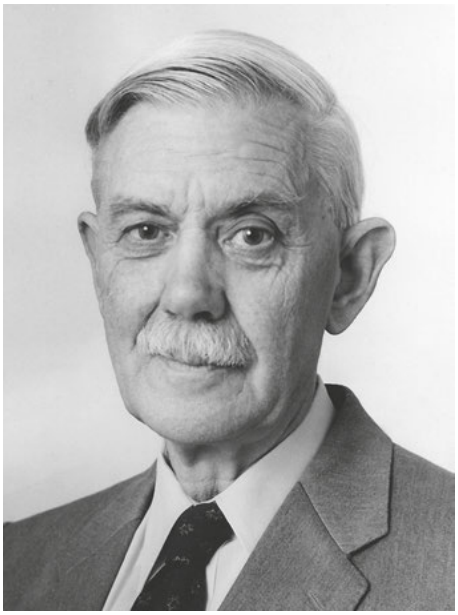
Obituary.
In Memoriam:
Eric Coates, 1916–2017



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With regret I received the sad report from England that Eric James Coates had passed away on 5th December 2017 at the age of 101. He was one of the most prominent figures in the field of classification and information retrieval and made important contributions in the application of theory to practice in the United Kingdom (UK) in the twentieth century. He was also one of the original members of the Classification Research Group (CRG) formed in London in 1952, which was influenced by Ranganathan's thought.

Coates entered the library profession as a junior assistant in 1934 and embarked on a career in public libraries. His first appointment was at Merton and Morden public libraries (London) where he served from 1934 to 1940. Next, he served at Dagenham public libraries (London) from 1940 to 1941. In 1946, after World War II, he became a Fellow of the Library Association and in the same year he became a cataloguer at Watford public libraries where he served until 1949.

The turning point of his career was his success in the 1949 selection process to appoint staff for the newly established *British National Bibliography* (*BNB*). *BNB* commenced its services in January 1950 under the editorship of Arthur James Wells (alias Jack Wells) who shortly became a founding member of the CRG. The first year of *BNB* operated with a staff of eight. Coates was one of the four qualified cataloguers who had been appointed late in autumn of 1949. At that time, he thought of himself as the possessor of some degree of expertise in cataloguing rather than classification. But after a few months at *BNB* he was appointed as head of the subject cataloguing side of the enterprise. The following are his professional career stages beginning with that turning point:

1950-1961	Chief Subject Cataloguer, *BNB*
1962-1976	Editor, *British Technology Index*
1977-1990	Rapporteur, FID/BSO Panel
1991-1992	Rapporteur, BSO Panel
1993-2000	Director, BSO Panel Ltd, UK

BNB was a classified bibliography designed primarily for systematic search of books, pamphlets and monographs

published in the UK. The classification scheme employed at *BNB* was the *Dewey Decimal Classification* (*DDC*). *DDC* matched up neither to the specificity required even at book level, nor to the need for a consistently ordered display of classified material. To mitigate this problem, *BNB* adopted Ranganathan's method of facet analysis using the PMEST formula. The superimposition of the facet formula on a non-faceted scheme of *DDC* was carried out without notation. The practice was called "verbal extensions." An accumulation of faceted extensions was published by *BNB* as *Supplementary Classification Schedules* in 1963. The classified section of *BNB* was supplemented with a chain index originally devised by Ranganathan. *BNB* fully carried out Ranganathan's idea, which had not previously been put into practice outside India (Wells 1957).

Coates (1960) published a valuable book on subject catalogues. While the ideas set out in the book were an outcome of the ten years' experience with *BNB* and regular discussions at the CRG meetings, he put forth a new approach to alphabetical subject catalogues. The new approach comprised a set of syntactic rules based on Ranganathan's facet analysis as further illuminated by Jason Farradane's relational system. Coates presented a copy of the book to Ranganathan, who approved of it, overlooking its occasional heresies, but added the admonition, "One cannot teach by the printed word alone." Just at that time, it was felt in the UK that there was a need for a technical indexing service. There had been two commercial efforts to provide such a service in the UK in the 1950s, both of which had failed. Coates did not shrink from the venture to put his idea into practice. He became the first editor of the *British Technology Index* (*BTI*) which was commenced by the Library Association (LA), London in February 1962.

