

The 25 Most Cited 1971 Papers Reveal a Great Deal About Research in 1971

Number 44 October 31, 1973

Recently, we published a list of the most cited 1972 papers. A comparable list of 1971 papers appears below. (NB: These are the 1971 papers most cited in 1971 and 1972.) Heavily cited papers published earlier than 1971 are not included. A list of 1970 papers will be published soon.

An interesting aspect of this list is the appearance of a fair number of non-biomedical papers. It is sometimes asserted that citation analysis introduces a bias towards the life sciences because of the sheer volume of biomedical literature. I won't attempt to explain it, but the papers by Sanders, Abarbanel, Brandt, Harari, etc., achieved citation distinction despite such a possible bias. I believe there is evidence here of the "infectious" nature of an important paper—an example of what Goffman would call bibliographical epidemiology.²

Another thing to note is that such highly cited papers appear invariably in a small group of leading journals. Thus, while *Nature* ranks only 185th among journals in terms of citation impact (number of citations per article published),³ it ranks here far above others in its attraction of papers of high citation distinction. Six of the 25 most-

cited 1971 papers appeared in Nature. This attraction of highly cited papers may be related to another characteristic of Nature, which I intend to develop more fully in the future. Again, in Goffman's framework, Nature is more infectious than a journal like Journal of the American Chemical Society. IACS is first in terms of total citations, and 36th in terms of citation impact, while Nature is 4th and 185th, respectively. Nature, however, is more widely cited than IACS. Only 25 journals account for 60% of the citations to JACS, while the same percentage of citations to Nature requires 165 journals. We called this the journal utilization factor back in 1963 when we studied the genetics literature.4

As I have commented elsewhere, 5 a journal's reputation can sometimes cloud the judgment of an author in deciding where to submit a finished manuscript. There is a temptation to believe that the paper will somehow be enhanced by its bibliographical environs. I know from experience as a referee that people do sometimes submit plain junk to prestigious journals. But most scientists are both sensitive and realistic about their work. For the most part, they know when to submit a paper to Science or Nature and when

to avoid the embarrassment and delay of rejection by submitting it in the first place to a lesser journal.

I'm sure prestigious journals occasionally err in rejecting papers their editors may not, for one reason or another, recognize as potentially significant. As a result, an important paper will occasionally appear in a less prestigious journal. Perhaps it's unavoidable—the competition for "prime" publication space grows as the number of scientists grows.

I wish that time and resources had allowed me to analyze the age and institutional affiliation of the authors of these 25 highly cited papers. Such analysis is the subject of serious research at ISI® and elsewhere. I suspect we could verify the repeated assertion that it is younger men who make most of the breakthroughs—a message that cannot be repeated often enough these days to people like Casper Weinberger.

The list of 1971 papers below shows the number of times each has been cited in 1971, 1972 and in the first six-months of 1973. Though the last number isn't included in the total citations by which the papers are ranked, it shows, in most instances, that the citation rate of the listed papers is increasing.

You may be frustrated by our fail-

ure to supply authors' addresses along with the bibliographical information. I would remind you that all the addresses are available in ISI's WIPIS,6 but if you will send me a self-addressed envelope, I'll have them looked up for you. You are right if you conclude that this offer is a ploy to find out whether anyone out there is listening!

- 1. Garfield, E. Were the 1972 papers most cited in 1972 the most significant? Current Contents No. 42, 17 October 73, p. 5-7.
- Goffman, W. A mathematical method for analyzing the growth of a scientific discipline. J. Assoc. Computing Machinery 18(2):173-85, April 1971.
- Garfield, E. Citation analysis as a tool in journal evaluation. Science 178:471-79, 1972. This study was based on 1969 data.
- 4. Garfield, E. & Sher, I.H. New factors in the evaluation of scientific literature through citation indexing.

 American Documentation 14(3): 195-201, 1963.
- 5. Garfield, E. Citation impact depends upon the paper, not the journal! Don't count on citation by association. Current Contents No. 22, 30 May 73, p. 5-6.

