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The Most Cited Serials in BIOLOGICAL ABSTRACTS in 1960

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College and university libraries have followed various methods of selecting scientific materials for their serials collections. Beyond the needs of the curriculum and faculty requests, the staffs of research libraries have developed serials collections using Ulrich's Periodicals Directory, index and abstract coverage lists, and the "most cited" lists formulated by the late Charles H. Brown and others.¹ The present study of the "most cited" serials in Biological Abstracts is offered as an additional method to assist the development of serials collections in the biological sciences.

Biological Abstracts is among the world's leading abstract services in the areas of agriculture, biology, and medical science. The "List of Serials Abstracted" published in the October 15, 1960, issue included nearly 5,000 titles according to the statements of the publishers. The 24 issues in 1960 contained 72,532 entries, listing both monographic and serial literature. Each of these entries was examined in this study. A tabulation was made to determine the number of times each serial was cited in the 1960 issues. A summary of the results of this survey is given in Table I.

Citations of Soviet serials in both Russian- and English-language editions were combined and listed under the Russian title. An exception was made for the serial Akademiia nauk SSSR. Doklady. The English translations of the biochemical, biological, and botanical sections of Doklady appear separately. No attempt was made to discover whether or not citations of the Russian edition and of the translated sections actually referred to the same articles. Citations of a serial and its supplements were combined. New serials were added to the coverage list as they were

cited. Wherever possible, serials have been recorded in Appendix A in the form used in the Union List of Serials and New Serial Titles.

The designation of "most cited" instead of "most abstracted" serials has been used in this study. Although no exact count was made, there are probably 10,000 to 12,000 entries in 1960 not accompanied by abstracts, or approximately 15 per cent of the total 72,532 entries. "Cited only" entries were especially common among the higher ranking serials in the most cited list. The most cited serials in the highest ranking 100 positions are noted in Appendix A.

Serials with predominantly English-language content almost monopolize the most cited list, particularly among the first 150 titles. Of the 143 serials ranking in the first 100 positions, 105 or 73 per cent are largely of English-language content. The balance of these 143 serials by country of publication includes fourteen from Russia, ten from Japan, five from France, four from Scandinavia, three published in Germany, three in Italy, and one each from China, Czechoslovakia, and Switzerland. Even some of these titles carry research articles in English. All of the 14 Russian titles are available in English editions. This is, no doubt, the reason that they appear near the top of the list. Almost all of the high ranking serials are commonly found in the collections of university and research libraries.

Only one journal among the 143 would be difficult to locate. It is the Giornale di Malattie Infettive e Parassiatrice, which is listed in the 1959 edition of New Serial Titles as "not retained" by the Library of Congress. No other library reported holdings for the 1959 volume. The issues of New Serial Titles for 1960 and 1961 were also examined, but the title was not listed.

As the following table indicates, the 143 serials ranking in the highest 100 positions on the most cited list account for almost half of the contents in Biological Abstracts during 1960.

TABLE I

<u>Rank</u>	<u>No. of Titles</u>	<u>Citations</u>	<u>Per Cent of 72,532*</u>
1-25	25	17,264	23%
26-50	30	7,091	10
51-75	33	5,286	7
76-100	55	6,333	9
Totals:	143	35,974	49%

*Total number of entries for 24 issues of Biological Abstracts in 1960.

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As has been noted previously, the Biological Abstracts "List of Serials Abstracted" records nearly 5,000 titles. This study discovered, however, that 1,635 serials in this coverage list were not abstracted or cited in the 1960 issues. Thus, 30 per cent of the titles supposedly covered by the service were completely omitted. One would expect the omission of irregular serials or those titles containing few biological articles. However, some of the titles omitted are among the leading scientific journals in the world. For example, the Comptes Rendus of both the Académie des Sciences and the Société de Biologie were omitted from the 1960 issues. Other outstanding French serials were also among the "not cited." Biological Abstracts failed to list material published in several genetics journals, such as Acta Genetica et Statistica Medica, Bibliographia Genetica, Caryologia, Genetica, and Zeitschrift für Vererbungslehre. Several German serials of international reputation also appear in the "not cited" list. A few such titles are Archiv für Protistenkunde, Pflüger's Archiv. . . , Planta, and Zentralblatt für Bakteriologie. . . .