BTI was a publishing venture of the LA in the 1960s. The LA granted Coates losses for three years. At the end of its first year, however, *BTI* had attained 1,030 subscriptions, which exceeded the proposed target. By the end of the third year, it was running at 1,410 subscriptions, which was around the break-even point. After that, BTI's subscriptions increased steadily. At the end of the 1970s, the LA announced that the *Library and Information Science Abstracts* (*LISA*) and *BTI* provided a large proportion of publishing income and that their continued growth and strength were of high priority.

BSO (*Broad System of Ordering*) was constructed at FID in association with UNESCO in the framework of the UNISIST programme and was intended as a switching mechanism for various indexing languages. The project started in 1973, and the first hard copy publication appeared in 1978. During this period, ten classificationists contributed towards the completion of *BSO*, of whom four were from the FID/CCC, four from the FID/CR and two co-opted. Coates was the latest member who was asked to join the project in a co-opted member capacity. However, as Geoffrey Arthur Lloyd who had been first rapporteur of the FID/*BSO* Panel from September 1974 to August 1977 persuaded Coates to take up the rapporteurship, it was largely thanks to Coates' energy and expertise that the raw *BSO* draft was refined, completed, subjected to a field test in 1977 and finally published in 1978.

Following the publication of the *BSO—Broad System of Ordering: Schedule and Index* in 1978 and of *The BSO Manual* in 1979, the BSO Switching Test of 1981 and the BSO Referral Test of 1982/83 were carried out. Based largely upon the findings and experience of these field tests, revision of *BSO* was set forward. However, due to the financial crisis of FID and UNESCO, *BSO* lost support in 1990 and was two years later incorporated as the BSO Panel Ltd in the UK. The revised *BSO* in machine-readable form was released in 1991. While *BSO* had been developed in the framework of the UNISIST programme, the scheme did in many respects reflect the work of the CRG. In 2000, *BSO* came under the management of University College London's School of Library, Archive and Information Studies (now the Department of Information Studies). They set up a website for *BSO*, and the machine-readable version of the *BSO* 4th revision has been made available free of charge (http://www.ucl.ac.uk/fatks/bso/).

The grafting of a faceted structure onto a non-faceted classification by *BNB* was a decisive departure from previous subject cataloguing practice which had been regarded as a virtually intuitive art or craft. Communicable procedures became very important in operations requiring teams of classifiers or classification compilers. The following are indexing languages that Coates developed or played a major part in developing based on faceted classification principles:

1957 *British Catalogue of Music Classification*
1962 *British Technology Index-type*
1978 *Broad System of Ordering*, 3rd revision
1991 *Broad System of Ordering*, 4th revision
2012 *BC2 Class C Chemistry*

BNB started to issue the *British Catalogue of Music* (*BCM*) in May 1957. *BCM* was also a classified bibliography supplemented with a chain index as *BNB* was. The classification scheme used for *BCM*, i.e., the *British Catalogue of Music Classification* (*BCMC*), was published by *BNB* in 1960. This faceted classification was compiled by Coates as a result of a discussion with a small committee of music experts. The subject field of music required a variety of facets. Coates recognized ten facets in compiling

BCMC. *BCMC* had another prominent feature for its "retroactive notation," which did not rely upon facet indicators. For a larger notational base than that of a decimal system, *BCMC* employed the Roman alphabets. The reversal of schedule and citation order was the actual practice of faceted classification. The combination of facets could be recognized without facet indicators by using a technique which apportioned part of the alphabet to serve as an invisible facet link indicator while reserving another part to accommodate enumerated topics. At the 1957 Dorking Conference in a paper entitled "Notation in Classification," Coates demonstrated that there was a mutual constraint between notational hospitality and expressiveness. *BCMC* adopted hierarchically non-expressive notation. Accordingly, *BCMC* fulfilled all the three notational requirements: simplicity, brevity and hospitality. Though retroactive notation in itself is not new in the history of library classification, it is again used in the volumes of the *Bliss Bibliographic Classification* 2nd edition (*BC2*) which have so far appeared.

