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Do not make the mistake of thinking your single, occasional use of the company Xerox machine is always trivial. Sometimes it is, and sometimes it comes under fair use. But if you work for a large chemical, petroleum, or pharmaceutical company, for example, your trip to the photocopy machine is being repeated elsewhere in your company by others like you, and, as Congress said,² these so-called trivial abuses, in the aggregate, can deal a mortal blow to an important journal serving a narrow, specialized subset of a discipline.

Of the thousands of journals being published today, many number their subscribers in the hundreds and not in the thousands. It does not require many photocopies to put such journals out of business. That ultimate result runs contrary to your best interests. Taking advantage of the publisher will reduce your opportunities for places to publish. If you or your company or school library are making photocopies of copyright material, the use should be reported conscientiously through the Copyright Clearance Center (CCC) so that payment can be made in support of the publication. The code appearing at the bottom of the first page of most articles in ACS journals announces the fee to be paid through the CCC. It is not designed to delay or restrict copying. It provides instant, on-the-spot permission to copy, provided the copying is paid for.

You are the authors. You are the readers. You are the users. These are your publications, and you have a vested interest in their health. Protect them by using your influence

inside your companies. Express your views to the librarians and the management so that they understand you and your colleagues need to ensure the system. Urge your libraries or other photocopying facilities to secure licenses or permission to copy where necessary or else to register as users of the CCC. If you teach, please do not order multiple copies of book chapters or periodical articles without making sure your fellow authors and their publishers are compensated.

If you are an author, think about how you feel when cheated out of a royalty. If you publish in highly specialized, state-of-the-art, advanced journals, think about how you feel when such journals fold. Every two years an estimated 8000 journals cease to exist.³ As science expands, the exchange of information about discoveries must keep pace. The charge of "proliferation of journals" is misleading in implying that the rate of growth is excessive. It is science which is expanding and the need for documentation and dissemination of information is accelerating to keep pace.

All who depend upon the system of exchanging information through publishing must honor that system by ensuring that photocopying in the library or academic institution is paid for by license or through the CCC. Do not stop copying. Do try to provide your share of the sustenance needed to maintain the goose that lays that golden egg. If not, all that will remain of the egg will be the odor of hydrogen sulfide.

REFERENCES AND NOTES

- (1) "Copyright Law Revision"; Study 33: Studies Prepared for the Subcommittee on Patents, Trademarks and Copyrights of the Committee on the Judiciary, United States Senate; Washington, DC; U.S. Government Printing Office: Washington, DC, 1961; p 35.
- (2) "Copyright Law Revision"; House Report No. 83; U.S. Government Printing Office: Washington, DC, 1967; pp 35-6.
- (3) "Ulrich's International Periodicals Directory", 15th ed.; R. R. Bowker Co.: New York; 1973-1974; 16th ed., 1975-1976.

Why Should Chemists Care about Copyright?†

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Chemists and chemical engineers have been largely unconcerned about copyright, as such, but as authors of papers and users of information they very much want to be able to publish in and use high-quality publications, and they also want them to be readily available in libraries and as quickly obtainable photocopies. They do not readily relate rising publication costs and rigid library budgets to their own publication requirements nor photocopying ethics to publication continuity. If chemists and chemical engineers really want quality publishing, they must assume some responsibility for adequate funding of both quality publications and library programs that use them.

CREDITABLE PUBLISHING

As chemists or chemical engineers—as practitioners of science or engineering—we rarely feel any instinctive involvement with either copyright protection or related problems when we are involved in communicating, except, perhaps, when we are writing books and are concerned with royalties. As scientists or engineers, our chief concern in having our findings published is to add them *meaningfully* to the general store of scientific or engineering knowledge, preferably in such a way

as to be known *creditably* as the source of what we report. (Hereafter, whenever I refer to "chemists" or "scientists" I shall also mean "and engineers".)

Now, what is really involved in "adding our findings *meaningfully* to the general store of scientific knowledge"? Until the advent of electronic publishing, this has usually meant having our papers published in the most reputable journals that specialize in our fields—where there is a choice, in the journals that reach the largest audiences of our peers. We know that this usually means going through the gadfly agonies of peer review, but most of us ultimately agree that this is beneficial to the overall quality of our papers—to putting our best foot forward.

† Presented before the Divisions of Chemical Information and Chemical Education, Symposium on "The Copyright Law", 182nd National Meeting of the American Chemical Society, New York, Aug 27, 1981.

In regard to the phrase "*creditably* to us", we have expected the journals involved to attract and publish many other good papers in our fields in order to maintain or improve their reputations, and—without thinking of this as marketing—we have also wanted them to be readily available in all of the good libraries and through the most used photocopy services. We also have expected quality layout and printing, although we are already beginning to learn to live without certain niceties such as right-hand justification of lines. All of this preferably at little or no cost to us: many of us do not pay "page charges", much less "support our local libraries".

