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## THE COSTS OF PRIMARY JOURNALS: A REVIEW

By

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## 1. INTRODUCTION

The 18th Session of the Indo-Pacific Fishery Commission (IPFC) reviewed a recommendation by the IPFC Executive Committee that IPFC should start publication of a journal for papers produced by scientists of member countries. During the discussion on the recommendation, views were expressed that (1) not enough thought had been given to the recommendation, (2) the costs mentioned to publish such a journal were much too small for a high-quality publication, (3) publishing a journal was a tremendous undertaking that could not be engaged in lightly, and (4) more information was needed on the subject.

A primary journal has been defined as one in which the results of new research are published (Committee on Scientific and Technical Communication, 1970). The publication recommended by the Executive Committee is assumed to be a primary journal.

The purpose of this paper is to review the costs of publishing a primary journal and thereby answer some of the questions raised on publications at the 18th Session. This review was based entirely on the literature and no attempt was made to obtain data directly from any journal publishers. In analyzing the operations of scientific journals, some researchers make a distinction among society, university, and commercial

publishers (Leeson, 1978). The publication proposed by the Executive Committee would presumably be more similar to those published by society and university than to commercial publishers. No papers on publications costs in countries other than the United States of America were consulted; thus the results of the view only reflect conditions in the U.S.A.

## 2. THE ROLE OF PRIMARY JOURNALS

Herwald (1967) stated that the basic function of a professional society is the interchange of information, which is done in two basic ways--at meetings and through publications. Journals or publications also have other characteristics or roles. Briefly, they have a current awareness role, that is, in keeping researchers in a field aware of advances made by others, and an archival role. In an archival role they provide the full text of new knowledge that is complete enough to satisfy most users, the material is under orderly bibliographic control and is quickly available in any well-maintained collection. However, because of the many problems of primary journals researchers have wondered whether such journals are anachronisms and should be replaced by other modes of storage and communication of information. This view was rejected on the basis that the growth in the number of journals showed that users (subscribers) are still interested in them and that while new modes of communication offered exciting possibilities they still had to be used in conjunction with journals (Committee on Scientific and Technical Communication, 1970).

## 3. GENERAL PROBLEMS IN JOURNAL ECONOMICS

Although the importance of the problems of journal economics has long been recognized, it has been noted that as relatively recently as 1969 there

were limitations in the understanding of the economics of journal publications and that few technical societies publishing journals knew their detailed publication costs (Herwald, 1967; Committee on Scientific and Technical Communication, 1969). While there is contradictory evidence on the proliferation of journals (Leeson, 1978), many investigators comment on the "technical information explosion" and the financial problems associated with it, particularly with regard to society publications (Herwald, 1967). A cursory survey of the fishery literature indicated that the IPFC countries have contributed to the proliferation of scientific and technical journals (Table 1). It should be noted that Table 1 only includes fishery publications. Stewart (1963) was struck by the large number of journals in biology as compared with that in the physical sciences and noted that each biology journal served fewer scientists as shown by circulation figures.

Publishers of primary journals have been concerned about meeting their responsibilities in the face of the "information explosion" and the constantly changing needs of scientists, a concern which has been reflected primarily in meeting the cost of publishing (Kuney, 1963). Numerous ways to reduce or balance the cost of publishing have been suggested including ways to reduce cost in the printing and editorial sectors, increasing society dues, increasing the advertising carried, adding page charges, reducing the number of pages published, and changing the physical quality of the journal, e.g. changing from glossy paper stock to a less-expensive stock (Lee, 1954; Herwald, 1967). Koch (1969) suggests that the "federation concept" and the "page charge concept" are the most important operational concepts basic to the favorable operation of the American Institute of Physics (AIP). The

AIP performs communal operations that provide benefits resulting from centralized operations for the member societies in the federation. Page charges were established by AIP to be an equitable contribution by the authors' institutions to cover most of the editorial and composition costs of the pages published for authors.

#### 4. PRODUCTION COSTS OF JOURNALS

The costs of producing a journal can be broken down basically as prerun costs and runoff costs. Included in the prerun costs are costs associated with editorial work, copy editing, composition, proofreading, and engraving. Runoff costs include costs associated with paper and presswork, binding, wrapping, mailing, and monitoring files of subscribers. There may also be optional costs, i.e. costs of operations that are not directly related to the publication of research results but are considered desirable adjuncts, such as preparation and printing of advertising and news material or production of reprints and back-number stocks (Committee on Scientific and Technical Communication, 1970). The prerun and runoff costs of nine AIP journals for the period 1964-69 are shown in Table 2.

