

ON IMPROVING OPERATION AND USE OF THE  
ELEFAN PROGRAMS. PART IV. CONCLUSION

by  
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In the final paper of this series, I shall contrast three basic attitudes one can take with respect to software such as the ELEFAN programs, rather than concentrate on another single problem and on approaches to fixing it, as was done in the three earlier parts of this series.

One school of thought with regard to the ELEFAN programs argues as follows: (1) tropical fish spawn continuously, hence any length-based method of growth analysis must fail; (2) if (1) doesn't apply, then the peaks one sees might still not reflect growth, and will be biased by gear selection and other things; (3) if (2) doesn't apply, then the "best" growth curve ELEFAN I traces is still not credible because it doesn't hit all peaks visible in the data; (4) if (3) doesn't apply then how does one know the fish grow according to von Bertalanffy?; and (5), if (4) doesn't apply then why bother to use a computer since the growth curve could have been traced by eye? [Needless to say, this line of argument is here much simplified; actually, it usually folds several times onto itself.]

There is also another line of "thought" - or of lack thereof with regard to the ELEFAN programs. It consists of simply running one's data through the ELEFAN system, getting "estimates" of  $L_{\infty}$ ,  $K$ ,  $Z$ , etc., and publishing the lot with some references to "Pauly et al", but without one's own thinking and without checking whether the assumptions of the model(s) behind the programs are met. Thus, I have seen

ELEFAN growth curves fitted to length-frequency data obtained, for example, with gill nets and from which zero modal progression was apparent; or growth curves fitted, almost maliciously, to inadequate data and Pauly blamed for the lack of fit.

There is, fortunately, a third school of thought, represented by people genuinely interested in the problems associated with estimating vital statistics of fish and invertebrates from size-frequency data, and hence interested in any methods, including the ELEFAN programs, which might help them in their work.

Representatives of this approach are e.g. Gary Morgan at the Kuwait Institute of Scientific Research, who found ways to perform simultaneous analysis of length and age data compatible with modified ELEFAN I (see Fishbyte 3(1)), Liew Hock Chark who wrote a program adding high-resolution graphics to ELEFAN I and II (Fishbyte, this issue), Thomas Brey, of Kiel University, Fed. Rep. of Germany, who modified ELEFAN I for application to benthic invertebrate with a long winter period of growth stagnation, or Djiby Thiam, who debugged and improved a version of ELEFAN I written in FORTRAN for use on mainframe computers (Fishbyte, this issue).

These four colleagues - representative of a larger group whom I cannot introduce in its entirety - turned their dissatisfaction with aspects of the ELEFAN programs into something more than a sterile trading of recriminations; they improved what they didn't like.

There are also quite a few things that I don't like about these programs, and we are in fact now sending replacement diskettes to over 50 users who had received IBM PC or Apple II (CP/M) diskettes that included "bugs." These versions are compiled, which should meet the complaints about the slowness of ELEFAN I when run on a microcomputer. We are trying...

