Current Comments®

What's in a Name? The Eponymic Route to Immortality

Number 47 November 21, 1983

In our day-to-day lives, we frequently encounter places and things named after people. Streets, airports, and towns are often named after individuals. So are commonly used machines, such as the *diesel engine*, and clothing, such as the *mackintosh raincoat*. This form of naming honors a person who makes some contribution to our culture. The term for a person so honored is "eponym." Thus, Rudolf Diesel is the eponym of the diesel engine.

The term eponym is derived from the Greek words *epi*, meaning upon, and *onyma*, meaning name.[1] In addition to designating the namesake of a word, eponym has a second meaning—a term or phrase *derived from* a person's name.[2] By this definition, diesel engine is also an eponym. The second usage seems to be gaining ascendancy[3] and clearly predominates in the literature consulted for this essay. It is this meaning for this homonymous word that is used here.

In the sciences, eponymy is a hallowed tradition. It often honors the discoverer of a law or theorem, as in *Newton's law of gravitation*; the describer of a new disease, as in *Addison's pernicious anemia*; or the inventor of new equipment, as in the *Bunsen burner*. Scientists are far more frequently eponymized than humanities scholars. According to Cyril L. Beeching, compiler of *A Dictionary of Eponyms*,[4] painters and musicians are least often eponymized.

Nevertheless, some eponyms are found in almost every field of scholarship, as well as in many areas of popular culture. Even in music we have the *saxophone*, named for Adolphe Sax, the Belgian instrument maker, and the *sousaphone*, named for John Philip Sousa, the American bandmaster. And, oddly enough, Beethoven appears to have inspired an engineering eponym, the *Beethoven exploder*, a machine used for firing multiple detonators of explosives in tunneling and quarrying.[5] Yet one would be hard put to determine exactly how many eponyms each field can claim. Webster's unabridged dictionary lists about 9,000 eponyms in all fields. The *Eponyms Dictionaries Index* (*EDI*), edited by James A. Ruffner, Wayne State University Science Library, Detroit, Michigan, lists 20,000 eponyms overall, as well as 13,000 eponymized persons.[3]

The number of eponyms in the *EDI* is so large because it includes many that are no longer capitalized. When an eponym is no longer capitalized, it's a sign that the term has been fully absorbed into everyday language. This is the ultimate tribute to the person eponymized. But by the time it occurs, the link between word and person is usually lost. For example, how many dancers today realize that the inventor of their costume was Jules Léotard, a nineteenth-century trapeze artist? He said of the *leotard*, "Do you want to be adored by the ladies?... Put on a more natural garb, which does not hide your best features."[6] (p. 168) Popular eponyms are like popular trademarks in this respect.

When completely absorbed into the language, immortals soon become, as Jimmy Durante would say, "mortalized."

Léotard, like most people who are eponymized, is associated with only one eponym. But five or ten eponyms may be created in the wake of an eminent scientist. The record is held by a nineteenth-century French chemist named Georges Deniges,[3] of whom I had never heard until now. Although clearly not a household word, at least in the US, Deniges inspired 78 eponyms, primarily tests and reagents, such as *Deniges's test for selenium* and *Deniges's benzoyl reagent*. Better known scientists such as Albert Einstein and Isaac Newton have been identified with only about 40 eponyms each.

Many of the eponyms used today have been introduced since the rise of modern science in the sixteenth and seventeenth centuries. But eponymy is an ancient practice. Some of the earliest recorded eponyms date from the first and second millennia BC, when the Assyrians named each calendar year after a high official.[7] Historians have relied heavily on lists of these named years (eponym lists) to reconstruct Assyrian history. For example, kings usually gave their names to the first year of their reign. So it was possible to estimate the length of a reign intervening between two successive kings' names by counting the number of names on the eponym list. The number of names usually equals the number of years in the reign of the first king. Thus, the long reign of Sennacherib, the Assyrian empire-builder mentioned in the Old Testament for his siege of Jerusalem, was fixed between 704 and 681 BC.[8]

Similarly, in ancient Athens, the name of the archon, an official who held office for one year, was used to designate each calendar year.[9] The year 594 BC was named after Solon, the great lawgiver. The Greeks also named places after their heroes.[1] Thus, the Peloponnesus region takes its name from the mythological figure Pelops, a grandson of Zeus.

Greek mythology has provided some modern eponyms as well. In medicine, the *Ulysses syndrome*[10] describes the phenomenon of a doctor subjecting a healthy patient to a battery of unnecessary diagnostic tests, because of initial test results outside the "normal" range. Like Ulysses, the patient ends up somewhat worse for wear, after much fruitless exploration. The *Hermes syndrome*,[11] coined in response to medical journal editorials on theft from medical libraries, takes its name from the god of thieves.

Literature, too, supplies us with scientific eponyms. The *Pickwickian syndrome*,[12] a type of breathing difficulty associated with obesity, is named after the portly character called "the fat boy" in Charles Dickens's *Pickwick Papers*. The *Jekyll-and-Hyde syndrome*,[13] which describes dramatic changes in the behavior of elderly patients, is named after the leading character in Robert Louis Stevenson's famous story.

Although, strictly speaking, eponymy refers to terms named after persons, geographic eponyms also occur in scientific nomenclature. The *Framingham study*, a long-term investigation of the epidemiology of atherosclerotic disease, takes its name from the study site, Framingham, Massachusetts.[14] Similarly, *Lyme disease*, a form of arthritis caused by tick-borne bacteria, was named for the town of Lyme, Connecticut, where the first cases occurred.[15] Another variation on the theme of eponymy is the corporate eponym. An example is *Legionnaires' disease*. This epidemic form of pneumonia was named for the American Legion members who were among its first known victims.[16] Incidentally, naming a disease for the patient rather than the doctor is unusual but not unheard of. *Hartnup's disease*,[17] a hereditary metabolic disorder, and *Mortimer's disease*,[18] a skin condition, are among the few so named.

