

Current Comments®

EUGENE GARFIELD

INSTITUTE FOR SCIENTIFIC INFORMATION®
3501 MARKET ST., PHILADELPHIA, PA 19104

Citation Classics in Clinical Chemistry Highlight the Cumulative Impact of Useful Methods—A Tribute to Editor John Stanton King

Number 37

September 16, 1991

In 1990, after 20 years with the journal *Clinical Chemistry*, J. Stanton King stepped down as executive editor to enjoy a well-earned retirement. His retirement may now change just a bit, though, as he has recently been appointed editor emeritus.

Much of what King says in the following valedictory brought out memories and feelings of my own editing career. And, I am sure it will evoke similar emotions for anyone who has had the pleasure (except when deadlines approach) of editing a journal. The greatest rewards are deep-felt and personal, and the recognition from peers and readers surpasses any formal award.

Reprinting this essay also gives me the opportunity to review the impact of this journal and its most-cited papers, as determined from the *Science Citation Index*® (SCI®), 1945-1990. The last time I discussed *Clinical Chemistry* in *Current Contents*® (CC®) was in 1974,¹ when King was still new to the job. Since then, both publications have come a long way.

King's Career

After military service during World War II, King completed his undergraduate work in chemistry at Berea College and the University of Chicago. This was followed by employment with the S.E. Massengill Company, with time off to earn his PhD in biochemistry from the University of Tennessee. Following his work at Massengill, King joined the ranks of academia, teaching at the Bowman Gray School of Medicine, Wake Forest University, Winston-Salem, North Carolina. Then, after 14 years of teach-



J. Stanton King

ing, King moved to his ultimate position as executive editor of *Clinical Chemistry*.

During his career, King contributed to more than 100 publications and received such honors as the American Association for Clinical Chemistry (AACC) Award for Outstanding Contributions to Clinical Chemistry in a Special Area, the Miriam Reiner Award (Capital Section, AACC), the Bernard Gerulat Award (New Jersey Section, AACC), and the Career Development Award (National Institutes of Health). His farewell commentary is a wonderfully poignant statement of the professional life and viewpoint of an editor.

Citation Classics in Clinical Chemistry

The 15 most-cited papers from this journal are listed in Table 1. All qualify as *Citation Classics*®. Seven were published while

Table 1: The most-cited papers from *Clinical Chemistry*, according to the *SCI*®, 1945-1988. Papers are arranged in alphabetical order. A=1945-1988 citations. B=1989 citations. C=1990 citations. D=1945-1990 citations.

A	B	C	D	Bibliographic Data
1,496	218	195	1,909	Allain C C, Poon L S, Chan C S G, Richmond W & Fu P C. Enzymatic determination of total serum cholesterol. <i>Clin. Chem.</i> 20:470-5, 1974.
691	83	99	873	Bucolo G & David H. Quantitative determination of serum triglycerides by the use of enzymes. <i>Clin. Chem.</i> 19:476-82, 1973.
1,123	58	52	1,233	Chaney A L & Marbach E P. Modified reagents for determination of urea and ammonia. <i>Clin. Chem.</i> 8:130-2, 1962.
469	16	15	500	Dubowski K M. An o-toluidine method for body-fluid glucose determination. <i>Clin. Chem.</i> 8:215-35, 1962.
852	190	227	1,269	Friedewald W T, Levy R I & Fredrickson D S. Estimation of the concentration of low-density lipoprotein cholesterol in plasma, without use of the preparative ultracentrifuge. <i>Clin. Chem.</i> 18:499-502, 1972.
458	28	37	523	Kadish A H, Little R L & Sternberg J C. A new and rapid method for the determination of glucose by measurement of rate of oxygen consumption. <i>Clin. Chem.</i> 14:116-31, 1968.
370	23	33	426	Khym J X. An analytical system for rapid separation of tissue nucleotides at low pressures on conventional anion exchangers. <i>Clin. Chem.</i> 21:1245-52, 1975.
430	48	36	514	Lopes-Virella M F, Stone P, Ellis S & Colwell J A. Cholesterol determination in high-density lipoproteins separated by three different methods. <i>Clin. Chem.</i> 23:882-4, 1977.
409	19	12	440	Marbach E P & Weil M H. Rapid enzymatic measurement of blood lactate and pyruvate; use and significance of metaphosphoric acid as a common precipitant. <i>Clin. Chem.</i> 13:314-25, 1967.
658	23	28	709	Marsh W H, Fingerhut B & Miller H. Automated and manual direct methods for the determination of blood urea. <i>Clin. Chem.</i> 11:624-7, 1965.
487	15	14	516	Nagatsu T & Udenfriend S. Photometric assay of dopamine- β -hydroxylase activity in human blood. <i>Clin. Chem.</i> 18:980-3, 1972.
685	32	44	761	Rodbard D. Statistical quality control and routine data processing for radioimmunoassays and immunoradiometric assays. <i>Clin. Chem.</i> 20:1255-70, 1974.
880	5	4	889	Silber R H, Busch R D & Oslapas R. Practical procedure for estimation of corticosterone or hydrocortisone. <i>Clin. Chem.</i> 4:278-85, 1958.
655	30	32	717	Szasz G. A kinetic photometric method for serum γ -glutamyl transpeptidase. <i>Clin. Chem.</i> 15:124-36, 1969.
390	4	1	395	Washko M E & Rice E W. Determination of glucose by an improved enzymatic procedure. <i>Clin. Chem.</i> 7:542-5, 1961.