ALERTING AND SEARCHING

The second of our involvements with publications, as scientists, is in using them for current awareness and, later, when we need general or specific information. Here, we "want what we want when we want it" (to paraphrase an old song), easily and quickly identifiable and available, well written, and attractively presented. And, although we rarely enter our libraries (because we expect most information to be delivered to our desks), we are instinctively sympathetic to the outcries of certain librarians against the rising costs of subscriptions without particular regard as to whether such increases are necessary but also without much thought about better funding of our libraries. "Just send me a photocopy: why should anyone really care?"

In regard to photocopies, of course, the use of single copies has certainly become an important part of our way of life. We have long been used to distributing and requesting reprints, but many of us now feel that we can no longer wait for that leisurely process, or we need documents for which reprints are not available or are no longer so. The demand for *quickly* available photocopies (I do not say *inexpensively* available ones) has brought about increased "interlibrary loans", "library resource sharing", "library networking", "single-copy republishing", or whatever you want to call this—better service to users and a subscription-budget help to some hard-pressed libraries but an increasing problem to publishers unless they receive revenues from other sources than subscriptions that are at least equivalent to a share of their "first-copy" publishing costs. (Of course, most of us, as scientists, are impatient with such matters.)

COPYRIGHT-TRANSFER FORMS

The third of our involvements with publications, especially recently, has been—as authors—with the need to sign a copyright-transfer form for each of our papers. Prior to the passage of the new U. S. Copyright Statute—in 1976, effective 1978—we were rarely asked to sign these: copyright transfer was deemed to be implicit in the act of publication. This new requirement opened something of a Pandora's Box for us and for our employers. Most of us had long felt a reasonably restrained annoyance with previous restrictions placed by publishers on our and our employers' ability to use our own publisher-copyrighted papers, especially in our freedom to make copies even for in-house use. However, when our employers learned that the new Copyright Statutes provide for *author* retention of all but "compendium-publication" rights unless the publisher receives a written transfer of copyright, many employers began to add clauses to publisher-submitted copyright-transfer forms in order to retain certain desired rights and eventually to work with publishers to get these clauses included in their forms. (The American Chemical Society's copyright-transfer practices are exemplary.) In the meantime, the publication of some papers was delayed.

Most of us are aware that the worst of this copyright-transfer turmoil seems to be over—that publication of our papers is now rarely delayed because of it. Most of us have

conceded, albeit vaguely, that publishers really seem to need many of our copyrights to protect their reputations, and ours, against misuse of our writings, and centrally to represent authors in a variety of still-developing ways. There is still confusion about some of this; some learned scientist-managed societies (not the ACS) have refused to ask their authors for copyright transfers, but even these are now at least aware that because of this they are unable to grant even royalty-free permissions, much less licenses, for anyone to make photocopies, and that they cannot make their papers available in digital form for searching. This means that they must tell would-be users to seek such permissions from each author, usually an impractical task.

PROFESSIONAL RESPONSIBILITIES

I will not go into further detail, here, on other reasons why publishers need copyrights and copyright transfers, nor am I going to discuss the intricacies of the Copyright Statute. But I *am* going to consider the consequences of what we do or do not do about these areas. You can tell, by now, that I believe firmly that chemists should care about copyright because, in the main, that means caring about the health and continuation of quality publishing. And for quality publishing, as for everything else in this life, there is no such thing as a free lunch. Here, we must pay for what we want either through subscriptions (which we now obtain much less frequently), page charges (which most chemists have declined to pay), or photocopying royalties (which some of us have been avoiding). If we do not do more than we have, we must expect the near-future demise of a good many low-circulation, high-quality journals just as we go into a technological era that will be exciting for users but fraught with real problems for authors and publishers, an era in which—unless users are careful—we may receive customized, electronic delivery of little that is newly published or attractively presented.

Now, what can we do about all this? For one thing, we should stop playing copyright lawyer and stop applauding a few belligerent individuals for doing this. If our goal is to support quality publishing, and if we recognize that this means paying for it, we should stop looking for loopholes in the Copyright Statute that *might* obviate the need for us to pay anything. Here, I particularly like my employer's code of ethics, which calls for "strict observation of all laws applicable to its business" and opts for "the course of highest integrity . . . even where the law is permissive". Obviously, this does *not* permit developing a copyright-compliance program based on several principles whose probability of correctness is each much less than 100%. (Also, statistical theory teaches us that even if each operational principle in a four-point program has a probability of correctness of 80%, the overall program will still have a probability of only 41%.)