The vast majority of scientific eponyms, however, are named after individual scientists. Perhaps the most eponymized scientists are horticulturists and

botanists, whose names are routinely invoked in naming plants, particularly those they have identified. The genera *Darlingtonia*, *Downingia*, *Graysia*, and *Halesia* all commemorate renowned botanists. Beeching asserts that eponymic species of roses alone "would fill a volume."[4] (p. 8) Furthermore, almost every common house and garden plant has an eponymic name. Thus we have the *dahlia*, the *forsythia*, and the *fuchsia*, which honor the botanists Anders Dahl, William Forsyth, and Leonhard Fuchs, respectively. Eponyms also account for such odd-sounding plant names as *bougainvillea*, *cattleya*, *rafflesia*, and *zoysia*.

In bacteriology the naming of species is also heavily eponymic. In fact, *both* the genus *and* species names of the organism *Rickettsia prowazeki* honor individuals. This organism, which causes epidemic typhus, is named for the pathologist Howard Ricketts and the zoologist Stanislas von Prowazek, whose lives it claimed.[19]

In addition, many names of minerals are derived from proper names. A number of the minerals used by humankind since antiquity have been named for places. Bronze is a corrupted form of Brundisium (now Brindisi) in southern Italy, and copper a corrupted form of Cyprus. But the tendency in the last several centuries has been to name new minerals in honor of scientists. Thus we have *cordierite*, named for its discoverer, the eighteenth-century French geologist Pierre Louis Cordier, and *smithsonite*, named for the English chemist and mineralogist, James Smithson, founder of the Smithsonian Institution, Washington, DC.[20] Cordierite is a silicate of iron, magnesium, and aluminum. Smithsonite is a white zinc carbonate.

Eponyms are also abundant in mathematics and the "hard" sciences of physics and chemistry. There are so many that *A Dictionary of Named Effects and Laws in Chemistry, Physics and Mathematics* has been compiled by Denis W.G. Ballentyne, Imperial College, University of London, England, and D.R. Lovett, University of Essex, Colchester, England.[21] *Clausius's statement*, *Helmholtz's equation*, *Einstein's theory of relativity*, and the *Kelvin temperature scale* all commemorate the work of giants in these fields. Many commonly used chemical methods are eponymic, including the *Hofmann rearrangement*, the *Wittig reaction*, and the *Eschenmoser hydrolysis*. Furthermore, science honors early pioneers in electricity and magnetics in naming such fundamental units as the *volt*, *ohm*, *ampere*, *coulomb*, *farad*, and *oersted*.[22]

Other fields, such as mechanical engineering and economics, have their own lists of eponyms. But medicine has a particularly rich eponymic tradition. I've already mentioned several eponymic syndromes and diseases. The *Illustrated Dictionary of Eponymic Syndromes and Diseases and Their Synonyms*[23] lists about 9,000 more. This was compiled by my old friend Stanley Jablonski, National Library of Medicine, Washington, DC, who is now working on a new edition. A selection of highly cited papers associated with syndromes and diseases included in the dictionary are listed in Table 1.

In addition, many diagnostic tests, instruments, and anatomical parts have eponymic names. Thus we have the *Quick test* (for blood clotting), named for the hematologist Armand Quick; *Doyen's clamp* (an intestinal occlusion clamp), named for the nineteenth-century French surgeon Eugene-Louis Doyen; and *Bowman's capsule* (a structure in the kidney), named for the nineteenth-century English anatomist, William Bowman.

Although medical terminology is replete with eponyms, in no other field is their use so hotly debated. In fact, in 1955, the International Congress of Anatomy at Paris adopted an official list of anatomical terms from which all eponyms had been purged.[24] Many anatomists and other doctors object to eponyms because they aren't descriptive.[25] Another objection is that a disease often outgrows its eponym. For example, *Tay-*

Table 1: *A selected list of eponymic papers cited over 200 times between 1961 and 1983. Papers identified by ISI® as Citation Classics™ are followed by the issue number and year of CC® in which the classic appeared. A = citations from 1961 to 1983. B = bibliographic data, eponym, and definition.*