King was editor. The most-cited paper, "Enzymatic determination of total serum cholesterol," by C.C. Allain et al., was cited more than 2,000 times through the end of June 1991, making it one of the 500 most-cited papers ever published.

The journal itself, founded in 1955, continues as a strong vehicle for important papers. In our 1974 essay, *Clinical Chemistry*, in 1969, was ranked 367th in terms of citations (1,612) and 638th in terms of its impact factor (0.683). The impact factor, however, was skewed by the fact that *Clinical Chemistry* publishes a large number of items which, by their nature (abstracts, etc.) are not highly cited. By recalculating the impact factor for 1972, based on source items that included only "original articles," scientific and technical notes, and reviews, it increased by a factor of four—to 2.7. By

the end of 1989, it ranked 108th in annual citations (12,003) and 672d in impact factor (1.65), based on the calculation method used in 1972. The journal's long-term influence is reflected in the increase in its annual citations. Of course, the papers listed in Table 1 account for a part of that influence. Realize, however, that the journal has been cited more than 140,000 times in the past 20 years.

Other Journals in Clinical Chemistry

Also covered in the 1974 essay was the journal *Clinica Chimica Acta*, founded in 1956 and published by Elsevier Biomedical Press. In 1989, it received 7,486 citations. Its impact was 1.27. The field of clinical chemistry is relatively small, so the two journals account for many of the widely

Table 2: The most-cited papers from *Clinica Chimica Acta* according to the SCI®, 1945-1990. Papers are arranged in alphabetical order. A=1945-1990 citations. B=1990 citations.

