

Encouraging Invention and Applied Science in America and the Republic of China

An Address by David Rines
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本講詞係 Mr. Rines 在交大所講。經渠之請求，本學年度將入交大博士班研究，正由教育部核定中，此為外人申請入中國博士班研究，空前之舉，亦母校之光榮也。

(續 前 期)

It may be of further interest to you to learn something of the very early history and development of the patent law in the United States.

It became the duty of Jefferson and the other two members of his patent board to decide what kind of innovation should, and what kind should not, be rewarded by the grant of a patent; that is, which kind of invention, if protected by a patent, would contribute to the public good. The before-mentioned first American patent law laid down the requirement that, to be patentable, an invention should be "sufficiently useful and important." But what is "sufficiently useful", and what "sufficiently important"? Jefferson put the question in the following words:

"for the benefit of society, I know well the difficulty of drawing a line between the things which are worth to the public the embarrassment of an exclusive patent, and those which are not."

Jefferson and his co-members of the patent board formulated several fundamental considerations to guide them in the task of deciding whether or not, in any particular instance, to grant a patent. I shall dwell upon this topic because our experiences in the United States may perhaps serve to guide your own Patent Office in its future activities.

其煩，務使同仁均能接受，一講就是兩三個鐘點。爲防止講課時的胃疼，上課時除抱了一大堆書本講義外，必有一筒餅乾，隔了一段時間必定邊吃邊講，以止胃疼，同仁等見狀多勸其休息片刻再行繼續亦不聽。直講至離開試驗所調職嘉義爲止。此事試驗所同仁們迄今談到猶唏噓感激不已。其後本局人事更動，啓賢兄內定爲第五區工程處處長，爲了醫好痼疾以便赴任後可以展開工作及抱負，遂再往公保門診中心請求醫生予以詳加檢驗，以便根治，經往臺大醫院作了胃鏡透視及拍照後，醫生已判斷其爲胃癌。惟當時僅告以胃有潰瘍須立即住院手術，否則有生命危險。恰於此時嘉義第五區工程處處長工作剛剛發表，啓賢兄以手術及療養等約須時兩個月，責任心重，遂未手術即赴嘉義工作。兼因到任之初一切均不熟悉，工作自屬辛勞，因之胃疼情形日漸加劇，疼時甚至蹲坐無法站起，遂由啓賢嫂至嘉義接回臺北榮民總醫院手術，手術後經過良好，爲使其能與家屬合作好好休養，遂將病症實況告知，經休養月餘後體力多已恢復，即再往嘉義工作。其間由於其工作辛勤及領導得當，使五區工程處獲得了從未獲得過的榮譽，全省養路競賽第一

名，此外並研究改裝各種築路機械，使五區工程處養路工作機械化又更前進一步。本年元月病發，醫生囑立即住院詳加檢查。於我私下拜訪其主治醫生時，醫生告以藥物已無法治療，亦無法再作手術。自其復發起至去世止，其間僅約六個月，其中以最後之兩三個月最爲痛苦，因癌細胞蔓延關係背部疼痛異常，惟不論如何疼痛從未聞其呻吟及哼叫一聲也，啓賢嫂於此兩三個月期間，衣不解帶，眠不臥床，日夜服侍，備極辛勞，同事及友人等均極欽敬。今啓賢兄已去矣，此不僅係其一家之痛，亦係我公路界及整個工程界之損失也。爲留永久之紀念起見，擬將其生前之各種著作及編譯撰寫之各種文字予以彙集，日後俟機編印成冊，藉以流傳，亦所以紀念故友也。

啓賢夫君靈前 張黃秉軒泣挽

十六載敬愛逾恆，偕老相期，何忍獨
生遺血淚

兩年間醫藥不懈，憂心無告，那堪後

死撫遺孤

As another example, the three-element vacuum tube that was invented by Dr. Lee DeForest, and which made possible remarkable advances in communication, was at one time pronounced, in court proceedings, to be only "a worthless piece of glass."

As still a third example, before the era of the Wright brothers, skilled scientists had "proved" mathematically that a heavier-than-air motor-controlled flying machine was a physical impossibility.

And, within more recent times, the U. S. Navy could at first see nothing in the concept of the atomic bomb; and the mighty Eastman Kodak Company in either the electronic flash photography of our client, Professor Harold E. Edgerton, of the Massachusetts Institute of Technology or Edwin Land's Polaroid self-developing camera.

