

recipient is located in a developing country. The stakes are heightened further because the needs of the recipient frequently transcend mere commercial considerations. Several disciplines are needed — involving a variety of technical and cultural skills — to forge meaningful relationships. The fact that each project has many virtually unique features that prevent generalization adds to the scope of the problem.

There thus exists an exciting challenge, requiring the application of all available resources. Consultants can play an important role in this process and this is becoming increasingly recognized. The professional opportunity is sufficiently rewarding, in the broadest sense, to attract worthy and creative practitioners.

*\*About the Speaker: Robert Goldscheider is a member of the Industrial Property Rights Group, international licensing consultants.*

The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the Secretariat of UNIDO. This document has been reproduced without formal editing.

### "GET THAT TECHNOLOGY MOVING"

*Talk by E. G. Fronko\*  
to the National Association of Manufacturers  
March 7, 1973*

Technology has been taking a sound drubbing in the past few years. It would seem that everything that is wrong with America today is due to technology. It's technology that has polluted our air — technology that has polluted our waterways. New technologies have supposedly generated energy intensive industries causing an energy crisis, and of course, that new fangled invention the automobile is smothering our large metropolitan areas. I often wonder what the environmentalists would be saying today if the automobile had never been invented and we were faced with the mounting problems generated by 90 million horses being on our streets.

But maybe everything isn't quite that bad. In spite of Government cutbacks in R & D funding, in spite of the apparent lack of enthusiastic interest in science and technology by demoting the position in the administration, there are some encouraging signs. More and more people are recognizing that technology *will* be required to solve our energy crisis — albeit this is a short term crisis. The 1972 water pollution control act recognizes the need for technology when "it calls for the total elimination of effluent by mandating the best available technology". A recent article in BUSINESS WEEK suggests that part of the technological crisis is due not to the *lack* of technology but to our *failure* to use technology *we already had*. BUSINESS WEEK pointed out that one-third of all Americans (including the residents of Manhattan) have no primary sewage treatment — even though the technology has been available for decades. Similarly some utilities have not installed stack controls even though precipitators were invented nearly fifty years ago.

There were two announcements recently that merit the term breakthrough. Alcoa announced building a

new aluminum smelting process that would use 30% less energy and eliminate fluoride emissions. Anaconda unveiled a chemical process for Leaching copper from ore without creating any sulphur oxides — the bane of traditional copper smelting. Although I don't know when the technology was "discovered" that permitted these advancements by Alcoa and Anaconda, I would hazard a guess that it was at least five to ten years ago.

How many other technologies are lurking in the wings? How many more technologies have already been discovered that have not been put to useful effort and are not being pursued? After a year of trying to find ways to stimulate R & D and find ways to apply the results effectively, one Nat. Bur. of Stds. official says "at first, we felt the solutions had to do with developing new technologies, but now we know the problems have more to do with market and distribution mechanisms than with hardware."

I am not suggesting that we stop our support of basic R & D. Stanford University Vice President, William F. Miller, said recently "lack of strong support of basic science will lead to an intellectual recession which in turn will retard technology and economic growth."

We must continue a strong effort to support basic science, and develop our future technologies.

However, even as we explore secondary and tertiary oil recovery means to help solve the energy crisis, perhaps it is time to re-evaluate the vast warehouse of technology generated during the past 20 years of extensive R & D effort. Have new discoveries been made which now make earlier discoveries valuable? Are there useful technologies already developed which can help solve the country's social & economic objectives?

Of equal importance to industry, however, is whether these untapped resources can generate *additional profit* dollars for our companies in addition to the contribution that can be made to the curing of social ills.

The General Electric Company has an intensive program — started in 1965 — with the objective of gaining greater utilization from GE generated technology. Greater utilization *within* the General Electric Company, but equally important — great application of selected technologies — used and under utilized technologies *outside* the Company.

Within the General Electric Company we have some 36,000 professional engineers and scientists working on a broad range of technical disciplines including chemistry, metallurgy, electronics, etc. This technical creative power generates over 1,000 new patents each year. The patent represents only the visible creativity — supporting it is the know-how and technical expertise which gives patents a greater opportunity for profitable utilization.

My task, as Manager of the Technology Marketing Operation, during the last six years has been to find ways to more profitably utilize these resources.