In addition to the "most cited" and "not cited" serials is a very large group of titles being selectively covered. There are probably about 3,000 titles in this category. A few examples will indicate the quantity of biological research not being reported. The British journal Annals of Human Genetics publishes about 40 articles each year. In 1960 this title was cited only once. Naturwissenschaften, a respected German publication, was cited only twice in the 1960 issues of Biological Abstracts. The Transactions of the Royal Entomological Society of London, which publishes approximately 15 articles each year, was cited only once. Other publications of substantial international reputation, such as the American Journal of Roentgenology, American Medical Association Journal, Anatomischer Anzeiger, Audubon Magazine, Avian Diseases, Journal of Tropical Medicine and Hygiene, Parasitology, and Société Zoologique de France Bulletin, were all cited fewer than five times each in 1960.

Librarians have always found that the arrangement of coverage lists makes them very difficult to use. The present form of the "List of Serials Abstracted" makes its use for checking serials holdings in a library almost impossible. Some entries in the coverage list are so different from the Union List of Serials or New Serial Titles form that their positive identification is difficult. Confusion is further compounded by the use of the same abbreviation for two or more serials. "Rev. Biol." could refer to three or four different titles. The Biological Abstracts coverage list also contains numerous duplicate listings. Several examples are Bulletin Welch Plant Breeding Station and Welch Plant Breeding Station Bulletin; Biophysical Society Symposium and Symposium of the Biophysical Society; and Iowa Agricultural Experiment Station Research Bulletin and Research Bulletin Iowa Agricultural Experiment Station. The coverage list could be edited to delete duplicate listings, remove serials no longer published, and correct spelling errors. Important serials such as Advances in Genetics,

Advances in Cancer Research, and Zuchter should be added to the list.

No attempt was made in this study to determine the delay between the publication of research and the appearance of the abstract. A 1954 study of Bentley Glass indicated the delay at that time to be from seven to eleven months for American and British material, and from 12 to 24 months for European research.² The present study did note the appearance in 1960 of abstracts for research originally published in 1955 through 1960. Occasionally, several years of a serial were abstracted in the same issue. Some examples will show that this delay in abstracting is sometimes very great, even for American material. The 1959 volume of Cold Spring Harbor Symposia was distributed to libraries in January 1960. Articles in this volume were abstracted in Biological Abstracts for October 1, 1961. Articles published in Genetica in 1956, 1957, 1958, and 1959 were cited in the October 15, 1961, issue. Genetica was one of those titles not cited during 1960.

The recent study by Melvin J. Voight noted that the scientist's greatest literature problem is that of locating research in current publications.³ If abstracts are being published up to sixty months after the original research, such a service cannot satisfy this current need. Considering the scope of scientific publishing, it may be that producing an extensive abstract in the middle of the twentieth century is wishful thinking. Abstracting services may be possible only in the smaller subject areas such as genetics, mycology, and entomology. If the annual cost of publishing a 100,000 entry abstract is put at \$600,000, it might be possible to publish a very comprehensive biological index of, say, 250,000 citations for the same figure. Given this choice, the world's biologists might be expected to accept the more complete coverage of a current index. An index could easily publish citations within six months after the original publication. The value of Biological Abstracts as a retrospective bibliography is greatly diminished because of the very selective listing from hundreds of serials. If neither the current nor the retrospective needs of the scientists are fulfilled, then surely it is time to attempt to satisfy one or the other.

The present circulation of Biological Abstracts is approximately 6,900,⁴ and the total 1960 circulation revenue was \$504,000, according to G. Miles Conrad, Director of Biological Abstracts.⁵ If institutional subscriptions are providing the bulk of the support, then it appears that these subscribers should get the kind of literature service needed by their patrons. University libraries are now paying a net price of \$180 a year for the complete Biological Abstracts. Many libraries would be willing to pay much more for the type of service being demanded by researchers.

