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Documentation and Kurma-Avatara
(Development of library science. 11).

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[A definition is established for the terms 'Document' and 'Documentation'. The beginning of documentation has been a result of social forces. The genesis and the development of documentation are under the triangle of the three forces emanating from the great increase in the number of research personnel, in the output of research as documents, and in the inner urge of the library profession to give its best to the well-being of the society. Controversies about the agencies for documentation and about the techniques for documentation have been going on from the beginning of the century. Just now they appear to be nearing a satisfactory end. Incidentally India's role in this matter is mentioned].

0 Take Off

In the Presidential Address of the Poona Iaslic Meeting in 1963, I defined the place of Documentation in the Spiral of Library Services (15). We shall begin this paper with a short account of the social purpose of Documentation. These are:—

- 1 To increase productivity in the industries;
- 2 To eliminate wastage in research potential and thereby accelerate research; and
- 3 To help the Government itself.

Running a Government largely on the basis of precedents culled out of the files and archives of the Government, will no longer serve the necessary social purpose of today. The Ministers and the Secretaries will have to draw fresh blood and adopt fresh views on the basis of the development of the theory and practice of Governmental work in all the countries of the world and on the basis of research being done on the subject by learned bodies marching ahead as torch bearers. Thus the Government itself is in need of Documentation.

1 Terminology

A long standing stumbling block in the progress of Documentation has been centering round the terms 'Document' and 'Documentation'. I may illustrate this controversy by a few experiences.

11 DOCUMENT

111 *Indian Experience*

I shall begin with an experience in our own country. Soon after we gained Independence, the Indian Standards Institution was founded in September 1947. Its Director asked me immediately to form a Sectional Committee for Documentation. In 1948, this Committee put up a proposal to the Government for the efficient organisation of documentation so as to help research (3). This provoked the Director of Archives and the President of the Historical Records Commission. They challenged the right of the Library Profession to meddle with documents which were their own exclusive concern. A note had to be sent explaining that the term 'Document' did no longer have merely the historical meaning of unpublished archives or historical documents. The term 'Document' now denotes any publication in any subject — be it Mathematics or Physics or Agriculture or Medicine or History or Economics. In fact, the note further set forth the following kinds of Documents, now recognised:—

- 1 Whole book, or whole volume of a periodical — denoted by the term 'Macro Document';
- 2 An article in a periodical or a portion of a book — denoted by the term 'Micro Document';
- 3 A standard, a specification, a patent, or any such materials — denoted by the term 'Neo-Documēt'; and
- 4 Direct record, by mechanical methods, of natural and social phenomena unmediated by the human mind — denoted by the term 'Meta-Documēt'.

112 *International Experience*

In June 1948, I went to the Hague to attend the Conference of FID (International Federation for Documentation). Le Meistre, the President of the FID, told me that some archivists had protested against the FID on its entering into the field of "documents". I said to him, "*Na Kutrachit Anidrisam Jagat* — the world is nowhere different from what it is here". On hearing about the note, prepared for India, he took my permission and had it published and circulated widely to other countries.

12 DOCUMENTATION

Documentation consists of 1 Documentation work, 2 Documentation service, and 3 Liaison work,

121 *Documentation Work*

Documentation work consists of preparing, either in anticipation or on demand, either an exhaustive or a select list of all kinds of documents — particularly nascent micro documents — on a specialised subject. The list may be either an ad-hoc one or a periodical one. It may be a local list or a national list or an international list. Such a list covering only books was known as "Bibliography" for a long time. The same term was continued to be used till about 1935. Then the term 'Documentation' was introduced to show the emphasis on nascent micro documents and on specialist readers engaged in research.

122 *Documentation Service*

Documentation service consists of,

1 Document finding, and for this purpose conducting a dialogue between the research worker, the reference librarian, and the documentation list;

2 Supply of the documents needed by the research worker; and

3 Checking up at intervals whether the research worker has got all that he needed, and whether he would like to have something more.

123 *Liaison work*

Liaison work consists of,

1 Arrangement for translation service where necessary;

2 Arrangement for supply of reprographs of documents when the research worker desires to own them; and

3 Procurement for a research worker copies or reprographs of documents not available in the library, from other libraries within the country or outside.

2 *New Development***21 SOCIAL PRESSURE**

The need for serving nascent micro documents to research workers has not been a matter of chance. It was a natural effect of newly developing social forces. The two social factors leading to this are,

1 Increase in the population pressure; and

2 Rise in the standard of life.

Population pressure has gone beyond the capacity of natural and near-natural commodities to maintain the people.