A	B	Bibliographic Data
492	12	Baum H, Dodgson K S & Spencer B. The assay of arylsulphatases A and B in human urine. <i>Clin. Chim. Acta</i> 4:453-5, 1959.
477	11	Burstein M & Szamelle J. Sur un dosage rapide du cholestérol lié aux α - et aux β -lipoprotéines du sérum (On a rapid determination of cholesterol bound to α - and β -lipoproteins in serum). <i>Clin. Chim. Acta</i> 5:609, 1960.
462	34	Ceska M, Birath K & Brown B. A new and rapid method for the clinical determination of α -amylase in human serum and urine. Optimal conditions. <i>Clin. Chim. Acta</i> 26:437-44, 1969.
812	43	Doumas B T, Watson W A & Biggs H G. Albumin standards and the measurement of serum albumin with bromocresol green. <i>Clin. Chim. Acta</i> 31:87-96, 1971.
1,068	20	Duncombe W G. The colorimetric micro-determination of non-esterified fatty acids in plasma. <i>Clin. Chim. Acta</i> 9:122-5, 1964.
704	19	Fletcher M J. A colorimetric method for estimating serum triglycerides. <i>Clin. Chim. Acta</i> 22:393-7, 1968.
585	11	Hyvärinen A & Nikkila E A. Specific determination of blood glucose with <i>o</i> -toluidine. <i>Clin. Chim. Acta</i> 7:140-3, 1962.
458	7	Itaya K & Ui M. A new micromethod for the colorimetric determination of inorganic phosphate. <i>Clin. Chim. Acta</i> 14:361-6, 1966.
504	11	Laurell S & Tibbling G. Colorimetric micro-determination of free fatty acids in plasma. <i>Clin. Chim. Acta</i> 16:57-62, 1967.
511	3	Marks V. An improved glucose-oxidase method for determining blood, C.S.F. and urine glucose levels. <i>Clin. Chim. Acta</i> 4:395-400, 1959.
645	3	Pisano J J, Crout J R & Abraham D. Determination of 3-methoxy-4-hydroxymandelic acid in urine. <i>Clin. Chim. Acta</i> 7:285-91, 1962.
402	7	Ramsay W N M. The determination of the total iron-binding capacity of serum. <i>Clin. Chim. Acta</i> 2:221-6, 1957.
429	8	Searcy R L & Bergquist L M. A new color reaction for the quantitation of serum cholesterol. <i>Clin. Chim. Acta</i> 5:192-9, 1960.
544	33	Stegemann H & Stalder K. Determination of hydroxyproline. <i>Clin. Chim. Acta</i> 18:267-73, 1967.
551	37	Tovey K C, Oldham K G & Whelan J A M. A simple direct assay for cyclic AMP in plasma and other biological samples using an improved competitive protein binding technique. <i>Clin. Chim. Acta</i> 56:221-34, 1974.
615	33	van Kampen E J & Zijlstra W G. Standardization of hemoglobinometry. II. The hemoglobincyanide method. <i>Clin. Chim. Acta</i> 6:538-44, 1961.
407	5	Watson D. A simple method for the determination of serum cholesterol. <i>Clin. Chim. Acta</i> 5:637-43, 1960.
399	3	Wieme R J. An improved technique of agar-gel electrophoresis on microscope slides. <i>Clin. Chim. Acta</i> 4:317-21, 1959.

cited methods. *Clinica Chimica Acta* has published 18 papers that received 400 or more citations in its 34-year history. They are listed in Table 2. The most-cited paper in this journal was written by W.G. Duncombe, dealing with the measurement of nonesterified fatty acids in plasma.

As the definition of chemistry expands to the broader "chemical sciences and technologies," other journals begin to have an impact on the field. One journal linked to clinical chemistry, on the basis of citations to the two journals mentioned above, is *Clinical Biochemistry*, started in 1967. It is published by the Canadian Society of Clinical Chemists. Its impact factor and annual citations in 1989 were 1.01 and 664, respectively.

A new journal in the field is the quarterly *Clinical Biotechnology*, begun in 1989 and now published by Mary Ann Liebert, Inc. This journal will be covered in a new *Biotechnology Citation Index*, to be launched by ISI®. Table 3 is a listing of clinical chemistry journals.

The New Editor

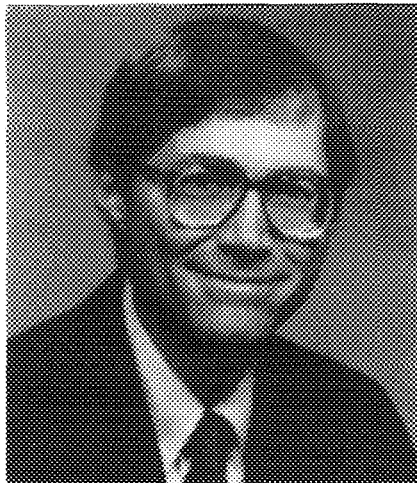
The duties of the editor of *Clinical Chemistry* are now in the very capable hands of David E. Bruns. After receiving undergraduate degrees in chemical engineering from Washington University, St. Louis, and working as a research chemist for Sigma Chemical Company, Bruns earned his medical degree from St. Louis University. He

Table 3: Clinical chemistry journals. A=journal title. B=inception date. C=impact factor from 1989 *JCR* *. D=times cited in 1989. E=number of source items published in 1989.

A	B	C	D	E
Advances in Clinical Chemistry	1958	1.20	201	7
Annals of Clinical Biochemistry	1964	1.10	1,802	106
Clinical Biochemistry	1967	1.01	664	69
Clinical Biotechnology	1989	*	*	*
Clinical Chemistry	1955	1.65	12,003	528
Clinica Chimica Acta	1956	1.27	7,486	267
European Journal of Clinical Chemistry and Clinical Biochemistry**	1963	1.14	2,308	111
Journal of Clinical Biochemistry and Nutrition	1986	.28	641	31

* Not covered in the *JCR* in 1989

** Originally *Z. Klin. Chem. Klin. Biochem.* (1963); changed to *J. Clin. Chem. Clin. Biochem.* (1976); changed to *Eur. J. Clin. Chem. Clin. Biochem.* (1991).



