Patent Office. Some employers, however, are of the viewpoint that a patent examiner may have developed a negative attitude toward patentability, *i.e.*, he may be more skilled at rejecting patents than securing them, and for this reason may *not* prefer a former examiner.

Patent attorneys, having a law degree and having passed the patent law examination, find a wide range of opportunities both in private practice and in corporations. The patent attorney can handle patent matters either in the patent office or in court, in contradistinction to the patent agent who is not a lawyer but has merely passed the patent law examination and can only handle patent matters within the Patent Office. The work of a patent attorney is quite varied and challenging. However, the individual gradually becomes less of a chemist and more of an attorney. This situation should be well borne in mind early in the selection of a patent career.

Probably the most important category of careers in patent work for the chemist is in the "patent liaison group" of large chemical companies. The specific functions and organization of liaison groups vary; however, certain generalizations can safely be made. The "liaison man" generally coördinates all efforts between the laboratory and the attorney in the development of patents. The liaison chemist's duties may generally include the writing of the patent specification and an outline of subject matter to be claimed. However, the attorney generally does the wording of the patent claims, determines inventorship, handles all prosecution, and decides questions of infringement and validity. Liaison personnel are usually selected from amongst the accomplished or senior chemists within the company, and initial assignments may be in the area of the chemist's recent experience. Previous knowledge or experience in patent work is not usually essential. In the environment of the liaison group, all aspects of patent practice can be learned quickly in view of the volume and diversity of patent problems and the opportunity for close association with individuals of similar backgrounds and interests. Within a few years in the liaison group, most chemists can, with little difficulty, pass the patent law examination to become registered patent agents. The liaison man may generally follow the work of thirty or more research chemists and usually secures as broad a grasp of over-all company research objectives and progress as management personnel in the research divisions. The liaison man thus has a pseudo-supervisory position. His advice on research matters is often sought by management and research personnel. Much of the patent work in a large corporation is of a defensive nature, that is, to prevent others from patenting the same thing. Thus, seemingly minor improvements in plant processes or equipment frequently are filed upon. Accordingly, the liaison man is frequently called upon to prepare cases where the odds against patentability are high in view of extremely close prior art, but where one cannot be certain as to whether or not a competitor could, with enough ingenuity, secure a patent on the same technology. Some mechanical inventions may have to be handled if they fall within the patent man's general area of responsibility. In important company developments, groups of patent cases of interrelated inventorship and technology often arise. These are generally woven into a strategic defense network of patents to protect all aspects of a newly planned business venture. Speculative patent applications, where it is merely desired to create new patent property for possible sale or barter to others, are rare.

Experienced patent chemists generally are sought by smaller consulting or manufacturing companies for assignments which may include all aspects of patent practice plus other administrative or research duties as well. The smaller company often requires a good patent position on inventions to establish manufacturing feasibility. In many instances a small company may develop an idea which it cannot afford to commercialize. Based on a filed patent application, the company may try either to sell the invention or attract the necessary capital required for commercialization. This aspect of patent work requires the best possible patent drafting, the ability to appraise the monetary value of inventions, and the ability to sell ideas, patent applications or patents.

In conclusion, it is seen that a patent chemist is a sort of professional chameleon. He can be part chemist, chemical engineer, lawyer, businessman, or salesman. In view of the great diversity of gradations of challenging job characteristics, it is a wonder that the field is not overcrowded and "booked solid" for years to come.

The Literature Chemist in Patent Liaison*

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There are some interesting opportunities for literature chemists to take part in patent work in medium-sized and small chemical companies which do not maintain patent departments. Patent protection is sought for the discoveries made in such companies just as it is by larger firms. Recognizing the value of patents, employers usually provide the best legal talent they can afford to obtain the patents, yet they may be disappointed with the results.

What management may fail to realize is that in many cases the research chemist who made the invention and the patent attorney from an outside legal organization—the so-called "outside attorney"—may not speak the same language and that there is no common ground on which they can get together. Unless care is taken to provide

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a bond or connecting link and to coördinate their activities—in other words, liaison—information vital to the patent may never come out. The resulting patent may be weak or may be lost altogether. Poor communication will result in disappointment and frustration to both sides.