Our first priority, of course, is to determine if the General Electric Company can turn these assets into viable General Electric businesses. However, my main focus is to find the technologies which the Company

does not expect, *itself*, to exploit and where the opportunity might be better fulfilled by firms other than the General Electric Company. We seek out those technologies that are being *under* utilized even though we are taking advantage of the breakthroughs — and where it would be in our total best interest to offer those technologies to others. Let me give you a few examples.

In the early 1960's designers of GE's fractional horsepower motors wanted to use aluminum shafts and bearings in new motor designs. There was only one problem — there was not a good lubricant available that would assure proper lubrication of aluminum surfaces. Scientists at our Research Center went to work on this problem, and invented a new compound that met the need.

The motor designers were able to improve their designs by converting to aluminum shafts and bearings, using the proprietary compound. The Technology Marketing Operation saw this as an opportunity for even broader use. Although the General Electric Company is in the chemical business, it was not felt that we could efficiently market a specialty lubricant through existing marketing and distribution channels. It was also recognized that such a special lubricant would probably never have sufficient demand to justify the expenditure of establishing a new distribution system. The decision was made, therefore, to seek out a manufacturer who could produce the lubricant and who would have the best distribution and selling organization to take it to the market. The E. F. Houghton Company of Philadelphia entered into an agreement with the General Electric Company obtaining certain patent rights in addition to the know-how required for production of the compound.

This under utilized technology not only aided us in developing a better fractional horsepower motor, but through the licensing of patent rights and know-how we have realized a substantial return on our original development work, and at the same time the E. F. Houghton Company was able to add a product line that now exceeds one million dollars in sales annually.

Another example of an under utilized technology developed into a viable tool for industry is an invention dating back to the early 1960's when our Reentry and Space Vehicle Department had a need to build a space simulator of large aluminum panels. The specifications required a finished surface absolutely void of any flux contaminants. Aluminum joining processes available at that time were unacceptable. GE engineers and scientists went to work on the problem and discovered that aluminum surfaces could be joined without the use of any flux by introducing magnesium vapor to the surfaces. This technique was used to solve the immediate problem at hand, and was recognized as a discovery with significant potential widespread uses. The process did require the use of vacuum equipment, however, and in the early 60's vacuum processing was an unfamiliar technology to most process engineers. Although the process was demonstrated in a job shop operation, it was certainly a long way from proven production viability.

The Technology Marketing Operation undertook

a program to move this technology forward, and did so by making agreements with both Reynolds Aluminum and Alcoa who immediately saw the great potential in the process for converting users of other metals to aluminum. The process is now licensed to three domestic manufacturers, the largest of which is Philco-Ford. Philco-Ford's installation of five large vacuum furnaces which operate on a semi-continuous basis to produce automobile air conditioner evaporators is a far cry from the small batch process that was available ten years ago. In addition to the economic advantages gained by Philco-Ford in using this process, rather than the salt bath process which has been most commonly used — is its elimination of pollution. Philco-Ford estimated it would take as long as 40 hours of water washing to assure their assemblies were clean. At the rate of several million assemblies a year, the inference of 40 hours of washing of each assembly staggers the imagination. The ecology problem of disposing of over 3,000,000 lbs. of salt is equally staggering. The diligent pursuit of this technology over a ten year span has resulted in pay-back for the General Electric Company for its initial development work, increased sales of aluminum by the aluminum industry, a more contaminant free heat exchanger product for the consumer, and economic saving for the Philco-Ford Company, and equally important — less damage to the environment.

Both of these examples have a common thread from time of inception to utilization-time-over 10 years. The other common denominator is the fact that both of these processes did, in fact, accomplish the immediate purposes for which they were developed. However, they were not used to their fullest by GE. General Electric Management's foresight in establishing the Technology Marketing Operation as a full time organization to bring such technologies to fruition provided the mechanism to insure these developments were not lost after they accomplished the immediate objective.

We could go on with many other examples, and obviously I could give you examples of failures. Many projects we have worked on have failed. The task of finding viable unused or under utilized technology contains a high failure rate. 60% of the technologies we initially evaluate for development externally fail to get any further consideration. Of the 40% that our organization feels are viable, we are successful in transferring the technology to another company in approximately 25% of the cases. So roughly 10% of those items we review result in a transfer to others.

You probably are now convinced that this is not a profitable endeavor for your company to undertake. But you're wrong. It *is* profitable for GE and I'm convinced every company with technological assets can make it profitable. To do so requires:

1. Top management commitment.
2. Assignment of responsibility and authority.
3. Organization and people.
4. Profit measurement and profit orientation by those charged with responsibility.