22 PHENOMENAL INCREASE IN MATERIAL WANTS

The material wants — such as, food, clothing, housing facilities, and transport facilities — have increased manifold, even in the case of persons in the lower economic strata. For example,

as a result of this social pressure, artificial building materials — such as, concrete and reinforced concrete — have to be produced and continuously improved upon. Artificial fibres have to be made to meet the clothing needs. Ever increasing artificial material, such as plastics, and sources of power, such as nuclear power, have to be invented, discovered, and continuously improved upon. Chemical fertilisers have become a necessity to increase food production. Natural grains, and similar raw materials, not directly consumable and perhaps even having some poisonous principle in them, have to be processed and made consumable. So also the means of transport and their speed have to be continuously improved upon.

23 INTENSIFICATION OF RESEARCH

The result of this is the,

- 1 Intensification of the production of natural commodities; and
- 2 Production of artificial commodities.

These have to be based on the,

3 Continuous improvement of technology; and in its turn, this has to be based on

4 Continuous research on large scale — developmental research, pragmatic research, applied research, and pure or fundamental research; and

5 These intellectual activities have ultimately to depend upon fundamental laws — called Hypotheses and Postulates in Natural Sciences and Normative Principles in Social Sciences. Such 'Fundamental Laws' are formulated at intervals by persons with considerable intuition.

3 Triangle of Forces

30 NEED FOR INTENSIVE RESEARCH

The growing social pressure, described in Sec 21, has created a mutually retro-active triangle of forces described in Sec 31 to 37. This is increasing the need for intensive library service in all countries and in all subject-fields.

31 RESEARCH PERSONNEL

The first effect of the social pressure described in Sec 21, 22, and 23, has been the Increase in the Number of Research Personnel. It is now nearly a hundred times of what it was at the beginning of the present century (8, 18). According to Academician L A Artsimovich, "All well-known Russian physicists (in 1900) could be accommodated on a single sofa, while the funds allocated for physical research were much less than those allowed for keeping the Czar's stables". It has been estimated that the number of scientific research personnel has risen in Russia from 11,600 in

1914 to 770,000 in 1967 — that is, nearly seventy-fold (10). A recent American study (13) estimated that the number of scientific research personnel has risen in China from 600,000 in 1955 to 2,400,000 in 1962. Table 1 at the end is an illustrative one.

311 *Expenditure on Research*

Another measure of the present-day intensification of research is the trend in the increase of expenditure on research (9). The annual research expenditure in USA had reached in 1964 Rs 50,000,000,000. The expected expenditure in 1970 is Rs 500,000,000,000. Even in India, the research expenditure had reached in 1968 Rs 1,000,000,000 (19). Table 2 at the end is an illustrative one.

312 *Agency Financing Research*

The governments too have now entered the field of research. They have found the necessity of setting up permanent teams of research for both defence and civil purposes. Indeed, the Government is now the largest single business enterprise in most countries. They now bear the largest percentage of the cost of research, including documentation. The shift in the proportion of the cost of research in USA is illustrated in Table 3 at the end.

313 *Industry-wise Expenditure on Research*

The proportion of the sum set apart for research by industries in the different subjects is not the same. For example, in USA it is as high as 3.34% for Instruments and as low as 0.44% for Leather products. For an illustrative table of details giving percentage of the sale proceeds set apart for research by the industries in different subjects in USA see Table 4 at the end (16).

314 *Accelerated Exploitation*

Another result of social pressure is the continuing narrowing down of the time-interval between the discovery of any idea or principle and its practical utilisation. For example, the practical utilisation of Photography took about 100 years after its invention. For Laser it was only two years. Table 5 at the end is an illustrative one.

32 PROLIFERATION IN THE UNIVERSE OF SUBJECTS

The increase in research activity brought about by social pressure, has resulted in a great proliferation in the universe of subjects. For example, in Biomedical Sciences, the number of major new ideas during 1451-1700 was 4, whereas it was 80 during 1901-1950 (1). Table 6 at the end is an illustrative one.

33 PROLIFERATION IN DOCUMENTS

About a century ago, the research output was small. About a thousand learned periodicals, floated in the course of a century, proved sufficient for the communication of the research output. The number of learned articles published in a year was of the order of 20,000 only. Today, on the other hand, planned team research and social pressure has enormously increased the quantity of research output. Today the number of learned articles published in a year is of the order of 1,200,000. About 50,000 learned periodicals in a year prove insufficient today. To take a concrete case, Bio-Medical Sciences alone have now about 10,000 periodicals and these carry about 220,000 articles (2). This down-pour of new micro documents, creates by itself, problems in storage, location, and service.