Small organizations employing outside legal counsel are thus shown to have even greater need for effective liaison than large companies who provide it as a matter of course in their patent departments.

It is obviously impossible to expect each research chemist to become an expert in patent terminology so that he can understand the patent attorney. Many patent attorneys, on the other hand, do have a background of chemistry, but chances are poor that a given attorney will be expert in the inventor's area of interest. This problem in communication might be solved by having a person with a working knowledge of both disciplines to serve the liaison function.

The information specialist of the research department, whether known as literature chemist, chemical librarian or research librarian—but a chemist in any case—would be a logical choice, especially if he were already familiar with patents. Such a person can make a real contribution, depending on the effort he makes to prepare himself, his recognition of specific needs, and his ability to deliver. He will derive a great deal of satisfaction from the stimulating contacts he makes and from the knowledge that he is contributing to creative work.

A brief review of what goes into a patent may serve to point up the areas where liaison is needed and how the literature chemist fits in. First, of course, comes the idea, which patent people call "conception." Ideas cannot be patented, however, although their embodiments can be. Finding a way to make the idea work so that it results in "a new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement of the same," is known as "reduction to practice."

Not until the chemist goes to the library to determine whether his discovery is novel can the literature chemist be of much help. The chemist finds that the standard bibliographical tools and abstract journals are totally inadequate for searching patents. The literature chemist can therefore make his first real contribution to patents by taking the time and trouble to learn the techniques for conducting a thorough search of the type known as a "state of the art" search.

The best, and in fact, the only satisfactory way to conduct such a search is in the Search Room of the Patent Office in Washington. Once he knows how to use the many facilities available in the Patent Office (see Appendix A), the literature chemist can decide whether to conduct a given search personally in the Search Room or through the classified lists of patents available there, or to have the search conducted by others. There are the same advantages in conducting a patent search personally as in conducting any other kind of literature search personally.

After he has located and purchased the related patents, the literature chemist can render a second helpful service by summarizing the disclosures of these patents. The inexperienced inventor may consider only the claims of the patents, but the "specification" or body of the patent may disclose facts which are not claimed but which bar patentability as effectively as though they had been claimed. The summary which is made will be useful in many ways.

The literature chemist should encourage a search of the art as early as possible in the proceedings before much time and expense have been involved in a project which may already have been described or patented.

After making sure that his discovery is novel, the inventor must complete his reduction to practice by finding uses for his product, process, or composition of matter. The tests performed by different people to show utility will need to be described in the application for patent, and the literature chemist can relieve the inventor of the details of assembling the descriptions and results of such tests.

The literature chemist with patent experience can help the inventor to decide when his reduction to practice is complete enough to support an application for patent. Such a service is truly patent liaison, for such questions as the following are the very ones the attorney will ask to forestall the examiner's rejections: Have the best methods for making the new product or using the new process been worked out so that the patent will "set forth the best mode contemplated by the inventor of carrying out his invention," as specified by law? Are proportions of reactants or their order of addition critical? Are temperature, pressure, and the presence of catalysts or solvents important? How many examples are needed to support broad claims? How many homologs or analogs need to be tested? Can the inventive concept be extended to other types of reactions or to other classes of compounds?

It is helpful to furnish the attorney with all the facts before he is called in to confer with the inventor. The liaison person can make a most welcome contribution here if he arranges this information in meaningful form rather than furnishing it in disconnected laboratory reports, descriptions of tests and literature summaries. If the attorney has adequate background information at hand, he will be able to discuss the invention intelligently.

The need for liaison drops after the attorney takes over a case, but there are continuing opportunities to help him marshal arguments and facts in defense of the application, and to help the inventor by interpreting the language of Office actions.

The experience of one medium-sized company may serve to illustrate how a literature chemist who saw the need for patent liaison and who took steps to inform himself on patent matters has helped to evolve an orderly procedure (which is still evolving) to meet the needs of the organization. This example is offered in the hope that it will be of interest to any who may be unaware of a need for patent liaison in their own organizations, and to those who may not be satisfied with their own efforts in this direction.