A	B
309	**Burkitt D.** A sarcoma involving the jaws in African children. *Brit. J. Surg.* 46:218-23, 1958. 21/83/LS **Burkitt's lymphoma**—Lymphoma of the jaw and retroperitoneal area
759	**Earle W R, Schilling E L, Stark T H, Straus N P, Brown M F & Shelton E.** Production of malignancy in vitro. 4. The mouse fibroblast cultures and changes seen in the living cells. *J. Nat. Cancer Inst.* 4:165-212, 1943. 46/78 **Earle L fibrosarcoma**—Transplantable fibrosarcoma produced from mouse tissue
328	**Edwards J H, Harnden D G, Cameron A H, Crosse V M & Wolff O H.** A new trisomic syndrome. *Lancet* 1:787-90, 1960. **Edwards's syndrome**—Multiple severe birth defects caused by an extra chromosome in the 16-18 group
610	**Friend C.** Cell-free transmission in adult Swiss mice of a disease having the character of a leukemia. *J. Exp. Med.* 105:307-18, 1957. **Friend's leukemia**—Transplantable leukemia produced in mice
726	**Goldblatt H, Lynch J, Hanzal R F & Summerville W W.** Studies on experimental hypertension. I. The production of persistent elevation of systolic blood pressure by means of renal ischemia. *J. Exp. Med.* 59:347-79, 1934. **Goldblatt's hypertension**—Systolic hypertension produced by obstruction of renal arteries
295	**Gordon R S.** Exudative enteropathy: abnormal permeability of the gastrointestinal tract demonstrable with labelled polyvinylpyrrolidone. *Lancet* 1:325-6, 1959. 13/81/CP **Gordon's disease**—Group of disorders caused by hypoproteinemia due to leakage and intestinal malabsorption of proteins
315	**Kanner L.** Autistic disturbances of affective contact. *Nerv. Child* 2:217-50, 1943. 25/79/S&BS **Kanner's syndrome**—Childhood autism
362	**Patau K, Smith D W, Therman E, Inhorn S L & Wagner H P.** Multiple congenital anomaly caused by an extra autosome. *Lancet* 1:790-3, 1960. 48/78 **Patau's syndrome**—Multiple severe birth defects caused by extra chromosome in the 13-15 group
278	**Shy G M & Drager G A.** A neurological syndrome associated with orthostatic hypotension. *Arch. Neurol.* 2:511-27, 1960. **Shy-Drager syndrome**—Progressive neurological disorder that causes primary changes in the central nervous system
332	**Sipple J H.** The association of pheochromocytoma with carcinoma of the thyroid gland. *Amer. J. Med.* 31:163-6, 1961. **Sipple's syndrome**—Carcinoma of the thyroid
207	**Stein I F & Leventhal M L.** Amenorrhea associated with bilateral polycystic ovaries. *Amer. J. Obstet. Gynecol.* 29:181-91, 1935. **Stein-Leventhal syndrome**—Syndrome characterized by polycystic ovaries accompanied by amenorrhea, sterility, obesity, and hirsutism
267	**Wermer P.** Genetic aspects of adenomatosis of endocrine glands. *Amer. J. Med.* 16:363-71, 1954. **Wermer's syndrome**—Endocrine gland tumors combined with Zollinger-Ellison syndrome, an association of gastric hypersecretion, hyperacidity, and recurrent peptic ulcer with pancreatic tumors
257	**Zieve L.** Jaundice, hyperlipemia and hemolytic anemia: a heretofore unrecognized syndrome associated with alcoholic fatty liver and cirrhosis. *Ann. Intern. Med.* 48:471-96, 1958. 39/83/CP **Zieve's syndrome**—Jaundice and hemolytic anemia associated with alcoholic fatty liver and mild cirrhosis

Sachs disease, originally a generic term for a syndrome of dementia and blindness in infants, is now applied to only one variant among a family of diseases caused by different biochemical deficiencies.[26] Incidentally, the first paper identifying such a biochemical deficiency, by Shintaro Okada, Osaka University, Japan, and John S. O'Brien, University of California, La Jolla, has become a *Citation Classic* ™.[27] (A *Citation Classic* is one of the highly cited papers featured each week in *Current Contents*®.)

Critics of eponymy also argue that eponyms often memorialize the wrong people. *Möller-Barlow disease*, a form

of scurvy occurring in infants, was described by Francis Glisson about 200 years before J.O.L. Möller of Germany and Thomas Barlow of England published their descriptions of it in 1862[28] and 1883,[29] respectively.[30] And Saint never wrote a paper describing *Saint's triad*, a combination of hiatal hernia, diverticulosis, and gallstones.[31] In addition, although their work wasn't wrongly attributed, some of the most important figures in the history of medicine, such as William Harvey, describer of the circulatory system, have not been eponymized.[32]

But some view these very same weaknesses of eponyms as their strengths. It's true that eponyms don't describe the thing they name. Descriptive terms, however, can be misleading. H.E.M. Kay, Royal Marsden Hospital, London, England, gives the example of "acute lymphoblastic leukemia."[33] Although this descriptive name seemed appropriate at first, it is now known that this condition doesn't always involve the high white blood cell count that "leukemia" implies. Also, no connection with lymphoblasts has been proved.

In another example, Roy D. Schmickel, University of Pennsylvania, Philadelphia, notes that the role of chromosomes wasn't understood when many syndromes were first recognized.[34] So the modern descriptive terms "trisomy 21" and "monosomy X" couldn't have been coined for the chromosomal disorders known as *Down's syndrome* and *Turner's syndrome*. However, the descriptive term "mongolism," for Down's syndrome, gained wide usage even though it is inaccurate at best and racist at worst. Turner's syndrome, in contrast, was always known by the eponym, which, as Schmickel points out,[34] has served the medical community far better.

Schmickel praises the eponym as "a neutral term that allows a concept to evolve, free of any preconceived notions."[34] (p. 486) It doesn't bias research in any particular direction. If a syndrome outgrows an eponym by turning out to be several different conditions, then the eponym can be retired. But up to that point, it has served its purpose. Like other facets of natural language, the eponym serves as a useful symbol until enough is known about the disease that an accurate descriptive term can be coined. Even then, eponyms may be preferable to descriptive terms because they are usually shorter. Why say *osteodystrophia chronica deformans hypertrophica*, when you can say *Paget's disease*? (Paget's disease is a deforming bone inflammation that strikes patients over age 40.)

Although eponyms are often misattributed, some think it better to credit the person who clearly established the significance of a discovery, rather than the original discoverer.[31] Without a champion, the discovery might have languished in obscurity, in which case the original discoverer would have remained unacknowledged anyway. Of course, a double eponym naming both provides a simple compromise.

While it's true that some great scientists, such as Harvey, are not explicitly named in formal eponyms, their place in history has hardly suffered. By contrast, probably few today remember Deniges, even with his 78 eponyms. Nevertheless, eponyms assure at least a limited, temporary measure of credit to many scientists who might otherwise be completely forgotten.