Stewart (1963) cited cost figures for the production of 124 biological journals in 1959. Assuming a cost of \$20 per page, she estimated that the 106,700 pages published in 1959 cost \$2,192,000 or \$17,700 per journal. She also noted that using the cost figure of \$70 per page estimated by the Federation of American Societies for Experimental Biology an estimate of \$7,500,000 or \$60,500 per journal would be obtained.

## 4.1 Prerun Costs

### 4.1.1 Editorial work

Under editorial work can be listed technical editing which includes editors, clerical staff, referees, telephone, postage, etc. Some items under editorial work are often referred to as "hidden costs" of journal production. Technical editing and refereeing are a significant item in the prerun costs of producing a journal and although editors are often paid, they frequently are not. Even when editors are paid, their remuneration may not be commensurate with the value of the time they devote to their journals.

#### 4.1.1.1 Technical editing

Usually, editors are on the staff of a university or other institutions who devote part time to the journal. A 1968 survey showed that in a subset of 36 journals having part-time editors, 24 were paid a stipend and 12 were not (Committee on Scientific and Technical Communication, 1970). This same study showed that the average compensation for editors who received stipends was around \$3,000 per million published words. Stewart (1963) found that 34% of the editors of biological journals were paid (amount not specified). These editors spent an average of 779 hours per year on their journals.

#### 4.1.1.2 Refereeing

Although some journals of private publishers provide an honorarium, referees usually donate their services. The Committee on Scientific and Technical Communication (1970) estimated that the amount of refereeing time per paper refereed was of the same order as the amount of editorial time per paper published.

Koch (1969) noted that for the AIP operations the most significant policy procedure relating to journal quality was the referee system. He found that refereeing, on the average, consumed about half the average total time of 6 months required from the time a manuscript is submitted to the scientific editor to the time it is published.

#### 4.1.1.3 Copy editing

Copy editing is the preparation of manuscripts for the typesetter or other compositor and includes the marking of manuscripts for the typesetter, standardizing headings, footnote arrangement, planning the layout of figures and tables, and some proofreading. Usually most or all of these functions are done at the journal production office, but sometimes they may be done at the technical editor's office and others may be done sometimes by the printer. The 1967 cost (including overhead) of the "editorial mechanics" for a number of scientific and engineering journals and university presses was found to range from about \$7.50 to over \$28 per 1,000 equivalent words. The cost for most organizations was in the range of \$12 to \$16 (Committee on Scientific and Technical Communication, 1970).

#### 4.1.1.4 Composition

Composition costs depend basically on whether the journal is set in type or photo-offset from copy prepared on special typewriters in the offices of the journal. Costs of composition are also influenced by the difficulty of the material being set and may differ from printer to printer. In comparing the costs of composition itself, i.e., corrections made to proof and engravings, the costs in 1968 using domestic typesetters were usually in the range of \$30 to \$40 per thousand equivalent words, depending

noticeably on the amount of mathematics and special symbols involved. Typewriter and photo-offset composition seemed to cost only two-thirds of that for domestic typesetting (Committee on Scientific and Technical Communication, 1970). The Committee also noted that some European typesetters seemed to charge as little as two-thirds the domestic rate and those in the Far East even less.

#### 4.2 Runoff Costs

Basic runoff costs include expenses for paper and presswork, binding, wrapping, mailing, monitoring files of subscribers, and other related items (see e.g. Table 2). The Committee on Scientific and Technical Communication (1970) compared the size of an average issue of the journal with specific runoff costs including (a) printing, paper, and postage, (b) covers, wrapping, and mailing, and (c) maintenance of records and other information on subscribers. The runoff costs in cents per thousand equivalent words per subscriber generally decreased with an increase in thousands of equivalent words per issue.

### 5. SUMMARY

The motivation for this paper surfaced at the 18th Session of the IPFC during discussions on a recommendation by the Executive Committee that IPFC sponsor a publication. The purpose of this paper is to briefly review some of the costs associated with publishing a primary journal.

The role of primary journals and general problems in journal economics were briefly discussed. Basic production costs of journals have been basically categorized as prerun costs and runoff costs. Prerun operations include editorial work, copy editing, composition, proofreading, engraving,

and related functions. Runoff operations include functions related to presswork and cost of paper, binding, wrapping, mailing, monitoring files of subscribers, etc. Production cost items were discussed in varying degrees of detail and some examples of total cost figures for primary journals were presented.