In this particular company, where the librarian is a Ph.D. chemist and a full member of the research team, patent liaison may be said to begin when a new project is initiated and information is requested on a current basis. It starts in real earnest when a request comes for a literature and patent search to supplement that of the inventor. The research people have come to call for a state of the art search early, so as not to waste time and effort on a discovery which already has been documented.

The patent search is always conducted in the Search Room of the Patent Office after other types of literature have been searched in the company library. Pertinent patents are purchased, summarized—as much as possible in tabular form—and forwarded to the inventor.

In the event that these patents—known as "the art"—come very close to describing the new invention, the attorney is briefed and brought in at once to consider the advisability of continuing work. He is assisted in trying to devise ways of distinguishing between the invention and the prior art by a team made up of the inventor(s) and those most familiar with his work.

After working out as many details of the invention as possible, the inventor turns over descriptions of preparative methods and results to the literature chemist who also collects reports of development tests performed by others. Summaries of the laboratory work are combined with a review of the related art, an introduction to the field if it is new to the attorney, a detailed description of the inventive concept, and some indication of what the inventor feels should be claimed. When this mass of information has been revised carefully by the inventor and his team for accuracy and completeness, figures double-checked against original records and trade-named products described, it serves to brief the attorney. For the attorney's information, more background information is submitted than is needed for the application so that he can develop the specification as he deems best. Under ideal conditions, the attorney has time to study the brief ahead of a conference.

The literature chemist sits in on conferences with the attorney chiefly as a spectator, for his main job has been completed with submission of the brief. However, he stands ready to interpret whenever he senses a breakdown in communication. He handles the details of noting suggestions for additional work to strengthen the case and sees to it that results of such work are reported for possible inclusion in the application.

The application is submitted for correction and suggestions before it is filed in the Patent Office. The literature chemist helps here by meeting with the inventor's team and putting their suggestions or revisions into proper form for submission to the attorney.

The same sort of thing is done when the attorney asks for suggestions for his replies to Office actions. It is helpful in this case to be able to interpret the formal language of Office actions, particularly rejections, which often carry connotations quite foreign to customary usage.

The liaison person can be very helpful, as a matter of fact, in interpreting patent language not only to the inventor but also to management. Such an expression as "final rejection," for instance, may need interpretation. Such language has been known to cause consternation and panic and even to abandonment of applications which could have matured to valuable patents if it had been understood that the term "final rejection" means that claims have not yet been put into acceptable language. It means rejection of the language of the claims, not of the invention. It often requires patience and practice to distinguish both chemically and verbally between applicant's invention and those of prior art. Since the examiner cannot rephrase claims he can only reject unsatisfactory ones until the patentable differences are made clear.

"Infringement" is another misunderstood term. It is not necessarily synonymous with litigation. All legal terms should be carefully explained to anyone making patent decisions.

The literature chemist may well ask at this point just what sort of preparation is required of those who wish to serve in a liaison capacity.

The first requirement is a solid background of chemistry. The second is a working knowledge of patent law and practice such as can be acquired through reading and working with patents. The training need not be formal. Unless one intends to write patent applications and prosecute them through the Patent Office, he need not pass the examination required of registered patent agents. He should, however, become familiar with the contents of the handbooks published by the Patent Office (see Appendix B) including that on *Patents*, one on *Rules of Practice*, the *Manual of Patent Examining Procedure* and the *Manual of Classification*. He should learn how to use the many types of information contained in the *Official Gazette*. There are good textbooks available, some in nontechnical language. *The United States Patents Quarterly* or *USPQ* is excellent for an understanding of case law and how court decisions are reached. Even abstracting of patents for cataloguing purposes is good practice. Very fruitful sources of information, especially on rejections and overcoming them, are the case histories, the so-called "file wrappers" of issued patents which are open to public inspection in the Search Room. And perhaps the best and easiest way to learn liaison is to observe and work with a good attorney.

Other requirements include patience and perseverance, a liking for semantics, and some ability to organize facts and marshal arguments. Intuition and a sense of humor would also be helpful.

The literature chemist who prepares himself and is willing to learn as he goes along will find his services not only useful but also necessary and very much appreciated.