The indexing methodology of *BTI* was governed by the same rules as described in Coates' 1960 book. Following subject analysis in his own words, the indexer analyzed the relation between categories of concepts and formulated the subject heading by reference to the *BTI* Relationship Table which was also carried in the introduction to annual volume. Subject terms in a syntactic citation string were connected by a small set of punctuation marks, each of which indicated the degree of conceptual closeness. For instance, the comma was used for generic relations, and the colon and the semicolon were used for syntactic relations. Cross-references were produced both from articulated subject headings by using chain procedure and from an authority file. The page layout of *BTI* interestingly exhibited a "block structure" of related subjects, which was quite helpful for broad searching. This kind of collocation was due to the logically articulated subject headings and to the underlying classificatory principle throughout the indexing procedure.

BSO incorporated many of the theoretical developments in information retrieval which emerged after World War II. The order of *BSO* main classes is more different from most conventional schemes than it appears. *BSO* is based primarily on the theory of integrative levels. While there are some deviations from conventional practices, including the separation of religion from philosophy, careful arrangement of *BSO* main classes exhibits an interesting collocation. *BSO* is a discipline-oriented general scheme, but phenomena- or mission-oriented classes are in the sequence of main classes. In addition to these inherent phenomena classes, provision for accommodating works with all or many aspects of phenomena is made at the top of the schedules. The schedules of *BSO* are constructed by considering both facets and relations, which is reflected in two kinds of combination rules. The procedure for internal combination is a simple clerical one that links notations in reverse schedule order. External linkages that cross combination area boundaries require analysis of the relation of the link connecting the elements. In *BSO*, combination area is equivalent to subject field. Within each subject field, the schedule details are arranged in a facet pattern, which is repetitive or isomorphic from subject field to subject field. This brings two kinds of advantages. The first is simplicity in dealing with subject matters, which minimizes the dilemmas of classifiers. The second is predictability for a new concept, which enables both system revisers and users in a broad sense to find a logically correct place.

The outline of *BSO* had some close similarities with that of *BC2* (Coates 1995). This fostered mutual cooperation between the two schemes, an example of which has been the arrangement by which the computer programs of *BC2* were made available for use by *BSO*. Work on new *BC2* schedules gradually dominated the CRG during the 1990s. In this respect, as the focus of *BC2* has been on the sciences, Coates was a major player making use of his experience with *BTI* and with the development of *BSO* (McIlwaine and Broughton 2000). He collaborated on several of the *BC2* volumes, including *Class AY/B General Science and Physics*, *Class C Chemistry*, and *Class U/V Technology and Useful Arts*. Class C was regarded as the most formidable one, and Class U/V, which is expected to be the largest one in *BC2*, has been awaiting the completion of the pure science classes.

Douglas Foskett (1979, 259) who has been in charge of publicity for the CRG remarked, "the Classification Research Group ... has been the dominant influence on the theory and practice of classification and indexing: the *BNB* and *BTI* are eloquent witnesses." Brian Vickery (2004, 13) in his reminiscences remarked:

> Eric Coates was working as a cataloguer and classifier at the then recently established *British National Bibliography*. Earnest, sometimes a little severe, transparently sincere and humane, Eric later became the first editor of the *British Technology Index* and wrote a book, *Subject Catalogues: Headings and Structure,* much influenced by facet ideas. He has also played a major part in constructing and testing the *Broad System of Ordering,* a high-level classification system.

In addition to a bibliography of *BSO* (Kawamura 2011) and of *BTI* (Kawamura 2015), both of which are in classified order with every item having an English abstract, I have been maintaining a bibliography of published works by Coates. He authored 102 published works, of which the