The serials to be covered by Biological Abstracts should be selected by the circulation of a coverage list to the subscribers. It certainly must be possible to agree upon a group of a few thousand titles to be covered

completely by the service. The balance of the world's biological literature could be handled by the Bibliography of Agriculture, Index Medicus, and Zoological Record.

A coverage list, arranged according to the entries in the Union List of Serials and New Serial Titles, would be more satisfactory to both the librarians and the scientists. Titles would then appear in the same form used in library catalogs and would thus aid both in the identification and in the loaning of serials.

The purpose of this study was to discover some method that might enable university and research libraries to develop more valuable serials holdings. There is certainly little purpose in building extensive serials collections for which the scientist finds little need or for which he lacks a guide to the contents. If the concept of "most cited" serials has any validity, then the list of the most cited serials in Biological Abstracts can be used to aid in this collection development. A complete file of each serial on the most cited list should be available for photoduplication or loan from a library in the United States. Many of the more important titles should be available in complete form at various regional locations. Physical accessibility might also be provided for the titles not among the most cited.

FOOTNOTES

1. Brown, Charles H. Scientific Serials (ACRL Monograph, No. 16). Chicago, American Library Association, Association of College and Reference Libraries, 1956.

Gross, P. L. K. and Gross, E. M. "College Libraries and Chemical Education," Science, 66: 385-389, 1927.

Morgan, M. B. "Characteristics of the Periodical Literature of Physiology Used in the United States and Canada," American Journal of Physiology, 191:416-421, 1957.

Brodman, Estelle. "Choosing Physiology Journals," Medical Library Association Bulletin, 32: 479-483, Oct. 1944.

2. Glass, Bentley. "A Survey of Biological Abstracting," AIBS Bulletin, 5: 20-24, Jan. 1955; 5:18-21, April 1955.

3. Voight, Melvin J. Scientists' Approaches to Information (ACRL Monograph, No. 24). Chicago, American Library Association, 1961.

4. McCallister, William F., ed. N. W. Ayer and Son's Directory of Newspapers and Periodicals, 1961. Philadelphia, N. W. Ayer and Son, 1961.

5. Conrad, G. Miles. Letter dated May 29, 1962.

APPENDIX A

A Partial Listing of the Most Cited Serials
in BIOLOGICAL ABSTRACTS, 1960*

<u>Citations</u>	<u>Serial</u>	<u>Rank</u>
2365	FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY. PROCEEDINGS	1
2204	NATURE (London)	2
2010	DISSERTATION ABSTRACTS	3
1154	BIOCHIMICA ET BIOPHYSICA ACTA	4
872	SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE. PROCEEDINGS	5
781	BIULLETIN' EKSPERIMENTAL'NOI BIOLOGII I MEDITSINY	6
590	JOURNAL OF BIOLOGICAL CHEMISTRY	7
553	NEW YORK ACADEMY OF SCIENCES. ANNALS	8
537	SCIENCE	9
517	SOCIETY OF AMERICAN BACTERIOLOGISTS. BACTERIOLOGICAL PROCEEDINGS	10
512	AMERICAN JOURNAL OF PHYSIOLOGY	11
490	FIZIOLOGICHESKII ZHURNAL SSR.	12
446	GIORNALE DI MALATTIE INFETTIVE E PARASSIATRIE	13
419	REFERATIVNYI ZHURNAL. BIOLOGIIA	14
381	BIOCHEMICAL JOURNAL	15
380	EXPERIMENTIA	16
368	JOURNAL OF CLINICAL INVESTIGATION	17
363	ARCHIVES OF BIOCHEMISTRY AND BIOPHYSICS	18
348	GASTROENTEROLOGY	19
344	JOURNAL OF ECONOMIC ENTOMOLOGY	20
334	BIOKHIMIJA	21
333	JOURNAL OF PHYSIOLOGY	22
329	PLANT PHYSIOLOGY	23
322	CANADA. FISHERIES RESEARCH BOARD. JOURNAL	24
312	ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII	25
296	AGRONOMY JOURNAL	26
295	INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, SECOND, 1958, PROCEEDINGS	27

*This listing contains only the titles, number of citations, and rank of the 143 serials which appeared in the 100 highest ranking positions.

