and which would alert budding young scientists to the problems involved in storing their own and other's scientific contributions so that they may not go unused or unconsidered.

Finally, emphasis should be placed on the creative aspects of documentation chemistry. The storage and retrieval of chemical research data is a means to the end of ensuring that as much pertinent knowledge and experience as is possible be considered by both those planning new research and those trying to capitalize upon the knowledge presently available. The documentation chemist often can aid the research chemist materially in this planning phase by pointing out unexpected extensions, or new research parameters, based upon consideration of the peripheral data usually accompanying specific pertinent data. This advantage of the generic approach to information retrieval gives the documentation chemist the opportunity to make suggestions not considered prior to his use of the storage-retrieval system. This enables the documentation chemist to have an outlet for his creative abilities.

REFERENCES

(1) Presented at the 4th Delaware Valley Regional Meeting, American Chemical Society, Philadelphia, Pa., Jan. 25, 1962.
(2) W. J. Wiswesser "A Line-Formula Chemical Notation," Thomas Y. Crowell Co., New York, N. Y., 1954.
(3) G. M. Dyson, "A New Notation and Enumeration System for Organic Compounds," Longmans Green & Co., New York, N. Y., 1949 and 1961.
(4) "A Method of Coding Chemicals for Correlation and Classification," National Research Council, Washington, D. C., 1950.
(5) R. S. Casey & J. W. Perry, Editors, "Punched Cards; Their Applications to Science and Industry," Reinhold Publishing Corp., New York, N. Y., 1951.
(6) A. Opler, *Chem. and Eng. News*, **35**(33), 92, (Aug. 19, 1957).
(7) W. H. Waldo, R. S. Gordon, and J. D. Porter, *American Documentation*. **9**, 28–31 (1958).
(8) G. M. Dyson & E. F. Riley, *Chem. and Eng. News*, **39**(47) 74 (Nov. 20, 1961).
(9) E. B. Edge, N. G. Fisher & L. A. Bannister, *American Documentation*. 8, 275 (1957).

Panel Discussion on Education for the Literature Chemist*

By HERMAN SKOLNIK
Research Center, Hercules Powder Company, Wilmington, Delaware
Received January 24, 1962

The purpose of this panel discussion is to explore the role that colleges and universities might play in the further growth of chemical documentation as a discipline of chemistry.

As of now, there is no bridge between chemical documentation and universities. Both the discipline and the professional literature chemist have arisen in response to the needs of the chemical industry. Although chemical documentation is flourishing in the industrial environment, the literature chemist is not a direct product of the universities, and research in chemical documentation is practically non-existent in universities. Even more serious is the fact that many chemistry teachers are not aware of chemical documentation as a discipline of chemistry.

In the light of the picture I have just drawn, why should we want to involve colleges and universities with chemical documentation? I think that the primary reason is that no discipline of science can truly exist without roots in our educational structure: We need these roots to attract able young scientists to chemical documentation. We need these roots to develop procedures, knowledge, and principles of documentation through academic research.

On the other hand, a chemistry curriculum devoid of chemical documentation cannot prepare students for a science undergoing constant change. Science and technology are not tied to the knowledge and mode of thought acquired in four years of college and three years in graduate school. For in these seven years, at the present rate of growth of the chemical literature, the total chemical knowledge will have doubled, new disciplines of chemistry will have arisen, and some older ones will have died.

I do not advocate that we build a large bridge between chemical documentation and the universities. I do not think that there is a need for an undergraduate curriculum in chemical documentation. A student entering college and for most of his collegiate life has only a vague knowledge of the relationship between his chosen profession and the world at large. Specialization too early handicaps a student in his professional life. The greatest disservice to chemical documentation, in my opinion, would be the training of literature chemists before they become the best possible chemists they are capable of being. No curriculum in chemistry should have as its objective the teaching of crafts and end-use disciplines.

The chemistry curriculum should not distinguish the potential literature chemist from other potential chemists. Chemical documentation should be a part of the curriculum for all chemistry majors, not necessarily as a special course, but as part of every course in chemistry. Chemical documentation is primarily a process of asking questions and answering them. This, in essence, is chemistry.

The potential literature chemist can be distinguished from other potential chemists by certain characteristics. He usually has superior talents and strong interests in skills such as writing, language, law, mathematics, philosophy, history, or even literature. He likes to rearrange data and organize them in new arrays. He likes to handle more data than he could possibly obtain himself. He likes being a perennial student of chemistry. These characteristics do not make him a lesser chemist. They merely make him a different kind of chemist.

There are many opportunities for literature chemists in the chemical industry. The symposium on the literature chemist in the chemical industry has delineated some of these opportunities. Professors of chemistry, if aware of chemical documentation as a discipline of chemistry, can lead potential literature chemists over the bridge to an exciting and important professional career.

* Presented at the Fourth Delaware Valley Regional Meeting, American Chemical Society, January 25, 1962, Philadelphia, Penna.