David E. Bruns

followed this with a residency at Barnes Hospital and Washington University School of Medicine in laboratory medicine, experimental pathology, and clinical chemistry. He is now a professor of pathology at the University of Virginia School of Medicine, where he has worked since 1977.

Bruns serves on the Executive Council of the Academy of Clinical Laboratory Physicians and Scientists. His current areas of research include mechanisms and control of intestinal and placental calcium transport, PTH-related protein in the uteroplacental tissue, and applications of new diagnostic techniques in clinical pathology.

In 1987, Bruns received both the Award for Outstanding Contributions to Research (American Association for Clinical Research) and the Sunderman Award as Clinical Scientist of the Year (Association of Clinical Scientists, of which he was president in 1985 and 1986).

Methods Papers

There is a widespread myth that only methods papers become citation superstars. That myth is perpetuated because of a small number of anomalous papers like the Lowry method.² It is easy to overlook the fact that all journals, but especially methods journals, also publish large numbers of other papers that do not achieve such distinction.

Another perspective provided by this study of two relatively small journals is that the long-range impact of their best articles may not be noticed for many years. Once the methods involved have become more routinely used, their classic status becomes "self-evident."

My thanks to Mark Fitzgerald for his help in the preparation of this introduction.

©ASIS 1991

REFERENCES

1. **Garfield E.** Journal citation studies. XVI. *Clinical Chemistry and Clinica Chimica Acta. Current Contents* (48):5-9, 27 November 1974. (Reprinted in: *Essays of an information scientist*. Philadelphia: ISI Press, 1977. Vol. 2. p. 179-83.)
2. **Lowry O H.** Citation Classic. Commentary on *J. Biol. Chem.* 193:265, 1951. (Barrett J T, ed.) *Contemporary classics in the life sciences. Volume 2: the molecules of life*. Philadelphia: ISI Press, 1986. p. 87.

Remonstrance, Apostrophe, and Valedictory

By J.S. King

Now comes the time when I must bid you adieu, leaving you in the hands of Cosmas and Damion (the patron saints of medicine) and of my successor, who has my best wishes. He will find that the laws of Parkinson, Murphy, et al. apply with a vengeance, especially these:

- nothing is as easy as it looks;
- everything takes longer than you think it will;
- if anything can go wrong, it will;
- nothing is impossible for the man who doesn't have to do it himself; and, of course,
- the last person who quit or was fired will be held responsible for everything that goes wrong—until the next person quits or is fired.

On the other hand, my successor will find the work easy and challenging in some ways. Because his handiwork is invisible, he can, like most professionals, work only as hard as his conscience dictates. There will be intervals of sheer tedium, such as seeing an evaluation of the *n*th procedure for serum glucose. He must resign himself to these as he would resign himself on looking up from the operating table and finding that his surgeon is parkinsonian. Everything is done indoors, and no heavy lifting is involved. He will have an opportunity not to add to the world's extraordinary profusion of injustice. His objectivity must be beyond question.

Intellectually, an editor can be the lowest common denominator in a sense: if he cannot understand what an author is trying to say, then a good many other readers probably also cannot, so something needs fixing. He should continually try to think of ways to make this journal more interesting and more useful, but he must be as convincing as a seductress and must make his bosses believe that any change he suggests is really *their* idea if he is to have any realistic chance of it being effected.

He should remember, but never say out loud, that he is working for you, the readers, and not, in the final analysis, only to please contributors or the various panjandrums who hold sway over him, most of whom are convinced that the job is a simple one and are confident that they could do better than he.

If he (and the reviewers) do their job properly—i.e., do not merely dispense soothing unction—he (and they) occasionally will evoke the wrath of an author. This is not surprising for one who, in effect, makes his living by criticizing other people's babies. The wrath usually vanishes once the paper is printed—the smiling baby now appearing in ribbons and bows, with all (or most) surface defects missing.

He should be prejudiced in favor of excellence, which usually simply means taking extra pains.