But if we become strict constructionists, we must also expect to pay the piper. If we are expected to pay page charges, we must pay them except in dire circumstances. If we want our libraries to subscribe to journals, we must help to see that they have the funds for such acquisitions. If we like library plans for networking, we must help networks to pay the requisite fees to publishers for their photocopying. If we want electronic delivery of documents, we must again insist that the fees include the payments to publishers that will help to guarantee publishing quality and continuity. Certainly, we should be concerned about economical as well as quality publishing, and about reasonable rather than outlandish subscription charges and photocopying fees, but we have ways for monitoring these, such as service on governing or advisory committees, that do not require us to destroy publishing.

So "why should *chemists* care about *copyright*"? As authors, we must care about the opportunities that the Copyright

Statute affords us and our publishers for ethical and quality publishing. As users of information, we must care about having quality publication continue, about having a robust publishing industry that can make an optimum transition to electronic publishing. As ethical professionals, we must stop cutting statutory corners or permitting others to do this mistakenly for us. As responsible members of society, we must involve ourselves, wherever possible, in the proper governing of the agencies involved, including their adequate funding. If publishing is important, we must fund it. If libraries are important, we must also fund their programs in such a way as to support, not undercut, publishing. To these extents,

copyright is important, and we should care about its consequences even if that means, ultimately, seeing to it that our representatives work to assure that the clarity of the Copyright Statute reflects their intent.

There will be some who will maintain that I have oversimplified the situation, that I have not shown a proper regard for the needs of the general public for "free access" in libraries. I agree that copyright is a complicated matter, but I also maintain that sometimes it is simply being used as a stalking horse for underfunded social causes. I repeat, there is no such thing as a free lunch, so we must be vigilant to prevent those who would serve one here from destroying quality publishing.

Expanding Use of the Copyright Clearance Center[†]

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Not only is it important for organizations to comply with the newly revised copyright law, it is important that they recognize why it is ultimately in their own best interest to compensate the outside information sources used by paying authorization fees whenever secondary uses are made of copyrighted publications by making photocopies. The Copyright Clearance Center can help organizations do that with speed, convenience, and low cost.

Each of you as users of chemical information need continuing access to a flow of reliable information. You may never give it a conscious thought, but most of you make use of several "outside" sources of published information in carrying out your jobs. Anything threatening the sources of supply or the long-term welfare of "outside" producers of information could ultimately become a threat to the success of your businesses as well as your own professional career activities. If a large number of scientific and professional journals were discontinued as a result of economic failure, this would soon become a matter of serious concern to everyone engaged in research or development.

In addition to the basic need of access to outside information sources, nearly everyone's organization needs the right to make secondary uses of the publications they purchase. Though these publications, for the most part, are protected by copyright, many articles and other information items contained therein must often be photocopied and distributed internally to you and your colleagues. In some situations, photocopies must be acquired from outside document delivery supply houses on a price-per-copy basis to get the information you need.

Because there are limits set by copyright law as to the conditions under which reproduction, distribution, and/or resale of copyrighted materials can be done without authorization from copyright owners, there needs to be a means of your getting these authorizations, when needed, with the least expenditure of time and cost. This is the purpose for which the Copyright Clearance Center (CCC) was established. Our intent is to provide your organization with a convenient centralized service where permissions to photocopy can be obtained at prices established individually and independently by copyright owners.

USER NEEDS

There are counterparts to CCC in the music business.

ASCAP and BMI are two organizations that license places of business, broadcast networks, and others, who find it advantageous to replay music performances. Playing music helps to make businesses "go". It is the mainstay of many radio stations and an important ingredient for creating the desired atmosphere in most restaurants. Your own firm may be using it in manufacturing plants or to keep customers happy while waiting on the telephone line.

Notice that none of these users are making reproduction copies for sale in a bootleg-copy market. Users of these licenses simply need to use cassette tapes, phonograph records, or whatever the purchased items are for more than individual personal use. Broadcast networks, hotels, restaurants, and the like find their need to replay copyrighted music performances as important an ingredient, today, as bricks, mortar, food and beverage supplies, air conditioning, heat, light, and the other goods and services being used to make their businesses successful. Without the use of these music performance replay licenses, any one of these establishments would consider themselves disadvantaged in doing business.

Let us look at what every information user organization in industry does and needs to do with copyrighted publications. It need not be explained that engineers, scientists, managers, attorneys, executives, marketers, and salesman, in fact, people in all job areas, need to utilize reliable information in order to make their firm's businesses go. Manpower, money, machines, methods, materials, markets and management are all basic ingredients required by a functioning enterprise. The added vital activity that connects these together into a functioning fabric or whole is information flow. Three of the better-known types of important information are scientific and technical, economic and financial, and marketing.

Essential information flow, in some cases, comes from outside sources that use copyrighted publications as their media for reaching users. Reports of outside scientific research, for example, mainly flow through scholarly journals. Fast-moving economic and financial information are provided via a variety of copyrighted publications. A vigorous and healthy source of supply for each of these and other information sources is required to support the well-being of nearly every firm in

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