number of books and independent reports was eleven, journal articles and conference papers sixty-seven, book reviews twenty, and memorial tributes four. Without exception, every work requires careful reading. Even a letter to the editor was based on his profound practical theory. Book reviews mostly carried in the *Journal of Documentation* were all first-class. Key papers (Coates 1964; 1973; 1978; 1988a; 1988b; 1997a; 1997b) were particularly difficult but rewarding. It is worth mentioning that many of his works, including some key papers, were reprinted. For instance, in 1978 the Society of Indexers published *Indexers on Indexing: A Selection of Articles Published in The Indexer* as the twenty-first anniversary publication to mark the establishment of the society. The fifty-nine articles reprinted from issues of *The Indexer* were carefully chosen. A reviewer mentioned in the 1979 *Journal of Documentation* that it was particularly good to see the four papers by Coates chosen for inclusion, that two of these articles were related to *BTI* and that each was still leading in its subject field. Besides these, other authors' *BTI*-related articles were included. Coates has delivered occasional lectures on indexing and classification at workshops, seminars and courses held by Aslib, the LA, the Society of Indexers and library schools.

Coates advanced the theory of classification through the practice of *BNB*, *BTI* and *BSO*. We must explore the underlying principles common to these three systems. It is well known that in his teaching on classification Ranganathan emphasized the model of a three-plane structure comprising the idea plane, the verbal plane and the notational plane. Coates recognized that the model abolished at a stroke the previous conventional wisdom that had completely separated alphabetical subject cataloguing from library classification. He restructured the three-plane model as the idea or concept plane and the symbol plane, the latter of which comprised the verbal or linguistic plane and the notational plane. The reduced model called attention to the unique place of natural language among symbol systems. Coates' intention was to make us notice that a pitfall lurked in such well-known propositions as "Concept formation takes place only with the help of words and language." While one cannot operate on the idea plane without calling up natural language in aid, there is an ever-present tendency for the symbol level to obscure the concepts that the symbols represent. Similarly, one cannot eliminate the forms of natural language from indexing language. Coates stresses that there is a one-to-one correlation between concept and symbol in classification. One can consign them to a relatively inconspicuous role, and Ranganathan carried this out in a very ingenious way. Thus, Coates concluded that Ranganathan arrived at his key proposition that all knowledge organization systems, whatever their form, needed to be based and derived from a classification scheme.

Coates' adherence to concept analysis bonded together classification. His practice and theory seem to be always based on a triad of the following principles:

– the basic unity of subject indication;
– relational analysis in the context of classification;
– recourse to classification in any case.

The first principle that Coates recognized, and inherited from Ranganathan, but not Ranganathan's own wording, embraces classification and subject indexing of all kinds. To put it simply, alphabetical subject indexing schemes possess, or should possess, some form of classificatory correlation. Coates recognized that Ranganathan's contribution in the field of knowledge organization was principally of two kinds: the first was the notion of the basic unity of subject indication mentioned above, and the second was his exhaustive illumination of problems of classification syntactics using the notion of facets. However, he added that Ranganathan was a traditionalist with regard to classification semantics. The second principle is a region that no one else has ever explored, though relational analysis itself had been advocated by Farradane early in the 1950s. The third principle underlying throughout Coates' 1960 book does indicate the need for a coherently structured new general classification reflecting a modern world view. It is here that *BSO* and *BC2*, when completed, might well be used as search aids in the likely increasing general accessibility of large scale information stores embracing all fields of knowledge, and a possible starting point model for use in in-depth research on classification semantics.

At the LA, Reference and Special Libraries Section, Technical Problems 1957 Conference held in April of 1957, Coates opened a discussion on classification problems. His lecture entitled "Indexing and Classification" was an analysis of the role of classification and drew attention to several of the problems arising out of the inability of the well-known general classifications to cater to the complexities of modern knowledge and the demands of modern library services. The discussion immediately showed a general dissatisfaction with the well-known schemes. The conference passed a resolution expressing this disapproval and asking the LA to initiate investigation into the possibility of making a new general classification scheme. At this point, the NATO report, *Increasing the Effectiveness of Western Science*, appeared in 1960. One of recommendations of the LA's Library Research Committee was that a new scheme of classification of science and technology would be an important factor in achieving the desired end. The LA approached NATO. This led to the award of a £5,000 grant and allowed the LA to support the 1963 London Conference organized by the

CRG. Coates (1964) gave a paper at the conference, but he could not be concerned any more with a pilot study for a new general classification. Two other CRG members carried out the pilot study full-time in association with the BNB/MARC project, but in the event, no general classification emerged. Sometimes deep in thought I am convinced that if Coates had remained at *BNB* a further several years from then, a new general classification would have been realized. But conversely, it is doubtful whether we would have seen *BTI*, which has been praised as "a masterpiece of subject index" in the field of science and technology edited by "the genius of subject indexing."