Operating profitably in the field of technology transfer requires keen evaluation techniques to pick

the losers. Yes I said losers — because you *can't afford* to spend more time on those!!

What is the least amount of time and money you can invest to determine the technology is *not* viable? Doing nothing — does *not* insure it is *not* viable.

This philosophy is quite different than asking "How much do we need to invest to *make* it viable". Technology is really a personal matter. The inventor or developer or others can get quite turned-on. Management's task is to control that enthusiasm without losing creativity and without losing your profits by chasing *losers*.

This apparent "unaggressive" marketing effort to get technology moving puts some of the burden of selection on those who can use or need the benefits of the technology.

They, too, need to make an investment to seek out the available sources of technology — a relatively minimum initial investment just to screen opportunities from many currently available sources — and then the commitment of additional time and money to determine if it is of value to the user.

In addition to investment of minimal resources, the Company seeking technology has to shed its N.I.H. factor. Although the "Not Invented Here" syndrome seems to be lessening, it still prevails. For some psychological reason the American scientist, engineer, and business man feels that it is to his discredit if he buys an idea, a technology, or an improvement from anyone else — especially his competition. Even more baffling is that these same engineers, scientists, and management people do not feel ashamed to purchase technology and ideas from abroad. To truly get technology moving again in this country, management must be convinced of the value of buying, under profitable terms, the intellectual values, technologies, and patent assets that are available from their fellow Americans.

In only a few years, the Japanese have grown to be a major economic force. There are many reasons for this, but I would suggest that one of the major reasons is their unashamed search for purchase of technology developed by others.

To get technology moving again it is necessary that it has some place to go, someone to nurture it, develop it, grow it, use it. As a marketer of technology, I sometimes feel that we are driving the horses to water, but we can't make very many drink. Too often the prospect is preoccupied with the question of why the General Electric Company with all its talent and resources is offering its developments to others. This is a question raised with suspicion and the Not Invented Here syndrome. The answer to the question in the case of General Electric — and everyone else's case I am sure — is the same. Our Company's order of priority for things to do may not include this particular technology. That does not mean that it is not good or that it lacks merit. In fact, in many cases, someone else might do a better job of developing it than we could even if we did apply priority to it.

All companies — even GE — have limited resources in dollars and manpower — to accomplish all they would like to. Each company has its own vision for

growth and plans to achieve their forecast. As such it's inevitable some technologies will not meet their priority schedule. Although GE may not pursue the opportunity internally, the technology is given new life through its Technology Marketing Operation.

Until such time as American businessmen eliminate their N.I.H. and begin to adopt, if you will, the Japanese attitude of seriously evaluating, then purchasing or licensing, work done by others, I am afraid much under utilized and unused technologies will continue to be a wasted national resource.

If American businessmen are slow to buy American technology, why offer them a product-technology — that they aren't buying? Well, first, attitudes *are* changing — more enlightened businessmen see the leverage opportunity from buying technology in time and money savings. Second, the seller of technology can obtain a return on "sunk" costs.

However, let's face it, the prime objective of American business is not to exchange technology, most companies are not developing technology just to sell it to others. Consequently, the profit return from spinning off technology will rarely become a highly significant portion of the total profit of the corporation. Nevertheless, these are additional profit dollars, unencumbered by additional investment, without the need for raising capital, hiring and training personnel, or accruing liabilities for product complaints, etc. Let me re-emphasize that point. Revenue generated from the sale or licensing of under utilized or unused technologies are profit dollars. The only costs are those associated with marketing the product. The rest shows up in the lower right hand corner.

There are other reasons why American industry should look closer at utilizing their under used technology.

One of these is greater employee satisfaction. There is nothing more damaging to the engineers creativity than to see his breakthrough languishing in the corporate "safe" as something to do later "when we have the time and money to implement". The fact that his management is willing to take his work and have others develop it, if his company is not in a position to do so, permits our creative people to see the fulfillment of their dreams; then happily go to work on another prospect which may have a higher company priority.

Another important reason that companies should diligently pursue sale or licensing of technology is the public "good will" generated. There are some authorities who argue compulsory licensing of *all* patents is the way to get technology moving. I strongly disagree with any steps which would reduce the incentives to innovation which are provided by the present patent law. Greater effort by industry to get unused patents and technology licensed — while retaining rights to develop your own inventions — seems to me to be the better answer.