Another advantage of eponyms is that they enliven medical history. Behind each eponym is a story for a student or practitioner to seek out. Mason G. Robertson, a physician in Savannah, Georgia, has called the eponym "one of the last vestiges of humanism remaining in an increasingly numeralized and computerized society."[35] Although I heartily agree that eponyms lend color to science history, I disagree with the pejorative reference to computerization. It is precisely the computer that has enabled ISI® and others to immortalize or honor scholars who have made significant discoveries that were never eponymized or otherwise recognized. Identifying *Cita-*

tion Classics is only one way we use the computer to honor such scholars.

In spite of all the positive reasons for using eponyms, they do have some rather annoying features. For one thing, a disease may have more than one eponym. For example, *Weil's disease*, an infectious disease transmitted by rats, is also known as *Fiedler's disease*, *Landouzy's disease*, *Mathieu's disease*, and *Vasilev's disease*.[23] Who is to say which is the preferred term? And like other forms of natural language, eponyms can be ambiguous. Percivall Pott's eponyms could even be considered homographs. These include *Pott's disease*, *Pott's fracture*, *Pott's gangrene*, *Pott's paralysis*, and *Pott's puffy tumor*.[23] No doubt these eponyms are occasionally confused with each other. Even worse are the cases of eponymy where only a number distinguishes different diseases, as in *Albright's syndrome (1)*, *Albright's syndrome (2)*, *Albright's syndrome (3)*, and *Albright's syndrome (4)*.[23] But is this any more confusing than labeling histamine antagonist receptors H_1 or H_2? These mnemonic designations are characteristically not very self-seeking. Some more eponymously minded fellow than Sir James Black might have called them $Black_1$ or $Black_2$ receptors.[36]

Double and triple eponyms also exist, and these can be unwieldy. Sometimes a double eponym denotes a full name, as in the *Austin Flint murmur*[37] in cardiology. Occasionally, it is a hyphenated last name, as in *Gilbert-Dreyfus syndrome*,[38] a form of abnormal sexual development. More often, double and triple eponyms acknowledge researchers who were co-workers, as in the *Weinberg-Himelfarb syndrome*,[39] a congenital cardiac defect, or who worked independently on the same discovery, as in *Chediak-Higashi syndrome*. This hereditary white blood cell disorder was described at about the same time by M.M. Chediak[40] in France and O. Higashi in Japan.[41] We would expect the papers associated with such a double eponym to be frequently cited together and to help identify a research front.

As suggested earlier, multiple eponyms may also commemorate both original and later describers. For example, as early as 1866 J.Z. Laurence and R.C. Moon reported cases of what is now known as *Laurence-Moon-Biedl syndrome*, a hereditary syndrome involving abnormal development.[42] But this report attracted little attention until A. Biedl redescribed the syndrome in 1922.[30,43]

Presumably, multiple eponyms provide a way of sharing credit fairly among scientists. But they do so at the cost of conciseness. Clearly, the quadruple eponym *Charcot-Marie-Tooth-Hoffman syndrome* is more cumbersome than the descriptive term, "neuropathic muscular atrophy." With the current trend toward team research, multiple eponymy could become even more awkward. What if every member of a five- or six-person research team were included in an eponym? An alternative might be to use some kind of team name such as the Framingham study. This is somewhat akin to using a fictitious name for collective effort, as was used by the group known as the pseudonymous French mathematician, N. Bourbaki.

Inconsistent usage is another problem with eponyms. For example, some authors mistakenly put a hyphen between the two names of an eponym formed from a single individual's full name, as in Austin-Flint. Others mistakenly omit the hyphen from a double eponym formed from two different last names, as in Chediak Higashi. The use of the possessive "s" is another sticky point. The *Journal of the American Medical Association* (*JAMA*) no longer uses the possessive for eponyms.[44] The editors reason that the eponymized persons didn't own the disease and in few cases did they suffer it. Thus, this style gives us *Hodgkin disease* and *Menkes syndrome*. Still, I'm surprised that *JAMA* would abrogate intellectual property rights! Many of the current articles consulted for this essay do use the possessive form. It certainly seems more appropriate for nonclinical eponyms. In any science, an original

theory is an individual's intellectual invention.

Despite the drawbacks of eponyms, many hope to be eponymized. Robert K. Merton has observed that "eponymity, not anonymity, is the standard" of recognition in science.[22] (p. 302) And, C.K. Tashima, a Houston physician, has facetiously described the *Tashima syndrome*,[45] a condition in which a physician searches for a new sign, disease, or syndrome to attach his or her name to.

As Merton made clear in his 1957 paper, "Priorities in scientific discovery," in *The Sociology of Science*, eponymy is "the most enduring and perhaps most prestigious kind of recognition institutionalized in science."[22] (p. 300) At the top of the eponymic ladder he outlines are the few major figures who have given their names to whole epochs, such as Newton, Darwin, and Freud. Then come scientists whose names are associated with fields, subfields, and disciplines, such as Robert Boyle, the "father of chemistry," and Willard Gibbs, the "father of physical chemistry." The lesser ranks of eponyms include laws, theorems, hypotheses, constants, diseases, body parts, plants, etc. Below eponyms come other scientific rewards, such as medals, prizes, and memberships in honorary academies and societies.

According to Merton, eponyms, as part of the reward system of science, reward originality. Stephen M. Stigler, University of Chicago, Illinois, holds a complementary view.[46] He believes that eponyms do not reward the isolated achievement of an original discoverer, because they are usually wrongly attributed. In fact, he has impishly formulated *Stigler's law of eponymy*, which states that eponyms are *never* named after the original discoverer. Besides facetiously pointing out that "St. Matthew did not discover the Matthew effect,"[46] (p. 148) he cites, among many others, the examples of *Laplace transforms* and *Giffen's paradox*. Apparently, Joseph Lagrange presented Laplace transforms before Pierre Laplace ever began his scientific career. And Simon Gray published Giffen's paradox before Robert Giffen was born. Furthermore, no reference to what has come to be known as Giffen's paradox has been found anywhere in Giffen's writings.