APPENDIX A

The variety of search tools available in the Patent Office may not be known to many literature chemists. It includes:

a. A library of loose patents arranged by class and having cross references, clearly marked as such, interleaved with them. Bundles of these patents may be taken from the stacks and examined at desks fitted with boxes to hold the patents upright.
b. A library of patents bound in numerical order.
c. An index of patents in numerical order, giving the present classification of each.
d. Lists of all the patents, as well as cross references in each, by class. Copies of these lists may be purchased, so that if desired classes may be searched at home through *Chemical Abstracts*.
e. Case histories or file wrappers of all issued patents and of certain abandoned applications are open for public inspection. These contain the record of the entire prosecution.
f. A well-stocked Scientific Library containing, among other holdings, bound volumes of foreign patents.

g. The Search Room personnel are very helpful in all respects.
h. Assignment records show to whom patents have been assigned since a patent issued.
i. The same type of information as is available for patents is also available for trademarks.
j. Patents may be purchased on the premises, with delivery within a few hours.
k. There is a mail order service, not only for domestic patents, but also for trademarks, photocopies of foreign patents, indeed for photocopies of any documents which are open for public inspection.

APPENDIX B

Sources of information about patent law and practice include:

I. Patent Office Publications:
   a. United States Code, Title 35—Patents.
   b. *Rules of Practice,* United States Patent Office in Patent Cases.
   c. United States Patent Office *Manual of Classification.*
   d. *Manual of Patent Examining Procedure.*
   e. *Official Gazette.* This contains much information in addition to the broad claims of newly-issued patents.

II. The *United States Patents Quarterly.* Published weekly but collected and bound quarterly, this publication gives in full the decisions of the Patent Office and of all courts having jurisdiction over patents.

III. Textbooks, both technical and nontechnical.

IV. Case histories or file wrappers are invaluable for a study of why and how claims are rejected and the process of working out language which fits the invention and does not infringe a patent. There is much to be learned from any case history.

V. The attorney employed by the company will be glad to offer suggestions, once he sees what effective liaison can do for him.

Patent Liaison—A Service to Industrial Management*

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Patent liaison is a link in the chain connecting the industrial inventor with the Patent Office. Conventionally, the patent chemist is concerned with processing inventive ideas and the supporting data into a unified picture leading to a patent application. However, liaison work involves both research and legal operations, and requires consideration of the problems of sales and manufacturing as well. Therefore, the patent chemist is well situated to interrelate all four points of view. For this reason, he may also perform a second function—staff advisor to management.

A patent can be the turning point in a major management decision.

For example, the president of a chemical manufacturing company may be considering a business expansion. On the basis of research results, he may have two new products from which to choose. The two may be equal, so far as immediate sales returns are concerned, but far different when the growth picture is taken into account. In a hypothetical case, one product may find a 10% share of a $10 million market, with six established competitors; the other may offer an exclusive position in a new $1 million market, with good possibilities for expansion.

Most executives would choose the second product without hesitation, provided that it had the support and protection of a strong product patent.

Decisions like this are being made every day in the chemical industry. Time after time, someone asks "What is the patent situation?" The man who makes sure that the product claim is there to cover the new market, the man who points out to management the importance of the claim, is the patent chemist, be he a technical liaison man, a patent agent, or a patent attorney. In a chemical industry of growing complexity, and faced with increasing competition, the patent chemist is participating more and more in management decisions.

In the past twenty years, the patent chemist's job has gained recognition. Several papers[1-4] presented before this Division and the Division of Chemical Education in the past few years, have described patent service. The patent chemist frequently is an experienced research worker who has become familiar with patent procedures. He has some knowledge of patent law, if only through continued exposure. One of his important functions is to provide liaison between the laboratory chemist and the patent attorney, with a foot in each camp. Because of his technical background, he has a research chemist's enthusiasm for a new idea, but because of his experience with the trials and tribulations of those prosecuting patent applications, he appreciates the patent attorney's wariness and caution. He knows that the patent literature is full of disclosures which may anticipate even the most brilliant idea.

In performing his liaison responsibilities, the patent chemist inevitably becomes a clearing house for questions

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