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TABLE 1. Fishery publications of Indo-Pacific Fishery Commission countries and international/private foundations or organizations associated with IPFC countries

Country	Technical	Types	Semitechnical
<u>IPFC Countries</u>			
AUSTRALIA			
Fisheries Division, Department of Primary Industry			Australian Fisheries (monthly)
Commonwealth Scientific and Industrial Research Organization (CSIRO)	Australian Journal of Marine and Freshwater Research (bimonthly)		
CSIRO Division of Fish and Oceanography	Circular (irregular), e.g. Workshop on lobster and rock lobster. Circ. 7, 1977		
Do		Fisheries synopsis (irregular), e.g. Synopsis of biological data on banana prawn.... Fish. Synop. (8), 1970	
Do		Report (irregular), e.g. Hydrological features of a warm core eddy and their biological implications. Rep. 100, 1978	
DO		Research Report 1974-77. [Annual report.]	
CSIRO Marine Biochemistry Unit			Annual Report
BANGLADESH			
BURMA (Socialist Republic of the Union of)			

TABLE 1. (Continued)

	Country	Types	
		Technical	Semitechnical
FRANCE			
	Office de la Recherche Scientifique et Technique Outre-Mer (ORSTOM)	CAHIERS. ORSTOM Oceanographie (quarterly)	
	Institut Scientifique et Technique des Peches Maritimes	Revue des Travaux de l'Institut des Peches Maritimes (quarterly)	
INDIA			
	Ministry of Food and Agriculture	Indian Journal of Fisheries (semi- annual)	
	Indian Council of Agricultural Research, Central Marine Fisheries Research Institute (CMFRI)	CMFRI Bulletin (irregular) CMFRI Special Publication (irregular)	Marine Fisheries Information Service (CMFRI)
INDONESIA		CMFRI Annual Report	CMFRI Newsletter
	Lembaga Oseanologi Nasional. Lembaga ilmu Pengetahuan Indonesia	Marine Research in Indonesia (irregular) Oceanographical cruise report (irregular)	

TABLE 1. (Continued)

Country	Technical	Types
JAPAN		
Ministry of Agriculture and Forestry	Fisheries Statistics of Japan (in English) (annual)	
	Statistical Data (in Japanese) (annual)	
Fishery Agency. Research and Development Department	Annual Report of Effort and Catch Statistics by Area on Japanese Tuna Longline Fishery (annual)	
	Annual Report of Effort and Catch Statistics by Area on Japanese Skipjack Baitboat Fishery (annual)	
Oceanic Fishery Department	Fishing Boat Laboratory. Technical Report of Fishing Boat (irregular)	
Far Seas Fisheries Research Laboratory	Bulletin of the Far Seas Fisheries Research Laboratory (irregular)	
	S Series (irregular)	
KOREA		
Fisheries Research and Development Agency	Annual Report of Oceanographic Observations (annual)	
	Bulletin (annual)	
MALAYSIA		

TABLE 1. (Continued)

Country	Types	
	Technical	Semitechnical
NEW ZEALAND		
Ministry of Agriculture and Fisheries. Information Services		Catch '80 (monthly)
Fisheries Management Division	Fisheries Technical Report (irregular)	
Fisheries Research Division	Fisheries Research Bulletin (irregular)	
	Occasional Publication (irregular)	
Department of Science and Industrial Research. New Zealand Oceanographic Institute (NZOI)	Contribution (irregular)	
	Memoir (irregular)	
	Miscellaneous Publication (irregular)	
	NZOI Records (irregular)	
	Coastal Series Charts (irregular)	
PHILIPPINES		
Bureau of Fisheries and Aquatic Resources	Fisheries Statistics of the Philip- pines (annual)	Fisheries Newsletter (quarterly)
	Philippine Journal of Fisheries (semiannual)	Fisheries Today (quarterly)
SRI LANKA	Bulletin of the Fisheries Research Station, Sri Lanka (Ceylon) (semi- annual)	
THAILAND		
Ministry of Agriculture and Coopera- tives. Department of Fisheries	Phuket Marine Biological Center. Research Bulletin (irregular)	

TABLE 1. (Continued)

Country	Types	
	Technical	Semitechnical
UNITED KINGDOM		
Ministry of Agriculture, Fisheries and Food	Fishery Investigations, Series II (irregular)	
	Fisheries Research Technical Report (irregular)	
	Laboratory Leaflet (irregular)	
	Report of the Director of Marine Fisheries Research	
Institute of Oceanographic Sciences	Collected Reprints (annual)	
	Annual Report	
UNITED STATES OF AMERICA		
National Marine Fisheries Service	Fishery Bulletin, U.S. (quarterly)	Marine Fisheries Review (monthly)
	Report of the National Marine Fisheries Service (annual)	
	Statistical Digest (annual)	
	NOAA Technical Report NMFS Circular (irregular)	
	NOAA Technical Report NMFS SRRF (irregular)	
VIETNAM (Socialist Republic of)		

TABLE 1. (Continued)