So it is no longer necessary, according to the law in the United States, that an invention be "important", in order to be patentable. It is sufficient that it be novel and useful. Usually been worked out in the United States is that the subject-matter as a whole that is sought to be patented would not have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject-matter pertains. If it would have been so obvious, the public must be deemed to have the right to use it, and it can not, therefore, be permitted to become controlled by a patent.

It is still the law, in the United States, that, in order that an invention may be patentable, it must possess these three requirements of novelty, utility and unobviousness.

Much has been written on the theme that the day of the little inventor is over, and that inventions are now made only by the research departments of the great corporations. This is not true. It is still a fact that most important inventions are made by the little fellow, often a university engineer or researcher, and usually all that the great corporations are able to contribute is to perfect these little-fellow inventions

For one thing, Jefferson's patent board required that an invention, to be patentable, must first of all be new. Patents had been granted long before, in the mother country, Great Britain, but for items not necessarily having any bearing upon novelty. The British Crown had granted patents to favorites (not inventors); for example, for the exclusive right to dealing in salt, and to manufacture playing cards. One of the conclusions that the patent board arrived at, however, was that no patent should be granted unless the invention introduced something new in the realm. Things that were already commercialized were to belong to the public, and were not to be controlled by a patent.

A second requirement that the patent board laid down for patentability was that the invention must be useful. Patents were not to be granted for crack-pot trivialities.

It is in order to point out, however, that, though the first patent law of the United States laid down, as one of the criteria for patentability, that the invention must be "sufficiently useful and important", it is no longer a requirement for patentability in the United States that the invention be "important". Experience has demonstrated that it is impossible for anybody to know, in advance of experience, how "important" an invention may turn out to be in the future. As an illustration, the telephone, invented by Alexander Graham Bell, is today considered to have been a very "important" invention. At the time that it was originated, however, it was regarded as merely an interesting toy, without any future commercial value whatever, and its promoters experienced great difficulty in their efforts to raise capital for the purpose of exploiting it. A very prominent American, Chauncy Depew, was offered by these promoters a one-sixth interest in this telephone invention for only ten thousand dollars, and he refused the offer. Would you today refuse to buy a one-sixth interest in the multi-billion dollar telephone industry for only ten thousand dollars?

And a third requirement for patentability that has grad-

nology laboratories, were patented and widely licensed to leading companies. With the aid of these inventions and also the inventions of others, including those of Bell Telephone Laboratories, in the radar, communications and industrial fields, these companies and others developed microwave technology to its present state. The microwave waveguide and horn came to the aid of the Allies during the last war as a most potent weapons contribution. This further stimulated Professor Chu, moreover, to develop his own microwave and antenna manufacturing company, Chu Associates in the town of Harvard, Massachusetts. And Dr. Chu's personal contributions to the Massachusetts Institute of Technology and many other universities, including here in Taiwan, are legend.

Another of our clients, a very famous inventor in, among other fields, the field of sonar and radio communications, was the late Professor George Washington Pierce, of Cruft Laboratory, Harvard University. Professor Pierce considered it to be so important that his students should acquire a knowledge of patent law that he arranged that first I, and then later my son, should lecture to his students on the elements of that field of law. Professor Pierce also stimulated his students to make inventions and, during the depression years, when jobs were hard to find, his encouragement took tangible form in that he employed them, at his own expense, to help him with his own inventions. He developed the magnetostriction sonar oscillator and driver, and the piezoelectric crystal oscillator that even today still bears his name. These inventions, the patents on which returned him millions of dollars in licensing royalties, also helped the commercial development of several small companies, such as the General Radio Company of Concord, Massachusetts. Pierce's inventions, furthermore, aided giant companies like RCA, the American Telephone and Telegraph Company, Bendix, Motorola and many others to develop two-way radio communication. These inventions also provided significant electronic tools for warfare that enabled our Navy to protect the Allied Merchant fleets from the lurking menace of enemy

and commercialise them.

This has been demonstrated over and over again. It has been demonstrated, indeed, in my own practice and that of my son. Let me give you several illustrations.

Among our clients has been the before-mentioned Professor Harold E. Edgerton. With the collaboration of his two students, Kenneth J. Germeshausen and Herbert E. Grier, in partnership, he pioneered electronic-flash circuits useful for stroboscopy and photography. They started out as consultants, and then began manufacturing products embodying their inventions. They also began licensing others to manufacture. Their business now has matured into a very large corporation, E. G. & G., employing thousands of technical and business employees, with branches all over the world. It was the patent system that prevented piracy and copying of their ideas, during the infancy of their business and that enabled them to make this significant commercial contribution to their country and the world.