Stigler explains the prevalence of misattribution by pointing out that eponyms are not bestowed by science historians devoted to tracing the evolution of an idea. Rather, eponyms have typically been bestowed by a community of scientists distant in time and place from the scientist being honored. According to Stigler, this distancing adds to the prestige of eponyms by making it seem as if they are bestowed objectively. Stigler maintains that although eponyms don't commemorate original discoverers, they still play a valuable role in the reward system of science. The persons they do honor usually have done some work related to the discovery and have made important general contributions. Thus, eponymy is a reward for general scientific merit.

Articles by Mark M. Ravitch, University of Pittsburgh and Montefiore Hospital, Pennsylvania, who has made a special study of eponyms, tend to support Stigler's view.[31,47,48] Ravitch contends that for most eponyms one or more of the following four statements is likely to be true: the eponymized person wasn't the first describer of the discovery; the eponymized person didn't correctly understand the discovery; the eponym's current meaning differs greatly from the original idea; or the attribution has no historical basis whatsoever.

Whether or not Stigler's law holds true is a question for science historians. Perhaps an exception will help prove the rule! Consider Pott's fracture. Surely Pott earned this eponym legitimately. After all, he described—not a patient's fracture—but his own. He suffered this fracture of the lower leg bones when he was thrown from his horse.[49] It is possible that someone previously described such a fracture, but could it have been exactly the same? Having suffered a broken leg, I can testify that it seemed

painfully unique at the time. I tried unsuccessfully to convince my daughter Laura of this when she repeated this folly. However, instead of a skateboard she chose to use rollerskates.

Suffering a unique injury or disease yourself is a rather extreme way of establishing your priority. A less risky way of getting around Stigler's law might be simply to adopt Stigler's own ironic practice and eponymize yourself. Not surprisingly, this practice is often frowned upon. Recently, Peter Newmark, deputy editor of *Nature*, gently chided two scientists for naming a virus after themselves.[50] Yet, as Kay has noted, self-eponymy is the norm among taxonomists in many fields.[33] He has urged medical practitioners to drop their modesty and boldly name new discoveries after themselves.

I've had a hand in this game. Several years ago I proclaimed *Garfield's law of concentration*[51] and *Garfield's constant*.[52] Garfield's law of concentration is not really a law but a principle. It asserts that a small group of multidisciplinary and high-impact specialty journals account for a large percentage of references and publications in all fields of science. Garfield's constant refers to the average number of citations per cited paper in the annual *Science Citation Index®* (*SCI®*). The constant might have been forgotten had not Derek J. de Solla Price reminded the world about it in discussing Merton's theory of cumulative advantage.[53] But only time will tell whether my eponyms will survive over the long term, and whether I'll have successfully sidestepped Stigler's law. Samuel Bradford, beware![54]

To the extent that Stigler's law holds true, perhaps poor communication in earlier eras might partly explain it. Over the long interval between a discovery and the conferring of its eponymic name, it was much easier for misattribution to occur. In the present era of rapid worldwide communication, retrieval and dissemination services make it less likely that discoveries are attributed to the wrong person or group. I say this knowing full well that there are exceptions to general practice. In addition to this improvement in communication, the time interval Stigler describes for bestowing eponyms has shrunk in today's faster-paced science.

Consider the birth defect known as *Antley-Bixler syndrome*, which involves multiple deformities. This eponym was first used in a 1979 paper[55] by M. Michael Cohen, Dalhousie University, Nova Scotia, only four years after the 1975 report[56] by Ray Antley and David Bixler, both of Indiana University-Purdue University Medical Center, Indianapolis, Indiana. Contemporary search tools should have made readily available any references to such a syndrome that predated Antley and Bixler.

Of course, contemporary search tools are not infallible. Even searching for papers on well-established eponyms presents its own special problems. The traditional indexing services deal with eponyms in a variety of ways. If the eponym is a commonly used term, it may be an authorized search term. Otherwise, it may be cross-referenced with an authorized search term. But sometimes it's neither. For example, *Index Medicus* doesn't use *Sweet's syndrome* as either a subject heading *or* a cross-reference. According to Clifford A. Bachrach, editor of *Index Medicus*, the National Library of Medicine doesn't prefer descriptive terms over eponymic terms in selecting terms for its Medical Subject Headings (MeSH). Rather, selection reflects common usage in the medical literature.[57] It is estimated, however, that less than two percent of MeSH terms are eponyms. Incidentally, I first met Cliff at Johns Hopkins University in 1951, where we shared an interest in punched card machines.

You can, of course, do a title-word search online or with the *Permuterm® Subject Index* section of *SCI*. This approach varies in effectiveness because authors don't always include eponyms in the titles of papers. But one limited study of the medical literature indicated that a surprising number of titles *do* in-

clude the relevant eponym.[58] Jata S. Ghosh, Wyeth International, Radnor, Pennsylvania, found that 72 percent of 2,435 papers on syndromes and diseases listed in the 1973 *Index Medicus* used eponyms in the titles. This finding is tentatively corroborated by searches of the *ISI/BIOMED®* data base for 1980-1983 using as search terms the eponyms Hodgkin's disease and *Cushing's syndrome*. These search terms yielded 1,107 papers with Hodgkin's disease and 199 papers with Cushing's syndrome in their titles. In contrast, a search using the equivalent descriptive terms, *lymphogranuloma* and *hyperadrenocorticism*, retrieved only 24 papers for each term. Nevertheless, use of eponyms in titles varies from disease to disease. A search by the eponym *Hansen's disease* yielded only 16 papers, whereas the descriptive term *leprosy* yielded 685 papers.