4 Loss in Research Potential

One serious social problem created by the present day rate of down-pour of micro documents is the wastage of research potential in any country and in the world at large. For example, in UK Rs 216,000,000 is the estimated value of the loss of research potential in Science in general. In USA Rs 1,870,000 is the estimated value of the loss of research potential in Electronic Translation Equipment alone. Table 7 at the end is an illustrative one (5). The world was baffled by this colossal loss in the utilisation of the scarce commodity—capacity for research.

5 Kurma-Avatara

51 TOOL OF DOCUMENTATION

Prayer went up to the Protector of the Universe: "Yugas (aeons) ago, the milky ocean was churned to get its treasures. When the churn got stuck up at the bottom of the ocean You came to rescue the situation as "Kurma-Avatara" — manifestation as tortoise. You held up the churn on your back. Today, we are in a similar predicament. We are churning the ocean of subjects to get what is necessary to maintain our teeming millions above want of every kind. Research is our churn. The amplitude of the nutation of this churn is too vast to recover what we want from the ocean of subjects. It oscillates too violently and too widely. Moreover, it now and again gets totally clogged at its bottom to allow of its being churned. Pray, Protector of the Universe, come and save us." They all heard a Voice. It carried the words of the Protector: "I am taking another Avatara to help you. I am again coming as Kurma, but not to bear all the burden Myself. I am coming to present you with the Tool of Documentation. Use it and you will save yourself. Not only it will prevent the sticking up of your churn of research at the

bottom, but will also by its delicate and differential response to the changes in the nutation of the churn, restore it to its most productive position".

52 SAVING OF RESEARCH POTENTIAL THROUGH DOCUMENTATION

It has now been realised that the loss in research potential can be eliminated considerably by providing for documentation in each subject. For example, in Lithuania Rs 1,650,000 has been the estimated value of the savings in research potential in Electronic Welding Equipment alone. In India itself, Rs 300,000 is the estimated value of saving of research potential in Machine Tool Industry alone. Table 8 at the end is an illustrative one (5).

6 Fight over the Agency for Documentation

61 RESEARCH PROFESSION AS AGENT

The episode of the fight which turned up after the help of the former Kurma-Avatara is being repeated even in the present case. The Tool of Documentation became an apple of discord. A fight began about the claimant for the Tool.

The first to grasp the Tool of Documentation were the researchers themselves. The research workers in USA started their Association of Special Libraries for this purpose, as early as 1908. These in UK started their Aslib (Association of Special Libraries and Information Bureaux) in 1925. All such National Associations of research workers federated themselves into the FID (International Federation for Documentation). They all got their finances from the industries. They were kept above want.

62 LIBRARY PROFESSION AS AGENT

It took about half a century for the Library Profession to realise their responsibility in this matter. They were all along oblivious of the crisis forming in their service to readers — particularly the specialist readers. Their claim for the Tool of Documentation was turned down by the research profession on the grounds of prior possession. Some in the research profession even ridiculed the idea of the library profession aspiring to use the Tool of Documentation. Here are two contradicting experiences.

63 A HAPPY EXPERIENCE

I shall first mention a wholesome experience. In 1950, I was touring in USA for about eight months to understand the problems of the document requirements of industrial and of research organisations. For, at that time such institutions were not functioning in India to any appreciable degree. I was fortunate to get introduced by the 91 years old John Dewey, the famous Educationist and Philosopher, to the Chrysler Motor Company,

which was near his country residence. Here I was given every facility. I could observe the whole process from the production of each of the ultimate parts of a car, to their being brought to the assembly line, each to the proper point and at the proper time, and the assembled car being taken over at the end of the assembly line and actually driven away by the pilot driver. I could also see the amount of research that went into the making and the continued improvements of each of the ultimate parts. Then I realised how much commodity production was being atomised and how much the library profession should develop its own techniques to receive, organise, and serve the micro documents generated thereby.

64 A LURID EXPERIENCE

Then came a lurid experience of the feud between the extremist researcher-documentalists and the library profession. It is this experience that has been the type. The happy Chrysler experience was an exception. I wished to study the problems in the documentation of Petroleum Technology. I asked a Teacher of Library Science to introduce me to the Documentalist of an Oil Company. He immediately took the telephone and told that Documentalist, "Professor Ranganathan is presently coming to see your Documentation service". I asked my friend, "Why did you not describe me as Librarian?" He replied with a smile, "You will know the reason very soon!" I was received by the Documentalist of the Oil Company with great respect. He showed me with pride, the long battery of his cabinets containing documentation cards. I spent sometime in turning through the cards in different cabinets. All along the researcher-documentalist was pouring his ridicule over the library profession. "How can the boys, taking their degrees in library science, do this kind of work? It is absurd. Is it not?" I was hearing all that with great patience. Unfortunately for him, I spotted out a card with a Subject Heading beginning with the letter "T" and describing the same kind of document as the one described in a far off card with a Subject Heading beginning with the letter "C". I said, "Look here Documentalist. The entries on the same subject are put under two Subject Headings. Your research workers will miss the one or the other." The researcher-documentalist chewed his finger and said, "Professor, you are right. You should be an acute Professor of Oil Technology to have detected this error! How did you detect it?" I calmly said, "By Facet Analysis". "I was never taught that by my Professor of Oil Technology. What is that Facet Analysis, Professor". When I said that it was a library technique, he asked me, "How did you come to learn it, Professor?" Then I said that I was Professor of Library Science