The 25 1971	Articles	Most-Cited	in	1971	and	1972.
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					Alticles Most-Cited in 17/1 and 17/2.
	7	Çita	tions	Ē	
Rank	Total 71 & 72	116	972	JanJune 1973 *	Bibliographic Data
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1.	184	66	118	(34)	Sanders, J.K.M. & Williams, D.H. Tris (dipivalomethanato) europium; a paramagnetic shift reagent for use in nuclear magnetic resonance spectroscopy. Journal of the American Chemi-
2.	155	28	127	(89)	cal Society 93(3):641-5, 10 February 1971. Wessells, N.K., Spooner, B.S., Ash, J.F., Bradley, M.O., Luduena, M.A., Taylor, E.L., Wrenn, J.T. & Yamada, K.M. Microfilaments in cellular and developmental processes. Science 171 (3967):135-43, 15 January 1971.
3.	121	36	85	(52)	Rabellino, E., Colon, S., Grey, H.M. & Unanue, E.R. Immuno- globulins on the surface of lymphocytes. I. Distribution and quantitation. J. Exp. Med. 133(1):156-67, 1 January 1971.
4.	115	19	96	(70)	Vane, J.R. Inhibition of prostaglandin synthesis as a mechanism of action for aspirin-like drugs. Nature New Biology
5.	109	27	82	(56)	231(25):232-5, 23 June 1971. Arrighi, F.E. & Hsu, T.C. Localization of heterochromatin in human chromosomes. Cytogenetics 10(2):81-6, 1971.
6.	103	27	76	(23)	DeTar, C.E., Jones, C.E., Low, F.E., Weis, J.H., Young, J.E. & Tan, C.I. Helicity poles, triple-Regge behavior, and single-particle spectra in high-energy collisions. <i>Physical Review Letters</i> 26(11):675-6, 15 March 1971.
7.	95	13	82	(91)	Sumner, A.T., Evans, H.J. & Buckland, R.A. New technique for distinguishing between human chromosomes. <i>Nature New Biology</i> 232(27):31-2, 7 July 1971.
8.	87	25	62	(52)	Dickerson, R.E., Takano, T., Eisenberg, D., Kallai, O.B., Samson, L., Cooper, A. & Margoliash, E. Ferricytochrome c. I. General features of the horse and bonito proteins at 2.8 A
9.	86	20	66	(57)	resolution. J. Biol. Chem. 246(5):1511-35, 10 March 1971. Caspersson, T., Lomakka, G. & Zech, L. The 24 fluorescence patterns of the human metaphase chromosomes; distinguishing the second market of the characters and market like. Here 17(1):2011032-3071.
10.	85	19	66	(45)	ing characters and variability. Hereditas 67(1):89-102, 1971. Rondeau, R.E. & Sievers, R.E. New superior paramagnetic shift reagents for nuclear magnetic resonance spectral
11.	84	0	84	(54)	clarification. J. Am. Chem. Soc. 93(6):1522-4, 24 March 1971. Lee, S.Y., Mendecki, J. & Brawerman, G. A polynucleotide segment rich in adenylic acid in the rapidly-labeled poly- ribosomal RNA component of mouse sarcoma 180 ascites cells. Proc. Nat. Acad. Sci. USA 68(6):1331-5, June 1971.
12.	81	21	60	(50)	Johnson, G.S., Friedman, R.M. & Pastan, I. Restoration of several morphological characteristics of normal fibroblasts in sarcoma cells treated with adenosine-3':5'-cyclic monophosphate and its derivatives. <i>Proc. Nat. Acad. Sci. USA</i> 68(2):425-9, February 1971.
13.	79	0	79	(54)	Edmonds, M., Vaughan, M.H., Jr. & Nakazato, H. Polyadenylic acid sequences in the heterogeneous nuclear RNA and rapidly-labeled polyribosomal RNA of HeLa cells; possible evidence for a precursor relationship. <i>Proc. Nat. Acad. Sci. USA</i> 68(6):1336-40, June 1971.
14.	75	0	75	(72)	Fairbanks, G., Steck, T.L. & Wallach, D.F.H. Electrophoretic analysis of the major polypeptides of the human erythrocyte membrane. <i>Biochemistry</i> 10(13):2606-17, 22 June 1971.
15.	74	15	59	(40)	Matsuo, H., Baba, Y., Nair, R.M.G., Arimura, A. & Schally, A.V. Structure of the porcine LH- and FSH-releasing hormone. I. The proposed amino acid sequence. Biochem. Biophys. Res. Comm. 43(6):1334-9, 18 June 1971.

^{*}These 1973 citation counts have not been included in the totals given in the second column of this table.

	8	Citations		ě	Therees Most Cited in 1771 and 1772.
Rank	Total 71 & 7	1971	1972	JanJu 1973 *	Bibliographic Data
16.	73	0	73	(52)	Darnell, J.E., Wall, R & Tushinski, R.J. An adenylic acidrich sequence in messenger RNA of HeLa cells and its possible relationship to reiterated sites in DNA. <i>Proc. Nat. Acad. Sci. USA</i> 68(6):1321-5, June 1971.
17.	73	22	51	(49)	Hellstrom, I., Hellstrom, K.E., Sjogren H.O. & Warner, G.A. Demonstration of cell-mediated immunity to human neoplasms of various histological types. <i>Internat. J. Cancer</i> 7(1):1-16, 15 January 1971.
18.	73	13	60	(39)	Hubbell, W.L. & McConnell, H.M. Molecular motion in spin- labeled phospholipids and membranes. J. Am. Chem. Soc. 93(2):314-26, 27 January 1971.
19.	72	18	54	(23)	Miledi, R., Molinoff, P. & Potter, L.T. Isolation of the cholinergic receptor protein of <i>Torpedo</i> electric tissue. <i>Nature</i> 229(5286):554-7, 19 February 1971.
20.	72	17	55	(36)	Smith, J.B. & Willis, A.L. Aspirin selectively inhibits prostaglandin production in human platelets. <i>Nature New Biology</i> 231(25):235-7, 23 June 1971.
21.	68	19	49	(16)	Abarbanel, H.D.I., Chew, G.F., Goldberger, M.L. & Saunders, L.M. Small dimensionless parameter to characterize multiple-Pomeranchon phenomena. <i>Physical Review Letters</i> 26(15):937-40, 12 April 1971.
22.	67	17	50	(37)	Ferreira, S.H., Moncada, S. & Vane, J.R. Indomethacin and aspirin abolish prostaglandin release from the spleen. Nature New Biology 231(25):237-9, 23 June 1971.
22	67	20	47	/171	Moore DH Charney I Kramersky B Lectorques EV

The 25 1971 Articles Most-Cited in 1971 and 1972.

23.

24.

67

66

20 47

13 53

(17)

(35)

Moore, D.H., Charney, J., Kramarsky, B., Lasfargues, E.Y., Sarkar, N.H., Brennan, M.J., Burrows, J.H., Sirsat, S.M.,

Paymaster, J.C. & Vaidya, A.B. Search for a human breast cancer virus. Nature 229(5287):611-5, 26 February 1971. Brandt, R.A. & Preparata, G. Operator product expansions

near the light cone. Nuclear Physics B B27(3):541-67,

^{25. 64 16 48 (16)} Harari, H. Dual absorptive model for dips in inelastic hadron processes. Physical Review Letters 26(22):1400-4, 31 May 1971.

^{*}These 1973 citation counts have not been included in the totals given in the second column of this table.