Another approach to searching the literature for eponymized topics is to use the *Citation Index* section of *SCI*. There you can find papers that have cited the "primordial reference."[59] The primordial reference is the paper that constitutes the best starting point for a search. It is often, but not necessarily, the first published work on a concept. It may also be a highly cited paper by someone other than the original discoverer, whose work has become more closely associated with the concept. In the early days of *SCI*, we did a number of eponymic literature searches to demonstrate the unique power of citation indexing. You may remember *Kwok's disease*, named after Robert H.M. Kwok, the physician who first described the *Chinese restaurant syndrome*.[60] This unusual name refers to a set of symptoms that may be caused by monosodium glutamate intolerance. When we did our search on Kwok's disease, we didn't start by looking it up in the subject indexes. Instead, we searched our *SCI* files for citations to Kwok's 1968 letter to the *New England Journal of Medicine*, the first published account of the syndrome. This primordial reference led us to a list of appropriate citing papers.

There's no reason why searching by primordial reference should be limited to eponymic searches. Stephen P. Pope, Broadgreen Hospital, Liverpool, England, explained recently in the *British Medical Journal*[61] how he keeps up with literature of the interscalene brachial plexus block by checking the primordial reference[62] in each year's *SCI*. He points out that later researchers are almost bound to cite the primordial reference. He feels that *SCI* has a considerable advantage over *Index Medicus* in that it allows this type of searching.

This discussion of primordial references reminds me of an as yet unfulfilled "promise" I have made on several occasions. I've often talked about an *ISI Dictionary of Primordial References*.[63] In this compilation, one would find the primordial reference for eponymic as well as other important discoveries. This is not as simple to do as you might imagine. The cases of misattribution and multiple attribution described here show how difficult it is to link the correct original published work with a discovery. And even if you determine the technically correct work, it may not be the one most commonly identified with the eponym or the discovery.

There are, of course, numerous dictionaries and other reference works that supply references up to a point. Most relevant to this discussion is Jablonski's *Illustrated Dictionary of Eponymic Syndromes and Diseases and Their Synonyms*,[23] mentioned earlier. It supplies the references associated with each eponym it lists. However, the editor hints at difficulties in providing references by noting that some of the eponyms were untraceable, and that the titles of some of the references couldn't be verified. For example, no paper by Roch could be identified for *Roch's lipomatosis*. The dictionary lists only a 1954 paper by H. Bernard. And for *Niemann-Pick disease*, the dictionary lists a 1914 paper by Niemann, but the reference is starred to indicate that it can't be verified.

This is not the place to elaborate on the full details of a comprehensive, dy-

namic dictionary of primordial terms or citations. Suffice it to say that we already have several sources of primordial papers to draw on. For example, we could use our files of most-cited papers. This is one of our basic tools in identifying *Citation Classics*. Another route to primordial references is co-citation clustering.[64] In the course of developing the ISI Search Network, we have identified core papers for thousands of specialty areas in all fields of science. These clusters of core papers and their associated research front names can be hierarchically classified and constitute a detailed thesaurus for online searching.

Co-citation clustering also provides a tool for obtaining a comprehensive bibliography on eponymic topics. In our *Index to Scientific Reviews* ™ (*ISR* ™), review papers are assigned to one or more research front specialties. Suppose you want information on *Kaposi's sarcoma*. If you look under Kaposi's sarcoma in the *ISR Permuterm Subject Index*, you'll find the names of authors who have written current reviews on this subject. The next step is to turn to the *Source Index* and look up the author. If the author's paper is associated with a research front, it will be so tagged. When you look up the appropriate number in the *Research Front Specialty Index*, you'll find the research front specialty named, "Preventing infections in cancer patients," and a list of reviews citing core literature in this specialty. Since review papers provide extremely wide coverage of a subject, each paper in itself should supply an extensive bibliography. Taken together, the collective bibliography that the group of reviews provides should be quite thorough.

Clearly, searching for papers associated with eponyms requires a special approach. The way these papers are cited may also vary from the norm. Many eponyms are associated with multiauthored papers. Quite often, the "senior" author is not the first author. This can lead to incorrect citation, in which the senior author rather than the actual first author is cited. Consider the case of Eschenmoser hydrolysis. The correct primordial citation is F. Elsinger, J. Schreiber, and A. Eschenmoser, "Notiz über die Selektivität der Spaltung von Carbonsäure-methylestern mit Lithiumjodid," *Helvetica Chimica Acta* 43:113-8, 1960.[65] However, Albert Eschenmoser, Swiss Federal Institute of Technology, Zurich, is sometimes cited as the first author. The error is understandable considering Eschenmoser's eminence. We anxiously await his commentary on this paper, one of several classics he has written. Although, in this case, the error occurred about three percent of the time, there are other cases in which the percentage is higher. It drives librarians and editors to distraction when they try to verify such incorrect citations.

Whatever such disadvantages eponyms may have, I believe they are outweighed by their benefits. Eponyms remind us that science and scholarship are the work of dedicated people. They allow us to immortalize sometimes obscure but deserving persons. It is clear that they represent a natural language way of expressing complex ideas and it is for this reason that they have often been cited as a useful first approach to searching with title-word and citation indexes, as well as with controlled vocabularies where they are used.

* * * * *

My thanks to Patricia Lawson and Amy Stone for their help in the preparation of this essay.

REFERENCES

1. Eponym. (Murray J A H, Bradley H, Craigie W A & Onions C T, eds.) *The Oxford English dictionary*. Oxford: Clarendon Press, 1961. Vol. III. p. 250.