..... But he was, in reality, a good man. I complimented him for the excellent Subject Headings he had prepared for Oil Technology and said that I would like to have a copy of it for my own research in library science. He packed a copy of the *Subject Headings* and gave it to me, saying, "This is a Confidential House Document. Still I give it to you, as you have made me realise the potentialities of library science." This shows the essential co-operative quality in man. The feud between professional groups is only the creation of passion.

65 THE RESPONSIBILITY FOR THE TROUBLE HAD RESTED WITH THE LIBRARY PROFESSION

The library profession had been for long oblivious of the crisis brewing in the efficiency of library service for several decades. It had neglected to equip itself for the work of documentation. It has been all along finding complacency and feeling its duty fulfilled by merely serving whole books. Naturally, the research workers could not build up any confidence in the capacity of the library profession to help them. But, that confidence can be easily produced if only the library profession takes up Documentation as a natural extension of its field of service. Just one illustration. In 1947, the Secretary-General of the FID sensing the need for alliance with the library profession requested me, though only a librarian, to give him a paper on "Classification and international documentation". This paper appears to have disclosed to them the essential dependence of efficient documentation on the library profession. This led FID to invite me to its Conference at the Hague beginning on 17 June 1948. The members were all research workers turned "Specialist Librarians". I was only one of the two or three members of the library profession attending it. But, my paper, which had been already published by the FID (14), made them accept me as their equal. They arranged few meetings to be addressed by me on the techniques of Documentation — Facet Analysis, Chain Procedure, Depth Classification etc. I was then taken to the Scandinavian countries by the Specialist-librarian-delegates from the respective countries. This had also produced some effect in USA. For, in 1950 I was invited by the Special Libraries Association to take part in their Conference at the Atlantic City and also to work more intimately with some of the Chapters of that Association. Thus, there is in reality no fundamental feud. Good-will and reason triumph ultimately.

66 ECONOMICS OF THE AGENCY FOR DOCUMENTATION

There is another important social consideration in this matter of Agency for Documentation. To pull out a research worker

from his laboratory and put him into the library to do documentation is a waste. Not only his true capacity is wasted, but also the design and the continuous improvement of the Tool of Documentation — the Techniques of Documentation — is best done by the library profession. This global economy requires to make the library profession the Agency for Documentation. We trust that this will soon be realised the world over.

7 Technique for Documentation

71 BELGIUM'S CONTRIBUTION

It was two Belgians — a Lawyer and a Parliamentarian — that first sensed the need for a sharp scheme for classification as a Tool for Documentation. This they realised in 1895. For this purpose, they took up the then prevalent DC (Decimal Classification) designed in USA in 1876 for book classification. Finding it to be inadequate for article classification, they venerated it with Time and Space Facets and the so called Analytical Divisions. This venerated DC was called UDC (Universal Decimal Classification). The FID took over the responsibility to improve UDC from time to time. In 1931, it was called International Institute of Documentation, and was situated in Brussels. In 1937 it was moved to the Hague and renamed International Federation for Documentation. The improvement of UDC was left in the hands of not classificationists but in the hands of research workers in the respective subjects. This naturally proved amateurish. For, they could not do their work on the basis of a Dynamic Theory of Classification.

72 WISH OF DONKER DUYVIS

Donker Duyvis, the Secretary-General of the FID, was the one man who had dedicated himself for the development of UDC, all through his life.

He was one of the first to realise the potentiality of depth classification. In 1958 (7), he wrote "The trend of development of 'depth classification' as our friend Ranganathan has called it, is a further evolution of multidimensional classification. Colon Classification and UDC are to my knowledge the two universal classifications in existence which show the multidimensional approach."

He further elaborated the relation between CC and UDC in the following words (6):—

"I foresee that CC (Colon Classification designed and being kept up in India since 1925) and UDC will last long and I venture to say that they merit not only to last long but attempts should be made to *combine* their approaches in the long run. Perhaps, the CC is more of consequence in its philosophical approach.