<u>Citations</u>	<u>Serial</u>	<u>Rank</u>
294	ARCHIVES INTERNATIONALES DE PHARMACODYNAMIE ET DE THERAPIE	28
277	JOURNAL OF BACTERIOLOGY	29
269	VOPROSY ONKOLOGII	30
267	JOURNAL OF NUTRITION	31
258	CANCER RESEARCH	32
252	U. S. DEPARTMENT OF AGRICULTURE. PLANT DISEASE REPORTER	33
249	ENTOMOLOGICHESKOE OBOZRENIE	34
247	JAPANESE JOURNAL OF VETERINARY SCIENCE	35
243	ENDOCRINOLOGY	36
239	JOURNAL OF APPLIED PHYSIOLOGY	37
239	CIRCULATION	37
237	AKADEMIIA NAUK SSSR. DOKLADY	38
231	POCHVOVEDENIE	39
228	EXPERIMENTAL CELL RESEARCH	40
228	HIROSAKI MEDICAL JOURNAL	40
228	PHYTOPATHOLOGY	40
223	ANNALS OF INTERNAL MEDICINE	41
222	OBSTETRICS AND GYNECOLOGY	42
218	ANATOMICAL RECORD	43
218	ANNALES BIOLOGIQUES	43
209	JOURNAL OF BIOCHEMISTRY	44
207	ACTA ENDOCRINOLOGICA	45
206	AMERICAN ASSOCIATION FOR CANCER RESEARCH. PROCEEDINGS	46
206	BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS	46
204	WORLD CONGRESS OF GASTROENTEROLOGY. PROCEEDINGS	47
202	ZHURNAL VYSSHEI NERVNOI DEIATEL'NOSTI	48
200	VIROLOGY	49
199	ANTIBIOTIC MEDICINE AND CLINICAL THERAPY	50
191	JOURNAL OF CLINICAL ENDOCRINOLOGY AND METABOLISM	51
191	JOURNAL OF IMMUNOLOGY	51
188	POULTRY SCIENCE	52
177	MIDROBIOLOGIIA	53
176	AMERICAN JOURNAL OF PSYCHIATRY	54
174	AMERICAN JOURNAL OF PUBLIC HEALTH	55
173	JOURNAL OF DAIRY SCIENCE	56
170	CROP SCIENCE SOCIETY OF JAPAN. PROCEEDINGS	57
170	IGAKU KENKYU	57
167	VOPROSY VIRUSOLOGII	58
166	U. S. NATIONAL CANCER INSTITUTE. JOURNAL	59
165	AMERICAN VETERINARY MEDICAL ASSOCIATION. JOURNAL	60