2. **Gove P B,** ed. *Webster's third new international dictionary of the English language.* Springfield, MA: Merriam, 1968. 2662 p.
3. Preface. (Ruffner J A, ed.) *Eponyms dictionaries index.* Detroit, MI: Gale Research, 1977. p. vii-ix.
4. **Beeching C L.** Introduction. *A dictionary of eponyms.* New York: K.G. Saur, 1983. p. 7-8.
5. **Thrush P W,** ed. *A dictionary of mining, mineral, and related terms.* Washington, DC: US Department of the Interior, Bureau of Mines, 1968. 1269 p.
6. **Wolk A.** Clothing: a complete wardrobe. *Everyday words from names of people & places.* New York: Elsevier/Nelson, 1980. p. 164-93.
7. **Rowton M B.** Chronology: Babylonian and Assyrian. *Encyclopaedia Britannica. Macropaedia.* Chicago: H.H. Benton, 1974. Vol. 4. p. 576-7.
8. **von Soden W T.** Mesopotamia and Iraq, history of: II. Mesopotamia from 1600 BC to AD 630. *Encyclopaedia Britannica. Macropaedia.* Chicago: H.H. Benton, 1974. Vol. 11. p. 979-89.
9. **Sealey B R.** Greek civilization, ancient: II. The Greek city-state. *Encyclopaedia Britannica. Macropaedia.* Chicago: H.H. Benton, 1974. Vol. 8. p. 334-49.
10. **Rang M.** The Ulysses syndrome. *Can. Med. Assn. J.* 106:122-3, 1972.
11. **Vaisrub S.** Mythologic eponyms updated. *J. Amer. Med. Assn.* 220:724, 1972.
12. **Burwell C S, Robin E D, Whaley R D & Bickelmann A G.** Extreme obesity associated with alveolar hypoventilation—a Pickwickian syndrome. *Amer. J. Med.* 21:811-8, 1956.
13. **Boyd R V & Woodman J A.** The Jekyll-and-Hyde syndrome. *Lancet* 2:671-2, 1978.
14. **Dawber T R.** *The Framingham study: the epidemiology of atherosclerotic disease.* Cambridge, MA: Harvard University Press, 1980. 258 p.
15. **Brody J E.** Lyme disease broadens its range. *NY Times* 28 June 1983, p. C1; C3.
16. **Fraser D W, Tsai T R, Orenstein W, Parkin W E, Beecham H J, Sharrar R G, Harris J, Mallison G F, Martin S M, McDade J E, Shepard C C, Brachman P S & the Field Investigation Team.** Legionnaires' disease. *N. Engl. J. Med.* 279:1189-97, 1977.
17. **Baron D N, Dent C E, Harris H, Hart E W & Jepson J B.** Hereditary pellagra-like skin rash with temporary cerebellar ataxia, constant renal amino-aciduria, and other bizarre biochemical features. *Lancet* 2:421-8, 1956.
18. **Hutchinson J.** Cases of Mortimer's malady. *Archives of surgery.* London: West, Newman, 1898. Vol. IX. p. 307-14.
19. **Dirckx J H.** Eponyms. *The language of medicine.* New York: Harper & Row, 1976. p. 75-9.
20. **Wolk A.** The mineral kingdom. *Everyday words from names of people & places.* New York: Elsevier/Nelson, 1980. p. 64-77.
21. **Ballentyne D W G & Lovett D R.** *A dictionary of named effects and laws in chemistry, physics and mathematics.* New York: Chapman and Hall, 1980. 346 p.
22. **Merton R K.** Priorities in scientific discovery. *The sociology of science: theoretical and empirical investigations.* Chicago: University of Chicago Press, 1973. p. 286-324.
23. **Jablonski S.** *Illustrated dictionary of eponymic syndromes and diseases and their synonyms.* Philadelphia: Saunders, 1969. 335 p.
24. **Skinner H A.** Introduction to second edition. *Origin of medical terms.* New York: Hafner, 1970. p. vii-x.
25. **Coetzee T.** Letter to editor. (Anatomical names, eponyms and angiography.) *S. Afr. Med. J.* 63(9):305, 1983.
26. **Cogan D G.** The rise and fall of eponyms. *Arch. Ophthalmol.* 96:2202-3, 1978.
27. **O'Brien J S.** Citation Classic. Commentary on *Science* 165:698-700, 1969. *Current Contents/Life Sciences* 24(45):16, 9 November 1981.
28. **Möller I O L.** Zwei Fälle von acuter Rachitis. (Two cases of acute rickets.) *Konigsb. Med. Jahrb.* 3:135-49, 1862.
29. **Barlow T.** On cases described as "acute rickets" which are probably a combination of scurvy and rickets, the scurvy being an essential, and the rickets a variable, element. *Med.-Chirurg. Trans.* 66:159-209, 1883.
30. **Rolleston H.** Medical eponyms. *Ann. Med. Hist.* 9:1-12, 1937.
31. **Ravitch M M.** Dupuytren's invention of the Mikulicz enterotome with a note on eponyms. *Perspect. Biol. Med.* 22:170-84, 1979.
32. **Lennox B,** ed. *Ffrangcon Roberts' medical terms: their origin and construction.* London: William Heinemann Medical, 1980. 132 p.
33. **Kay H E M.** In praise of eponyms. *Lancet* 2:1256, 1973.
34. **Schmickel R D.** Letter to editor. (Limiting eponyms.) *J. Pediat.* 102(3):485-6, 1983.
35. **Robertson M G.** Letter to editor. (Fame is the spur the clear eponym doth raise.) *J. Amer. Med. Assn.* 221:1278, 1972.
36. **Garfield E.** Since 1816 the John Scott and other Philadelphia awards have recognized "useful" scientific discoveries—James Black and Benjamin Rubin head a list of recent distinguished recipients. *Essays of an information scientist.* Philadelphia: ISI Press, 1983. Vol. 5. p. 686-94. (Reprinted from: *Current Contents* (38):5-13, 20 September 1982.)
37. **Flint A.** On cardiac murmurs. *Amer. J. Med. Sci.* 44(7):29-54, 1862.