Country	Types	
	Technical	Semitechnical
	<u>International/Private Foundation or Organizations</u>	
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS		
Indian Ocean Fishery Commission (IOFC)	IOFC/DEV/Programme Publications (irregular)	
	IOP/TECH (Technical Reports) (irregular)	
IPFC	Proceedings (biannual)	IPFC Newsletter (irregular)
	Occasional Papers (irregular)	
	Regional Studies (irregular)	
	Special Publications (irregular)	
United Nations Development Programme (UNDP) South China Sea Fisheries Development and Coordinating Programme	Fisheries Technical Papers (irregular) SCS/DEV/___	
	Manuals - SCS Manuals (irregular)	
	Working Papers - SCS/yr/WP___ (irregular)	
	Coordinating Committee Reports (irregular) - SCSP: yr/no/REP___	
	Workshop Reports - SCS/GEN/___ (irregular)	
	Periodic Progress Reports - SCS/PR/___	

TABLE 1. (Continued)

Country	Types	
	Technical	Semitechnical
INTERNATIONAL CENTER FOR LIVING AQUATIC RESOURCES MANAGEMENT (ICLARM)	Studies and Reviews (irregular)	ICLARM Newsletter (quarterly)
INTER-AMERICAN TROPICAL TUNA COMMISSION (IATTC)	Conference Proceedings (irregular)	
	Annual Report	
	Bimonthly Progress Report	
	Bulletin (irregular)	
	Data Report (irregular)	
SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER (SEAFDEC)	Internal Report (irregular)	
	Special Report (irregular)	
Aquaculture Department	Annual Report	
	Quarterly Research Report	
	Technical Report (irregular)	
	Extension Manual (irregular)	
Marine Fisheries Research Department	Report (annual)	
Secretariat		SEAFDEC Newsletter (irregular)



TABLE 1. (Continued)

Country	Types	
	Technical	Semitechnical
SOUTH PACIFIC COMMISSION (SPC)	Annual Report	SPC Fisheries Newsletter (irregular)
	Bulletin (quarterly)	SPC Monthly news of activities (monthly)
	Occasional Paper (irregular)	
	Report (annual)	
	Skipjack Survey and Assessment Programme (annual; interim)	
	Statistical Bulletin (irregular)	
	Technical Paper (irregular)	

TABLE 2. Consolidated prerun and runoff costs for nine American Institute of Physics journal  
(adapted from Koch, 1969)

	1964	1965	1966	1967	1968	1969
			<u>Prerun Costs</u>			
Income						
Page charge	\$680,661	\$783,026	\$ 858,609	\$1,044,794	\$1,057,283	\$1,164,050
Conference contribution	6,500	12,000	9,000	17,800	32,097	10,000
Expense						
Composition and authors' alterations	\$479,012	\$582,518	\$ 657,609	\$ 704,492	\$ 733,991	\$ 788,100
Engravings	63,273	71,188	86,350	95,936	101,352	104,200
Editorial management	136,836	124,477	137,131	146,453	165,913	172,450
Editorial mechanics	106,358	122,104	141,126	173,444	212,267	233,600
Cost of free reprints <sup>1</sup>	40,069	45,236	50,427	55,045	56,979	65,150
Order handling charge <sup>1</sup>	8,576	15,588	18,104	18,308	22,478	27,650
	\$834,124	\$961,111	\$1,090,747	\$1,193,678	\$1,292,980	\$1,391,150
Statistical Data						
Number of text pages (including blanks and covers)	18,129	20,613	22,636	24,799	26,153	26,232
Text pages less 2%	17,766	20,201	22,183	24,283	25,630	25,707
Input cost/corrected page	\$46.95	\$47.58	\$49.17	\$49.16	\$50.45	\$54.12
			<u>Runoff Costs</u>			
Income						
Subscriptions	\$608,445	\$639,711	\$654,267	\$785,826	\$788,057	\$792,750

TABLE 2. (Continued)

	1964	1965	1966	1967	1968	1969
Expense						
Printing } Mailing }	\$329,467	\$371,609	\$411,294	\$458,820	\$410,737	\$433,700
Subscription handling	83,524	71,624	66,392	68,512	93,019	99,300
Circulation promotion	5,452	6,895	3,884	230	71,433	74,650
Total	\$418,443	\$450,128	\$481,570	\$527,562	\$575,189	\$607,650
Statistical Data						
Number of text pages (including blanks and covers)	18,129	20,613	22,636	24,779	26,153	26,232
Text pages less 2%	17,766	20,201	22,183	24,283	25,630	25,707
Output cost/corrected page	\$23.55	\$22.28	\$21.71	\$21.73	\$22.44	\$23.64

<sup>1</sup>Estimated.