And, in time of strife, their inventions went into wide use as instruments of war to help their nation—in radar, reconnaissance photography, exploding mechanisms, and other applications.

Besides reaping considerable financial reward for themselves, they have generously endowed the Massachusetts Institute of Technology and other institutions of learning. The new Harold E. Edgerton Building and Kenneth J. Germeshausen Chair are two among their lasting contributions.

On a somewhat less massive, but equally important, scale, is the story of the efforts of our beloved before-mentioned Professor Lan Jen Chu. Aided by my son, Robert H. Rines, and the Academy of Applied Science of Cambridge, Massachusetts, he has been endeavouring to get this same kind of cycle started here in Taiwan. While a graduate student, at the Massachusetts Institute of Technology, Dr. Chu pioneered microwave waveguide and electromagnet horn techniques with Professor Wilmer L. Barrow, later Vice-President of the Sperry Rand Corporation. These inventions, tested in the Massachusetts Institute of Tech-

submarines and achieved reliable air-to air and other moving-vehicle radio communication.

Again, our nation and the world, our universities, our commercial companies, and the inventor were all most amply rewarded.

There is also the example of AN WANG, one of your illustrious alumni, and renowned inventor of unimorycores, who also started his own company Wang laboratories.

And we sincerely hope that the provision of university research laboratory facilities, such as those being dedicated at the National Taiwan University and in sway at Chiao Tung University, may provide similar stimulation here. Coupled with your own vigor, imagination and enthusiasm, and the encouragement of your patent laws, this may well serve to bring this same kind of creative entrepreneurship to the Republic of China.

You a not, at the present time, lack investments by great corporations. You should not, however, have despaired even if there had been such a lack. I have described several examples of great benefits conferred upon the world by the little-fellow inventors who were not connected with any great corporation. You have always throughout the ages had, and still have, great inventive ability among your individual selves. Many of our most important inventions were made in China long, long before they were re-invented in the West. All that you need, in order to get your inventive brains working again, is to stimulate your potential inventors. The inauguration of your Patent Office indicates that you are aware of this fact.

I have found a number of parallels between your country and mine. Insofar as the parallel relating to encouragement of invention is concerned, it has contributed materially, in my country, to prosperity such as has never before been witnessed in the history of the world. I bespeak for you a similar attainment. It has also led to numerous military achievements in war. You may have need of similar military achievements in the future.

國立交通大學同學會 第十八屆第三次理監事聯席會議紀錄

日期：五十八年十月十四日下午四時

地點：臺北市鐵路招待所

出席：陳樹曦 張仁滔 章紹周 唐慧貞 鈕伯英

王章清 (段清濤代)

葉佩蘭 (唐慧貞代)

郭宗太 (出國) 繆超鳳 (出國)

列席：李盛春 李孟暹 王迺基 翁兆慶

主席：陳樹曦 紀錄：王迺基

甲、報告事項

一、主席報告(略)

二、總幹事報告

1. 同學通訊錄，現正在積極校對中，預計五十九年元旦可以出版。
 2. 本會會址，已於本年八月二十日遷至臺北市西寧北路六號新址辦公。並於八月二十五日報請社會局備案，副本抄送內政部在案。
 3. 本會所存早期友聲，已着手清理，除自一七一期起每期保存十冊外，其餘已分別包札，俟內部清理後，列冊分贈母校及同學。
 4. 本會所存舊文卷中，尚多值得保存，需再加
5. 察閱，俟整理完畢後，當提請理監事會決定去留。
 6. 第十七及第十八屆理事會新舊任總幹事，會計主任幹事等，業於八月十九日辦理交接竣事。凌晨學長擔任總幹事兩年來，為會務推進，不遺餘力，備極辛勞，已遵照上次理監事會決議，專函致謝。
 7. 本年歡迎回國學人朱蘭成、劉大中、彭松村三位學長茶會，已於九月十一日下午四時假臺北市西寧北路六號舉行，由鍾常務理事皎光主持，是日適逢大雨，出席同學，仍達卅餘人。
 8. 母校為歡迎歐陽藻學長回國講學，定於十月十八日下午四時假臺北市西寧北路六號舉行茶會，由母校主辦。
 9. 王孝思、孫源楷兩學長先後逝世，本會由徐前院長承煥學長，鍾常務理事皎光學長，分別率在台各學長參加公祭。
 10. 費驊學長、王章清學長、宋家治學長，張祖璿學長，方開啓學長榮任新職，本會已分別馳電道賀。
- 三、會計主任幹事報告(見附表)