BTI was a very early example of a concept-controlled subject retrieval system that computerized its clerical and typesetting operations in an integrated manner. In recognition of the success of *BTI*, the LA awarded Coates the title of Honorary Fellow in 1979. In 1998, Coates was acknowledged by the Conference on the History and Heritage of Science Information Systems as one of the "Pioneers of Information Science" (http://faculty.libsci.sc.edu/bob/ISP/coates2.htm). It is regrettable that Coates was not recognized by Ranganathan-related commendations. I still believe that it was Coates who should have first received the Ranganathan Award, which was established by the FID/CR in 1975.

I first wrote to Coates early in 1984 with several questions about *BTI*. He gave me detailed answers, particularly about relational analysis in which I was most interested. At that time, I had a plan to publish a book entitled *Eric Coates and the British Technology Index*. However, he insisted that his name should not appear in the main title but in the subtitle, if any, for two reasons. First, he taught me a precept of Ranganathan, "It is the message that is all-important, not the messenger." Second, he persuaded me that he had indeed been leader of the team of *BTI* and more recently of *BSO*, but that any credit should be awarded to the teams as a whole. Meanwhile we discussed the field tests of *BSO*, so I decided to include *BSO* in the forthcoming book. He patiently encouraged me until the completion of the book. He wrote to me, "It is valuable someone in a distant land, across the culture barrier, has deciphered and understood the message." The book (Kawamura 1988), dealing comprehensively with Coates' contributions to knowledge organization since 1960, was published. Though written in Japanese, the book was exhibited at the Forty-fourth FID Congress held in Helsinki, Finland, 28 August to 1 September 1988, by the kind offices of Stella Keenan, the then Secretary General of FID. What pleased me most was when Coates complimented my line-by-line scrutiny, with colour-coded corrections and comments, of the *BSO* 1991 version. He appraised this as "a most valiant and valuable effort on behalf of BSO," and "this product is receiving treatment which will accord it the high Japanese standard of accuracy." The result of corrections was reflected in the *BSO* 1994 version, and I was invited to join the *BSO* Panel as Editorial Consultant in 1995.

It took twenty years until our meeting was realized on the occasion of the Eighth International ISKO Conference held at the University College London, 13 to 16 July 2004. Coates lived in St Albans, Hertfordshire. On the afternoon of 15th July, he visited me at the Bedford Hotel located between the British Museum (BM) and the Russell Square tube station. We enjoyed a frank discussion from 2:30 p.m. to 5:15 p.m., taking afternoon tea with cake. During the discussion a compact map of Bloomsbury that was distributed to each conference participant was utilized, because *BNB* started its services at a three-story building in the sphere of the BM and the *BTI* editorial office was near King's Cross Station from 1962 to 1978. When the meeting ended, Coates told me that he would go to King's Cross Station for the rush hour. As he had a walking stick I accompanied him. It took about twenty-five minutes on foot. On the way to the station he told me that when he served at *BNB* he used to walk the same route early in the morning in the depth of winter. I was fortunate to be scheduled to give a paper (Kawamura 2004) at the final session of the last day. On the afternoon of the same day, the organizing committee invited Eric Coates and Jack Mills as honoured guests, both well into their eighties, but still working on classification on a daily basis. After the session, I met Coates again and he introduced me to Mills. Following the previous memorable day, I again had an opportunity to talk with two prominent figures this time on the way to Euston station. During the first meeting with Coates, I learned his birthday was 18th May, a day before mine. We immediately recognized that if the time difference was taken into account, our birthdays were the same.

Due to the decline of classification, Coates' works have not been well understood and appreciated. Works achieved by a man of sharp insight into the crux of problems, the courage of standing up to problems now faced with, a strong will to achieve the target, a sense of responsibility and the capacity as a team leader are so great that they still remain to be rightly valued as a global standard for the future.

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