Perhaps the strong stress on the personality approach gives also a physical feature, even a human feature — if I am allowed to say so; and if I may speak of the "Character" of a classification, the CC shows something of the noble character of its creator who sees and respects the psychological factors in the analysis of the world's phenomena. Most fundamental for both CC and UDC is that both are Universal in a true sense; every subdivision may be co-ordinated with any other; both are multi-dimensional. Should indeed the twain from East and West never meet? From Ranganathan, the five facets are far more than basic features of library classification; they surpass the barriers of library science and are fundamental in the broadest way for the phenomenology of the mind. I see the possibility of finding a closer approach between CC and UDC, if we find the time to do so by common search. Altogether I believe the distance of these two classifications, in abstract, is not so far and even less than between UDC and DC. We have in a spiritual sense a stronger relation between CC and UDC, a stronger relation because Ranganathan has been willing to act as leader for the theoretical study of classification in the FID, I know that the task to bring together the two main universal multi-dimensional and dynamic classification — CC and UDC — is almost super-human and I must confess to feel myself unable, even to fulfill it in part. But if we can see one in whom we have confidence that he will make at least a serious attempt to unify, I think it is our *friend from the East*."

73 NOT AN IMPOSSIBLE TASK

The merging of CC and UDC, so as to evolve a Dynamic Scheme for Classification, with an inner mechanism to follow a Dynamic Theory of Classification, itself keeping pace with the turbulent Universe of Subjects, is not altogether impossible. This will achieve the unification of CC and UDC for which Donker Duyvis longed in his last days. It is true that Donker Duyvis is no longer with us. It is equally true that I may not be with you for very long. But, you need not despair. The wish of Donker Duyvis can be realised if,

- 1 The UDC authorities would shatter away their encrustation of prestige;

- 2 The work can be entrusted to the classificationist section of the library profession;

- 3 The library profession would unreservedly take the help of specialists to inform themselves from time to time the happenings and the trend in the wave-front of the diverse subjects and adjust the design of depth classification in a helpful way;

- 4 The Indian library profession can escape from the grip of the Pre-Gandhian despondence;

5 It can boldly give up the habit of the Pre-Independence-period, of rejecting whatever is of Indian origin and of accepting only whatever comes on board the ship, however outmoded and stale it has become; and

6 It can develop devotion to work, industry, and persistent pursuit of library science.

This is a challenge to the new generation of India's Librarians to step into the field with the confidence worthy of being the successors of our strong-willed Mahatmaji.

At the same time you should not give up the traditional tolerance of Mother India. You should cooperate with all the countries in this common task of evolving a Freely Faceted Scheme for Classification as a necessary part of the Tool for Documentation put into the hands of humanity by the Kurma-Avatar of the Protector of the Universe.

8 India's Position of Vantage To-Day

In this matter, India has an adventitious advantage. She had been in her long rest-period, when modern library service, including documentation service, took shape. Therefore, there is no obstruction from bad tradition to prevent her librarians to develop library science and library practice with an open and un-prejudiced mind. She has a clean slate to write on. To some extent, she had already made a beginning of it. The Five Laws of Library Science, formulated in India, has unified all forms of service of all kinds of documents to readers of all kinds — generalists or specialists. It can help the development of the unified library profession. I take it that it was but a passing freak that while still within the grips of the Pre-Gandhian imitative life, the librarians of India formed two Library Associations in the country. As we have seen, this had historic foundations in the West. We have nothing like that in India. The research profession of India is not competing with the library profession to grasp the Tool for Documentation. This is left entirely in the hands of the library profession. Therefore, it is virtually the same persons that have to be members of both the Associations. It is the same persons who have to bear the burden of the two Associations alternately. No doubt, the two Associations have been giving till now two annual occasions for a gathering as in "Kumbha Mela" (Pilgrims Fare) at public cost. I appeal to the two Associations — I belong to both — to merge themselves into one active vigorous Association, and to put in hard work to make themselves useful to the profession and to the country at large. The preparation for the Annual Conference should be an all-year one. The papers should not be merely rehashes or a reproduction of something novel, done in some other country

without our having experienced it at all. I pray for this to be realised.

8Z A Peep into the Future of India

90 FIVE ORGANISATIONS

There are five organisations in India to give the people true library service — be it for generalist readers or for specialist readers.

91 NATIONAL DOCUMENTATION CENTRE

911 *Foundation of Insdoc*

The Insdoc (Indian National Scientific Documentation Centre) was the first organisation to be established. The proposal for the establishment of a National Documentation Centre in India, made in 1948, and mentioned in Sec 111, became a reality in 1952. The Insdoc was established in that year with the aid of Unesco. Three persons were responsible for this. Dr Santi Swarup Bhatnagar, Dr K S Krishnan, and myself. Its development was left to the care of an Advisory Committee made of these three persons and a few others. In 1954, it began to send out a fortnightly appetiser — the *Insdoc list* — carrying a classified list of ascent micro documents to the tables of every research organisation, simultaneously with or even before the arrival of the periodicals themselves.

