105 languages and to have checked and prepared the data for publication.

During the second year of the project, it was agreed that in order to reduce the budget of the project in its third year and also to give the project leader and personnel of the project more time to collect, encode, check, merge and edit the data, the project was extended to four years. Then during the middle of the fourth year, it was again agreed that the preparation of the data for publication including the writing of the introduction be transferred to the fifth year. It was also agreed that the estimate of the cost of printing the dictionary be submitted during the fifth year and that the printing of the dictionary be deferred to the sixth year. The number of copies of the dictionary to be printed is still to be discussed in relation to the length of the dictionary and other matters.

Let me now recapitulate the steps that we have taken so far in compiling *A Universal Dictionary of Philippine Languages* with English as the source language. The first step was the selection of English main entries. Each entry, with very few exceptions, was made to belong to only one part of speech and to have only one sense. To avoid many repetitions of some sets of equivalents, some entries were not given equivalents; they simply refer the user to their synonyms which have equivalents.

The next step was the compilation of the eliciting dictionaries. Except for Filipino, the selected English entries were not directly used to elicit their equivalents in any of the Philippine languages. Instead these entries were translated first into Filipino to produce an *English-Filipino Dictionary* which was used as the first eliciting dictionary. This bilingual dictionary was in turn translated into the three major regional lingua francas, namely Sebuano, Ilokano and Hiligaynon, and later into the fourth major regional lingua franca, namely Tausug, thereby producing four trilingual dictionaries. The bilingual dictionary and the four trilingual dictionaries

were the instruments used separately to elicit as well as to check the equivalents of the English entries from the Philippine languages other than Filipino and the four regional lingua francas. On the other hand, the *English-Filipino Dictionary* was used not only to elicit but also to check the equivalents from the four major regional lingua francas.

The equivalents collected from each language were next encoded into our computers on fifteen to seventeen 5-1/4" DSDD (360K) diskettes with their corresponding English entries but without the corresponding equivalents from Filipino and any of the regional lingua francas. This process generated the basic file of each of the Philippine languages which is in the form of a bilingual dictionary with English as the source language and the Philippine language as the target language.

At present, we have collected and encoded into our computer using Dbase III+ equivalents from more than 100 languages. Printouts of these equivalents have been produced and checked not only against the corresponding English entries but also against the corresponding equivalents from Filipino alone or from Filipino and one regional lingua franca. After all the equivalents from all the languages shall have been checked, they shall be merged into one file, thereby producing the composite universal dictionary of Philippine languages. This file will later be transferred to the Ventura Publisher program which will be used in editing and printing the final draft of the dictionary on a laser printer.

In the final draft of the dictionary each entry will consist of an English main entry followed by the abbreviation of the part of speech to which it belongs. The Filipino equivalent or equivalents of the English entry preceded by FIL will follow immediately the part-of-speech abbreviation and the gloss if it is given. The equivalents from the other languages preceded by their language abbreviations will follow one after the other in a column starting on the line following the Filipino equivalents; they will be arranged in accordance with the alphabetical order of their language abbreviations. Example:

rice, n.1. (plant) FIL palay.
 ABK paray.
 ABL padáy.
 ADS ommóy.
 AGT paray.
 AKL paʔay.
 ALN paray.
 AMB pali.
 ATA paloy.
 BGK page.
 BHD fayay.
 BKL paroy.
 BLO pagoy.
 BOL pari.
 etc.

Some entries, as we mentioned earlier, will have no equivalents appearing after them; they will simply refer the user to their synonyms which have equivalents.

The camera-ready copy of the final draft of the dictionary which will be printed by the Ventura Publisher program on a laser printer will be given to the printing company that will be chosen to print the dictionary. The dictionary is expected to come out in about forty or more volumes with each volume having 1000 pages.

I now conclude this report with the following remarks. There still remain many languages whose equivalents have to be checked and/or rechecked one by one. Also there still remain a few languages from which equivalents have not been collected because of our inability to get any of their speakers. Our biggest task at present, however, is no longer the task of looking for language speakers and collecting equivalents but rather the task of checking and rechecking the collected equivalents. This latter task requires so much time, endurance, concentration and above all unflagging dedication. Nevertheless, despite the unavoidable travails, the personnel of the project and myself feel very confident that we will be able to finish the project and produce a camera-ready copy of the dictionary entitled *A Universal Dictionary of Philippine Languages* with more than 20,000 sets of equivalents from at least 105 languages which will be ready for printing the year following next year.

APPENDIX

Software Used in Dictionary Processing

1. DBASE.EXE (dbase III+)

USAGE: a) To create data structures of dictionary files.
b) To edit/update data structures.

2. DIC.EXE (with auxillary programs and subprograms)

Auxillary Programs:

2.1 MS.EXE/CC.EXE

Subprograms:

A. MPRINT.CCM	D. SLANG.CCM	G. SMPRINTS.CCM	J. STAR. PRT
B. MPRINTSC.CC	E. EPSON.PRT	H. MMPRISC.CCM	
C. ELANG.CCM	F. SMPRINT.CCM	I. MMPRISC2.CCM	

2.2 GEN.EXE/PRINT.EXE

2.3 ED.EXE

USAGE: a) Merging b) Encoding c) Sorting d) Printing draft

3. FEP.EXE

USAGE: File maintenance program.

4. SCP.EXE

USAGE: To convert character/characters into another.

5. CONVERT.EXE

USAGE: Convert database dictionary files into ASCII text files to be used in WordPerfect, Ventura Publisher, etc.

6. WP.EXE (WordPerfect 4 and 5)

USAGE: To prepare dictionary files prior to publication.

7. VENTURA PUBLISHER

USAGE: To print dictionary for camera-ready copy.

8. MAIN.EXE (old program used in dictionary processing)

9. REVERSE.EXE (with subprograms)

Subprograms:

A. REVFMT1.CCM	B. REVFMT2.CCC	C. REVPRI.CCM	D. SPACE.CCC
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USAGE: a) Reverse dictionary entries. b) Print reversed dictionary.

10. SRT.EXE

USAGE: Sort reversed dictionary.

11. **WS.EXE (WordStar 4)**

USAGE: To edit/update reversed dictionary.

12. **NDD.EXE**

USAGE: To fix defective diskettes and files.

13. **PATROL.EXE/SCAN.EXE**

USAGE: To trace existence of viruses and wiping them out.

14. **KILLER.COM**

USAGE: To wipe out MICROBE, PENTAGON and (C)BRAIN viruses.

15. **SERUM.COM/VIRUSTSR.EXE/ANTI.EXE**

USAGE: To protect hard disks and diskettes against viruses.

16. **PCT.EXE/QU.EXE**

USAGE: To recover accidentally deleted files.

17. **PKARC.COM/PKXARC.COM**

USAGE: To compress files and to extract it back.

18. **CLIPPER.EXE/TLINK.EXE/PLINK86.EXE**

USAGE: To compile all application programs written in dbase III+ or clipper and linking them to make each stand alone or an executable program.

19. **PFM.COM/ATTRIB.COM**

USAGE: a) To protect files against accidental deletion.
b) To unprotect files.