He will deal with some incredibly careless authors who never trouble to learn and will be content to allow him to spend more time editing their papers than they did writing them. Such contributors, like a recalcitrant mule, will need hitting with a figurative plank to get their attention. (It isn't called a "discipline" for nothing.)

He will be certain of a spiritual life at least once a month when—*mirabile dictu*—the journal appears, an achievement buttressed by a monthly backup stack of paper as high as himself.

So much for sage admonition and alarums. Such platitudes hardly need illumination, and I apologize for rehearsing them.

Of the sundry employers I have had over the years, none has, on the whole, been as kind, supportive, and pleasant to work for as have the officers and members of this Association. Not the least of the fringe benefits has been the freedom (license?) to put in this space, every month, anything that fancy dictates, especially my prejudices with respect to government stupidity, bureaucratic interference in our lives, throwaway journals, careless authors, and megalomaniacs.

(Mark Twain said: "It may be thought that I am prejudiced. Perhaps I am. I would be ashamed of myself if I were not.")

Honors and kind words were bestowed on me last July at the national meeting (and, during these last months, by many contributors). I am grateful. I especially thank Drs. Carl Burtis and Jack Ladenson for their role in a particular surprise: a scholarship in my name granted by the Association to Berea College, that unique Kentucky work/study school where, in Depression days, one of my jobs was in the College Press.¹ There I acquired, along with the prewar part of my education, an unusual appreciation for the mechanics of how the printed word is produced (what changes since then!) and how it can be made more aesthetically pleasing.

Being Executive Editor of this journal (and, for a time, AACC's Executive Director) has been the world's best job. But now, after 243 months, the sacred fires have cooled a little. Someone is needed who is closer to the laboratory bench. And I sense

that the days of the conventional printed scientific journal (costwise a relatively inefficient way of communicating information)² may be numbered.

I have been unusually blessed with skilled and dedicated colleagues in this editorial office, for most of the years two and never more than three,³ to whom I cannot give enough credit for their diligence and cheerful tolerance of sometimes unreasonable demands.⁴

I must also thank the thousands of reviewers, who have kept us on the right path.

When I compare volume 16, no. 1, with current issues, I can only be proud—of us and of you. May your profession continue this astonishing evolution! You are benefactors to the world, continually making your part of health care more cost-efficient, reliable, and effective. It has been a long time now since the physician could validly choose to believe only those results that fit his or her preconceptions, if those results emanate from a good laboratory.

¹During 1920-1980, 134-year-old Berea, which is committed to and draws most of its 1500 students from the farms and coal fields of Southern Appalachia, reportedly ranked second in the South (33rd in the nation) in the proportion of graduates who went on to earn doctorates. It was rated by *U.S. News and World Report* the number one U.S. college in its category for the third consecutive time in 1988. (In 1988 and 1989, Wake Forest University, here in Winston-Salem, ranked no. 1 in its category.) In 1989, it ranked third in a more-comprehensive category. With no tuition, it costs the average freshman the least [thanks to endowments, gifts (nearly \$12 million last year), scholarships, and the work program] of any U.S. college, except for the military/naval/air force academies, for which of course you, the taxpayers, foot the bills.

²Studies show that a small proportion of any journal's contents is read and used by any given reader. See also "Has the medical journal a future?" (Lock S, *Trans Med Soc Lond* 1987:52).

³A prominent medical journal with a similar number of text pages, far less well edited than this one in terms of observing international recommendations, lists a staff of 35 on its masthead. But then there are more of them (i.e., physicians) than us, and they're a good deal richer.

⁴An example: the thankless task of typing in camera-ready form the entire text of one of the 35 or so AACC books that have been prepared for press in this office. Another: the agonies of "computerizing" this office, which, once accomplished, has proved gratifying. It is a satisfaction to leave such a congenial and smoothly functioning office.

Reprinted, with permission, from *Clinical Chemistry* 36(2):413-4, 1990. Copyright to the American Association for Clinical Chemistry, Inc.

CORRECTION

In the essay announcing *Current Contents on Diskette*® with Abstracts (*Current Contents* (19):5-9, 13 May 1991), the last paragraph on page 8 contained an incorrect toll free number to call for information about the product. The correct number is: 1-800-336-4474, operator 257. We regret any inconvenience this may have caused.