912 *Functions of Insdoc*

Apart from this essential function of publishing a periodical national documentation list, it should also supplement on demand the documentation services being done by local service libraries (See Sec 942). Further it should spot out fresh difficulties met with during its documentation work and pass them on to DRTC for the removal of such difficulties by the necessary research in documentation (See Sec 932). The Insdoc should also provide reprographs of documents on demand.

913 *Social Science Documentation Centre*

The Documentation Branch of the Indian Council of Social Science Research has been formed this year. Its functions should be similar to those of Insdoc.

92 MERGED IASLIC AND ILA

921 *Foundation of Iaslic*

The Iaslic was the second organisation to be established for promotion of documentation. It came into existence in 1956. It has been attempting to do many varieties of things during the last few years.

922 *Functions of Iaslic*

But the true function of the merged Iaslic and ILA should be to make country-wide public contact. It should impress upon the industrial and research organisations and the libraries of the country, on the necessity for Documentation for the proper development of our country. One of the forms of public contact should be splashy public functions arranged in different parts of the country from time to time.

923 *Additional Functions*

The Iaslic should also promote the acceptance of the National Documentation Services being given by the Insdoc. It should further make the industrial and research libraries know about the consultant service they can take from DRTC (*See* Sec 933). It should further persuade the public library authorities of the country to open specialist branch libraries in the areas where small industries are concentrated (*See* Sec 943).

93 DRTC**931 *Foundation of DRTC***

The DRTC (Documentation Research and Training Centre) was the third organisation to be formed to promote documentation (4). It was founded in 1962. Its foundation was due to the vision of two statesmen — P C Mahalanobis, the expert in perspective planning, and the late Prime Minister Jawaharlal Nehru, who laid the path for the progress of free India. The DRTC is housed in Bangalore.

932 *Functions of DRTC*

Its main function is research in library science, with emphasis on documentation — needed for the service of nascent micro documents to specialist readers. In its applied research it should pay immediate special attention to the problems posed by the Insdoc (*See* Sec 912). Its devoted team have already produced about 300 research papers of top-level quality and depth versions of CC for about 100 industrial subjects.

It is almost certain that the force of the present revival of India will in due course enthuse and make the departments of Library Science of some of the Universities taking up research in the subject using the University Libraries as laboratories and observatories, so to speak. It is my earnest hope that the Department of Library Science and the Library of the University will work hand in hand and in perfect harmony in the pursuit of research.

DRTC holds an annual seminar of documentalists, for exchange of new thought in documentation. It also holds ad-hoc

seminars on subjects such as Classification, Cataloguing, Reference Service, and Teaching of Library Science. In 1964, it hit upon a new methodology for the production on demand — almost at a manufacturing speed — of depth versions of CC for diverse special subjects. This is availed of even by other countries. Here are a few instances:—

1 In September 1964, I was presiding over the Second International Study Conference on Classification Research, at Elsinore. Two American delegates told me that the down pour of documents on Nuclear Medicine was overpowering and asked if DRTC could be of help in the matter. As India could not have such documents, they offered to send to DRTC reprographs of an assortment of the latest documents on the subject. I wrote to Prof A Neelamegha about this and asked him to start work immediately. He promptly replied that there was no need to get reprographs as there was a good collection of documents on the subject in the Indian Institute of Science Library, though they were not being put into active use. By the time I returned to Bangalore, he was ready with a draft schedule for the subject. We finalised it in a few days, published it in our quarterly *Library science* and sent reprints to the party in USA (17).

2 A librarian of USA spent six weeks in 1966 in DRTC and built up a depth schedule of CC on Motor Vehicles (12).

3 The Chairman of the Classification Research Committee of the FID, wrote in 1967, that the DRTC was not only an Indian or an Asian Centre but a world centre in documentation research (11).

933 *Additional Functions of DRTC*

As research cannot be done effectively without contact with young growing minds, DRTC is also running a Training Centre for documentalists. Here each year, it trains a few persons for advanced documentation service, and also a few others for research in documentation — Developmental or Applied or Fundamental, according to the aptitude of the student. When its trained man-power increases sufficiently, it hopes to send out documentalists to give consultant service to the documentation centres in the country. When the DRTC is ready for this service it should inform the Iaslic about this, so that the latter can do the necessary public relation work in this matter (See Sec 922).

