entists looking from one field into another. Furthermore, these borders are continually shifting. One could argue with more assurance and justification that uniformity and consistency are the very qualities that are most lacking in documentation throughout science and are of very high importance. Finally, documentation seldom can deal only with quite contemporary information. The documentalist must dig out past—sometimes long past—knowledge, and must also in some degree prepare his system for future scientific development.

The authors "imagine" that articles in scientific journals will be accompanied by indexing terms: which is a long-standing idea already functional in some sciences; and if authors are themselves to assist in assignment of indexing terms, which is also no new idea, very well considered hierarchic thesauruses—which must of course be open-ended to permit introducton of new index terms—will be essential to authors.

Physicists are already concerned with physics. What we require are physicists who are willing to concern themselves with the theory of documentation and not merely with its practice in some quite limited form. With all due respect for the member societies of the American Institute of Physics, we cannot at present merely hope to appoint such people because today we can identify all too few, and even if some very able physicist-documentalists are pointed out to other physicists, few are able properly to evaluate their achievements.

There is of course another aspect of physics documentation that it would be unscholarly although perhaps gentlemanly to ignore in the present discussions. The publication program of the American Institute of Physics is unsurpassed throughout the world of science. Outside of the publication program, the Institute's activities in documentation have not been notable, and participation of the physics community in documentation has not been adequately sought and on occasion has been spurned. These chickens are now at roost. A serious project in classification in physics has just been initiated within the Institute. It deserves and greatly needs the support and the participation of physicists willing to concern themselves with documentation principles. There is a serious project in progress, under excellent leadership, for improvement of *Physics Abstracts*. This too would greatly profit from participation of physicists who are also students of documentation theory.

As physicists we can only commend the authors of the preceeding proposal for emphasizing the lagging nature of documentation in physics. I argue chiefly with the casual attitude displayed toward documentation as a scientific discipline in its own right, and against the solution immediately proposed: that physicists can be appointed by societies, effectively to study and hopefully to solve our information problems.

Should we not rather proceed on another tack? Other scientific societies have divisions, composed of voluntary members, concerned with information and documentation within their sciences. Is it not time for physicists interested in documentation to organize a Division for Documentation in the American Physical Society? Members of such a Division would be required to be members of the APS, and officers would have to be Fellows. The affairs of the division would thus be in the hands of physicists. *Of course* knowledge of physics is essential: let us not argue the obvious; I maintain only that for physics documentation it is not enough.

Information science includes profound and fascinating problems. Physicists interested in or even unwillingly driven toward physics documentation should know of them. Classification and indexing, and computerized documentation, are not at all trivial matters. Let us approach them, as we do physics, with curiosity and a willingness to learn something.

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5. AN ACTION PLAN FOR INDEXING

To supplement the considerations in the two preceding letters, I should like to point out that the AIP Documentation Research Project benefits greatly from the advice of its advisory committee, composed mostly of working physicists who have some interest in documentation problems. Its members are Paul Camp, chairman, R. T. Beyer, F. G. Brickwedde, M. M. Kessler, Gilbert King, J. B. H. Kuper, Jerry B. Marion, K. G. McKay and S. Pasternack. A nuclear physicist has been a regular

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Common Mode Rejection:	120 db from dc to 60 cps, 40v p-p tolerance.
Output Circuit:	±10 volts across 100 ohms and 0.2 ohms max. output impedance at dc.
Drift:	±3 μv referred to input, ±0.2 mv referred to output.
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consultant for several years and a consulting chemical physicist was added to the staff last year.

The Documentation Research Project, supported by the National Science Foundation, has embarked on a plan for indexing physics research papers that should result in the improvement of the many reference retrieval tools for physicists: subject indexes to the journals that they read, abstract journals that they search, new current awareness tools, mechanized information centers, and even the new SDI systems (Selective Dissemination of Information). The plan has been evolving for some time. The 1962 survey of physicists to acquire data needed to develop a reference retrieval system (PHYSICS TODAY, April 1962, p 52) provided the basic information for its development. Experiments with aid-to-indexing forms (PHYSICS TODAY, February 1965, p 76) were another part of the overall plan. A US-UK *Science Abstracts* working party coördinates the efforts in the United States and Great Britain. The total information system, of which this project is a part, is described in the preceding article by Williams, Hutchisson and Wolfe. Thanks to the coöperative effort of physicists, journal editors, indexers, computer specialists, and documentalists, we are well along toward meeting the objectives stated below.

Objectives of the AIP-DRP index project

1. *Multicoördinate index vocabulary* for various fields of physics designed for mechanized retrieval and mechanized production of indexes.

2. *Improved indexing* of papers *at time of publication* to provide quicker access to content of papers by way of various abstract-journal indexes, information and data centers, and mechanized retrieval systems.

3. *Combined and compatible vocabulary* of categories and index headings for analytic subject indexes in AIP journals and for *Physics Abstracts* and its indexes.

4. *Author assistance* in analysis of papers for indexing in journal and abstract journal indexes.

5. *Centralized index production* at AIP for volume and cumulative journal indexes, for both author and subject indexes, for all AIP journals (including translation journals).

6. *Common style* of entry for each article, letter, and abstract in author and subject indexes.

It appears essential to undertake this work in units that correspond to the various major fields of physics. Dividing physics into the most appropriate categories is a problem in itself and we need to consult with physicists about it. This is one of the objectives of our current study of *Physics Abstracts* and *Current Papers in Physics*. Without waiting for a best answer, indexing studies are in progress in the following fields:

1. *Nuclear physics.* Continued effort at Lawrence Radiation Laboratory (Livermore) and USAEC/DTIE, Oak Ridge, and UKAEA (Harwell) to develop multicoördinate indexes, review and revise existing indexing vocabulary used in AIP, AEC, EURATOM, and *Physics Abstracts* systems. Plans are to expand the effort with assistance from the NAS-NRC Nuclear Science Subcommittee on Techniques for the Distribution of Scientific Information.

2. *Chemical physics.* Continued effort at AIP-DRP and Columbia University under the direction of Dr. Rita G. Lerner to improve subject indexes in the *Journal of Chemical Physics* and build a multicoördinate index for chemical physics. Review and revision of the *Physics Abstracts* index in this area is also planned.

3. *Acoustics.* Continued effort of the JASA Editorial Committee to improve the journal index and develop new index vocabulary for this area.

4. *Solid-state physics.* Expanded effort to review and revise existing indexes under the direction of AIP journal editors, with the coöperation of physicists in the APS Solid-State Division.

5. *Geophysics, plasma physics, etc.* Review and revision by individual coöperating physicists of index headings used in *Physics Abstracts.*

6. *Optics, mathematical physics, instrumentation, etc.* Assistance from editors and authors of recent journal papers by way of the aid-to-indexing forms to improve index vocabulary.

7. *Overall index vocabulary control.* A subcommittee of the AIP Publication Board has been appointed to effect greater uniformity in AIP journal indexes and to study index headings used in *Physics Abstracts.*

8. *Interface problems* with the information systems designed for other disciplines. By coöperating with the Atomic Energy Commission, Engineers Joint Council, American Chemical Society, American Society for Metals, Bell Telephone Laboratories, Institution of Electrical Engineers and others in their thesaurus revision and other efforts, AIP hopes to achieve greater compatibility among physics, chemistry and engineering information systems. The plans for this coöperative effort are only in the beginning stage at this time.

As these projects advance, we intend to keep the physics community informed so that everyone who has a contribution to make will be encouraged to make it.

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American Institute of Physics