Finally, stockholders and the general public gain a more favorable image of your company when they see efforts are being made to maximize the return on investment in research, development and engineering through an ongoing program of licensing.

In closing, sharing of patent rights and technology with others under mutually agreed terms can be *profitable* for both parties. To be profitable requires effort by both parties to give a fair evaluation and exposure of the opportunity. Such effort can do much to continue the industrial development and economic growth in this country.

And by so doing, it is very possible that the word "technology" will be fully acceptable again, and in fact we might even find some unused technologies that would solve many of our current social and economic problems.

*\*About the Speaker: E. G. Fronko is Manager, Technology Marketing Operation, for the General Electric Company, Schenectady, N. Y.*

## **POLSERVICE EXPERIENCE IN LICENCING TO AND FROM POLAND**

by  
*Hubert Janiszewski\**

A rapid growth of international trade after World War II has taken place among other countries of the world also in Poland.

This growth has been connected with especially rapid extension of the traditional exchange of goods into the new forms like: leasing, investment abroad, licencing, cooperation etc. The new forms of trading have been extended even more rapidly than the traditional exchange of goods.

In the late forties came the formation of large integration groups like the Common Market and C.M.E.A. (Council of Mutual Economic Assistance), sharp international competition, customs barriers growth of giant multinational corporations rising new independent nations in Africa and Asia all these new conditions have had important influence on growth of new forms of trade and especially licencing.

These new tendencies, however slightly later than in West Europe and the U.S.A. has also taken place in Socialist countries i.e. in the German Democratic Republic, Poland, Czechoslovakia, USSR, Hungary, Roumania, Bulgaria. In spite of the different social system existing in these countries, the international division of Labor through foreign trade exchange has had important influence on growth and rising of new forms of trade within this area. Up to the middle of the fifties the traditional forms of foreign trade prevailed within Western Countries as well as within the CMEA area. The need for growth of industrial production, and the increasing standard of living has required intensification of exchange of technical documentations, know-how etc. first of all between CMEA members, secondly in larger international scale.

In the late fifties all CMEA countries achieved high technical and research potential, which has shown their possibilities in 1958 by launching the first space artificial satellite Sputnik.

The war damages and destruction in industrial, research and human sources have been restored; in many scientific fields the world primarily was achieved. In many cases hundreds of R and D Institutes and Centres, also giant industry built from the very beginning have formed very solid bases for licencing.

At the beginning of the sixties there were established special trading organizations in the CMEA countries for licencing to and from the individual countries. To one of them belongs POLSERVICE — established in 1961.

As a part of its licencing activity, Polservice has been established for providing patent protection of Polish inventions abroad (and foreign patents in Poland.) With the date of establishment of the POLSERVICE there was formed a new kind of licence (both in export and import) so called "*PURE LICENCE*". What does the term mean — pure licence? By this form of licence it is understood that the licence which is granted from patents, trademark, or know-how agreement is one in which *no goods delivery is expected* in form of technological line, complete turn key delivery, etc. Such a division of licence has been necessary to make use of a lot of developments, know-how, inventions, etc., which could not be *explored in other forms* and which were able supply to the country through licencing (pure licencing) certain amounts of profit in form of royalties.

State monopoly of foreign trade within CMEA countries has enabled formation of trading companies dealing with different goods (including licencing) as well as special trading organizations dealing exclusively with pure licence. The great amount of time, efforts, etc. which is required in licencing has shown that sale or purchase of all kind of licences through big specialized trading organizations is not very effective or profitable and lead to the decision for establishment of special licencing organizations like POLSERVICE. Within the period of 1961-1971 about 80% of the licenses granted by Poland all over the world have been concluded by POLSERVICE! Moreover in comparison with 1960 the amount of licences granted has been increased by approximately 900% in 1971!

Different situation has been observed in importation of licences, but this has been caused by nature of licences sold and purchased in Poland. Whereas Poland sells, first of all so called pure licences, it imports in great majority complete technological lines combined with licences or necessary know-how. In the latter cases such importation of technologies is handled through other trading organizations like POLIMEX-CEKOP for chemical sector, CENTROZAP for mining, foundry and steel making sector, or METAEXPORT for machine tool industry, POLMOT for car making industry, CENTROMOR for shipping industry, or ELECTRIM for energetical sector.

As I have already mentioned, POLSERVICE has been established for handling export and import patents, licences and know-how not connected with goods deliveries as well as for providing consulting