94 LOCAL DOCUMENTATION CENTRE

941 *Foundation of Local Documentation Centre*

The various major industrial houses and the research organisations should form their own service libraries for Documentation. This is yet to happen. For they are slow to realise

the importance of the service they can get out of them. The value of Research and Documentation is illustrated in Tables 4, 7, and 8. The Iaslic has a great task to perform in bringing about the foundation of such local service centres (See Sec 922).

942 *Function of Local Documentation Centres*

Any service to reader — specialist or generalist — will have to be ultimately on person to person basis — on individual reference librarian to individual reader basis. This is possible only in a Local Service Library. The librarians, and the reference librarians — that is, documentalists — of a Local Service Library should not imagine that they have done their job by merely collecting and organising documents. They should do aggressive reference service to their clientele. They should frequently visit the laboratories, the chambers of the research workers, and the different shops in a factory, to acquaint themselves with the problems engaging attention. In the light of the information thus gathered, they should mobilise the documents in their custody — pinpointedly and exhaustively — and place them at the service of the concerned workers. If the demand for documentation service or documentation list is beyond the capacity of their own collection, they should immediately take the help of the Indsoc (See Sec 912). If they come across any difficulty in the organisation of any new documents coming into their collection, they should take the help of DRTC (See Sec 932).

943 *Breaking of the Barrier between Specialist and Generalist Libraries*

The boundary line between a specialist library and a generalist library was never sharp. For the last few years, the boundary line is becoming increasingly broader. The functions of the two kinds of libraries have begun to overlap considerably. This is happening in a pronounced way in University Libraries. In 1956, I saw in UK the beginning of the breakdown of the boundary line even in public libraries. Several of them were opening Departments for some documentation service to the specialists engaged in local industries. I have advised the City Librarian of Bangalore, to make the branch library in the area of small scale industrial centre in Rajaji Nagar, a specialist-library-in-little. He has seen the wisdom of it. Other cities too should follow this example. There is demand from the small scale industrial centres themselves. We have already experienced this demand both from Bangalore and from Hyderabad.

95 HOLISM

These four organisations for library service should work

in unison as four functional organs of one and the same organism. No organ should take up the function of another. On the other hand, each should do its own function in the best way possible and trust that the others will do similarly. This is the way of a healthy growing living organism. This is the way to attain Holism, to use the profound term of General Smuts. A prize that India should have for its having recovered so late from its long rest-period, is such a Holistic organisation of the four functional organs for documentation mentioned in Sec 91 to 94.

96 Bibliographical References

- Note.*— 1 The following is the list of the documents used.
 2 Col 1 gives the serial number.
 3 Col 2 gives the number of the Section in the text containing the reference.

- 1 Sec 32 BAVADEKAR (P N) and others. Rate of development of the universe of subjects and the design of schemes for classification. Sec 5. (Annual seminar, (DRTC). 5; 1967; Paper A).
- 2 Sec 33 BRODMAN (Estelle) and TAINÉ (Seymour I). Current medical literature: A quantitative survey of articles and journals. (*In* Scientific Information (International Conference on —) (Washington) (1958). Proceedings. 1959. P 435-47).
- 3 Sec 111 *Documentation (National — Committee)*. (Abgila. 1; 1949-50; B14 and B47).
- 4 Sec 931 *Documentation Research and Training (— Centre)*. 1970. [Mimeographed].
- 5 Sec 4 DOCUMENTATION RESEARCH AND TRAINING (— Centre). It pays to be informed. 1969. [Mimeographed].
- 6 Sec 72 DUYVIS (Donker). Jubilee of the creator of Colon Classification. (*In* Kaula (P N), Ed. Library science today. 1965. Chap B1).
- 7 Sec 72 —. Specification of relationship in multi dimensional classification. (Policy of revision of the Universal Decimal Classification. 6) (Rev doc. 25; 1958; 82-4).
- 8 Sec 31 INDIA, EDUCATION (— Commission) (1964). Report: Education and national development, 1966. P 408.