<u>Citations</u>	<u>Serial</u>	<u>Rank</u>
164	JOURNAL DE PHYSIOLOGIE	61
164	JOURNAL OF PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS	61
161	JAPAN. NATIONAL HYGIENIC LABORATORY. BULLETIN	62
160	JOURNAL OF BIOPHYSICAL AND BIOCHEMICAL CYTOLOGY	63
159	JOURNAL OF DENTAL RESEARCH	64
158	JOURNAL OF ANIMAL SCIENCE	65
158	QUEENSLAND SOCIETY OF SUGAR CANE TECHNOLOGISTS. PROCEEDINGS	65
156	AGRICULTURAL CHEMICAL SOCIETY OF JAPAN. BULLETIN	66
155	RADIATION RESEARCH	67
153	AMERICAN REVIEW OF RESPIRATORY DISEASES	68
152	CANADIAN JOURNAL OF BIOCHEMISTRY AND PHYSIOLOGY	69
152	PHYSIOLOGICAL SOCIETY OF JAPAN. JOURNAL	69
152	ZEITSCHRIFT FUR NATURFORSCHUNG	69
151	BIOFIZIKA	70
151	SOIL SCIENCE SOCIETY OF AMERICA. PROCEEDINGS	70
149	CANADIAN ENTOMOLOGIST	71
145	NEUROLOGY	72
142	JOURNAL OF FORESTRY	73
140	BULLETIN OF ENTOMOLOGICAL RESEARCH	74
138	CURRENT SCIENCE (India)	75
138	FOOD TECHNOLOGY	75
137	SCANDANAVIAN JOURNAL OF CLINICAL AND LABORATORY INVESTIGATION	76
136	AKADEMIIA NAUK SSSR. DOKLADY. BIOLOGICAL SCIENCES SECTION TRANSLATION	77
136	CANCER	77
136	NEW ENGLAND JOURNAL OF MEDICINE	77
135	CANADIAN JOURNAL OF ZOOLOGY	78
133	ACTA PATHOLOGICA ET MICROBIOLOGICA SCANDANAVICA	79
131	FIZIOLOGIJA RASENTII	80
131	JOURNAL OF PARASITOLOGY	80
130	ACTA PSYCHIATRICA ET NEUROLOGICA SCANDANAVICA	81
129	ENTOMOLOGICAL SOCIETY OF AMERICA. ANNALS	82
127	BLOOD	83
125	ECOLOGY	84
125	U. S. ATOMIC ENERGY COMMISSION. REPORT	84
124	ENDOKRINOLOGIE	85
123	INTERNATIONAL SCIENTIFIC TOBACCO CONGRESS	86
123	JOURNAL OF EXPERIMENTAL MEDICINE	86
123	U. S. AIR FORCE. WRIGHT AIR DEVELOPMENT CENTER. TECHNICAL REPORT	86
119	AMERICAN JOURNAL OF BOTANY	87
119	ANGIOLOGY	87
119	SCIENCE AND CULTURE	87

<u>Citations</u>	<u>Serial</u>	<u>Rank</u>
118	MONITORE ZOOLOGICA ITALIANO	88
118	NEW ZEALAND JOURNAL OF AGRICULTURAL RESEARCH	88
115	ISRAEL. RESEARCH COUNCIL. BULLETIN. SECTION E	89
115	WILSON BULLETIN	89
112	CANADIAN JOURNAL OF PLANT SCIENCE	90
112	CIRCULATION RESEARCH	90
112	JAPANESE FORESTRY SOCIETY. JOURNAL	90
112	JOURNAL OF NERVOUS AND MENTAL DISORDERS	90
112	SOIL SCIENCE	90
111	ANNALS OF BOTANY	91
111	BATILEYA	91
111	JOURNAL OF PALEONTOLOGY	91
111	JOURNAL OF RANGE MANAGEMENT	91
109	ACTA ALLERGOLOGICA	92
109	CANADIAN JOURNAL OF BOTANY	92
109	REVUE SUISSE DE ZOOLOGIE	92
109	U. S. PUBLIC HEALTH SERVICE. PUBLIC HEALTH REPORTS	92
108	ACTA ENTOMOLOGICA SINICA	93
107	AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE	94
107	FOLIA BIOLOGICA (Prague)	94
107	JAPANESE JOURNAL OF EXPERIMENTAL MEDICINE	94
107	LABORATORY INVESTIGATION	94
106	JOURNAL OF GENERAL MICROBIOLOGY	95
105	ANNALS OF APPLIED BIOLOGY	96
105	JOURNAL OF PATHOLOGY AND BACTERIOLOGY	96
104	AMERICAN JOURNAL OF DIGESTIVE DISEASES	97
104	BIOCHEMISCHE ZEITSCHRIFT	97
102	AETNEO PARMENSE	98
102	CONDOR	98
102	ELECTROENCEPHALOGRAPHY AND CLINICAL NEUROPHYSIOLOGY	98
102	SOCIETE FRANÇAISE DE DERMATOLOGIE ET SYPHILIGRAPHIE. BULLETIN	98
102	U. S. FISH AND WILDLIFE SERVICE. SPECIAL SCIENTIFIC REPORT	98
100	BRITISH JOURNAL OF PHARMACOLOGY AND CHEMOTHERAPY	99
100	NATIONAL ACADEMY OF SCIENCES (U. S.). PROCEEDINGS	99
99	QUARTERLY JOURNAL OF EXPERIMENTAL PHYSIOLOGY AND COGNATE MEDICAL SCIENCES	100

EDITOR'S NOTE

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