38. **Gilbert-Dreyfus M, Savoie J C, Sébaoun J, Alexandre C & Belaisch J.** Étude d'un cas familial d'androgynoidisme avec hypospadias grave, gynécomastie et hypergestrogénie. (Study of a hereditary case of androgynoidism with severe hypospadias, gynecomasty and hyperestrogenemia.) *Ann. Endocrinol.* 18:93-101, 1957.
39. **Weinberg T & Himelfarb A I.** Endocardial fibroelastosis (so-called fetal endocarditis). *Bull. Johns Hopkins Hosp.* 72:299-306, 1943.
40. **Chediak M M.** Nouvelle anomalie leucocytaire de caractere constitutionnel et familial. (New leukocyte anomaly of constitutional and familial character.) *Rev. Hematol.* 7:362-7, 1952.
41. **Higashi O.** Congenital gigantism of peroxidase granules. *Tohoku J. Exp. Med.* 59:315-32, 1954.
42. **Laurence J Z & Moon R C.** Four cases of retinitis pigmentosa occurring in the same family and accompanied by general imperfections of development. *Ophthalmol. Rev.—London* 2:32-41, 1866.
43. **Biedl A.** Geschwisterpaar mit adiposo-genitaler dystrophie. (Sibling pair with adiposogenital dystrophy.) *Deut. Med. Wochenschr.* 48:1630, 1922.
44. **Archer J.** Epitomes. *J. Amer. Med. Assn.* 234:152, 1975.
45. **Tashima C K.** Letter to editor. (Tashima's syndrome.) *J. Amer. Med. Assn.* 194:208, 1965.
46. **Stigler S M.** Stigler's law of eponymy. (Gieryn T F, ed.) *Science and social structure: a festschrift for Robert K. Merton.* New York: NY Academy of Sciences, 1980. p. 147-57.
47. **Ravitch M M.** Eponyms. *Med. Times* 96:1149-51, 1968.
48. ----------. Poland's syndrome—a study of an eponym. *Plast. Reconstr. Surg.* 59:508-12, 1977.
49. **Hatcher J.** Fame is a name. *Nurs. Times* 68:1298-9, 1972.
50. **Newmark P.** Names not to be forgotten. *Nature* 303(5920):749, 1983.
51. **Garfield E.** The mystery of the transposed journal lists—wherein Bradford's law of scattering is generalized according to Garfield's law of concentration. *Essays of an information scientist.* Philadelphia: ISI Press, 1977. Vol. 1. p. 222-3. (Reprinted from: *Current Contents* (31):5-6, 4 August 1971.)
52. ----------. Is the ratio between number of citations and publications cited a true constant? *Essays of an information scientist.* Philadelphia: ISI Press, 1977. Vol. 2. p. 419-21. (Reprinted from: *Current Contents* (6):5-7, 9 February 1976.)
53. **Price D J D.** A general theory of bibliometric and other cumulative advantage processes. *J. Amer. Soc. Inform. Sci.* 27:292-306, 1976.
54. **Garfield E.** Bradford's law and related statistical patterns. *Essays of an information scientist.* Philadelphia: ISI Press, 1981. Vol. 4. p. 476-83. (Reprinted from: *Current Contents* (19):5-12, 12 May 1980.)
55. **Cohen M M.** Craniosynostosis and syndromes with craniosynostosis: incidence, genetics, penetrance, variability, and new syndrome updating. *Birth Defects—Orig. Art. Ser.* 15(5B):13-63, 1979.
56. **Antley R & Bixler D.** X-Trapezoidocephaly, midfacial hypoplasia and cartilage abnormalities with multiple synostoses and skeletal fractures. *Birth Defects—Orig. Art. Ser.* 11:397-401, 1975.
57. **Bachrach C A.** Telephone communication. 19 October 1983.
58. **Ghosh J S.** Occurrence of disease and syndrome eponyms in the titles of medical literature. *Methods Inform. Med.* 14:34-8, 1975.
59. **Garfield E.** The citation index as a search tool. *Citation indexing—its theory and application in science, technology, and humanities.* Philadelphia: ISI Press, 1983. p. 41-61.
60. **Kwok R H M.** Letter to editor. (Chinese-restaurant syndrome.) *N. Engl. J. Med.* 278:796, 1968.
61. **Pope S P.** Letter to editor. (Are you making the most of "Index Medicus"?) *Brit. Med. J.* 285:1276, 1982.
62. **Winnie A P.** Interscalene brachial plexus block. *Anesth. Analg.* 49:455-66, 1970.
63. **Garfield E.** Citation indexing and the sociology of science. *Essays of an information scientist.* Philadelphia: ISI Press, 1977. Vol. 1. p. 156-74. (Reprinted from: *Current Contents* (15):M23-4, 14 April 1971.)
64. ----------. ABCs of cluster mapping. Parts 1 & 2. Most active fields in the life and physical sciences in 1978. *Essays of an information scientist.* Philadelphia: ISI Press, 1981. Vol. 4. p. 634-49. (Reprinted from: *Current Contents* (40):5-12, 6 October 1980 and (41):5-12, 13 October 1980.)
65. **Elsinger F, Schreiber J & Eschenmoser A.** Notiz über die Selektivität der Spaltung von Carbonsäure-methylestern mit Lithiumjodid. (Note on the selectivity of the cleavage of carboxylic acid-methyl esters using lithium iodide.) *Helv. Chim. Acta* 43:113-8, 1960.