- 9 Sec 311 LAYTON (C). European advanced technology: Programme for instruction. 1969. P 275.
- 10 Sec 31 MIKHAILOV (A I) and others. Informatics: Its scope and methods. P 8-9. (*In* Mikhailov (A I) and others, *Ed.* On theoretical problems of informatics. 1949. (FID 415). P 7-24).
- 11 Sec 932 MOLGAARD'H (R). Editorial [to FID/CR Report (3) Series 5 and 6]. 1967.
- 12 Sec 932 NEELAMEGHAN (A) GOPINATH (M A) and DENTON (1) (P H). Motor vehicle production: Depth Classification: A demonstration (Lib sc. 4; 1967; Paper H).
- 13 Sec 31 OLDHAM (C H G). Science in China. (*Science today.* 3,9; 1969, May; 44).
- 14 Sec 65 RANGANATHAN (S R). Classification and international documentation. 1948. (FID pub. 227). *Also* (Rev doc. 14; 1947; 154-77).
- 15 Sec 0 —. Documentation in the spiral of library service: Presidential address to the Iaslic Conference (5) (1963) (Poona). (*Iaslic bull.* 8; 1963; 179-210).
- 16 Sec 313 —. Why of documentation. Sec 15. (*In* Ranganathan (S R), *Ed.* Documentation and its facets. 1963. Chap B6).
- 17 Sec 932 — NEELAMEGHAN (A) and GOPINATH (M A). (2) Medical radiology: Depth classification. (Lib sc. 2; 1965; Paper G).
- 18 Sec 31 RANGARAO (B V). Scientific research in India: An analysis of publications. (*J scient ind res.* 26; 1967; 174).
- 19 Sec 311 SCIENTIFIC AND INDUSTRIAL RESEARCH (Council of —). Achievement of national laboratories and research institutions. 1970. P 4.

97 Tables

Table 1 : Estimated Research Man-Power in 1962
(See Sec 31 of the Text)

Country	Research Personnel	
	(1962)	(1970)
China	2,400,000	
United States	1,160,000	4,000,000
USSR (1967)	770,000	
United Kingdom	211,000	
Germany	142,000	
Japan (1966)	129,000	
France	111,000	
India	80,000	120,000
Netherlands	33,000	
Belgium	22,000	

Table 2 : Expenditure on Research in USA
(See Sec 311 of the Text)

<i>Expenditure in Millions of Rupees in the Year</i>				
1930	1947	1953	1964	1970
500	2,000	6,000	50,000	500,000

Table 3 : Shift in the Agency Financing Research in USA
(See Sec 312 of the Text)

Agency	<i>Before World War II</i>	In 1953	In 1964
University	5%	5%	4%
Industries	60%	40%	32%
Government	35%	55%	64%

Table 4 : Percentage of Sale Proceeds Set apart for Research by Industries in USA
(See Sec 313 of the Text)

<i>S N</i>	<i>Subject</i>	<i>Percentage of sale proceeds set apart for research</i>
1	Instruments and precision products	3.34
2	Electrical machinery and equipment	2.80
3	Printing trade	2.55
4	Miscellaneous	2.25
5	Transport equipment	2.04
6	Chemical products	1.83
7	Non-electrical machinery	1.67
8	Apparel	1.65
9	Fabricated metal products	1.64
10	Rubber products	1.36
11	Food and beverages	1.15
12	Stone and Ceramic products	1.11
13	Textile products	0.95
14	Petroleum and coal products	0.74
15	Paper and allied products	0.72
16	Primary metal industry	0.64
17	Lumber and wood products	0.57
18	Furniture and fittings	0.50
19	Leather and its products	0.44

Table 5 : Acceleration of Exploitation of New Ideas
(See Sec 314 of the Text)

<i>S N</i>	<i>Subject</i>	<i>Year of</i>		<i>N of years</i>
		<i>Discovery of Principle</i>	<i>Practical Application</i>	
1	Photography	1727	1839	112
2	Telephone	1823	1876	53
3	Atomic power release	1932	1945	13
4	Transistor	1940	1948	8
5	Laser	1958	1960	2

Table 6 : Major New Ideas During Different Periods
(See Sec 32 of the Text)

Colon Class Number	Main Subject	Number of major new ideas and subjects created during the period		
		1451-1700	1701-1900	1901-1950
B	Mathematics	9	24	21
C	Physics	3	21	68
D	Engineering	1	23	46
E	Chemistry	0	36	80
F	Technology	0	21	70
G	Biology	2	4	8
H	Geology	1	16	8
I	Botany	1	7	4
J	Agriculture	0	2	2
K	Zoology	0	4	4
L	Medicine	4	21	80
Total		21	180	391

Table 7 : Loss in Research Potential
(See Sec 4 of the Text)

SN	Loss	Field of Research	Country
1	Rs 216,000,000	Science in general	UK
2	Rs 15,000,000	Electronics	USA
3	Rs 18,700,000	Electronic translation equipment	USA

Table 8 : Savings in Research Potential through Documentation
(See Sec 52 of the Text)

SN	Saving	Field of Research	Country
1	Rs 1,650,000	Electronic welding equipment	Lithuania
2	Rs 8,000 per annum	Handicrafts	Sweden
3	Rs 100,000	Clothing	Denmark
4	Rs 300,000	Machine tool	India
5	500 man-hours of research personnel	Research and development laboratory	USA

98 INDEX

Note.— Index number is Section Number

Abbreviations used:—

def = Definition

irt = In relation to

qirt = Quoted in relation to

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