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We needn't feel <sup>especially</sup> sorry for  
the inventor <sup>especially</sup> --- he is as  
responsible as any of us, on the  
average, that we do not have good  
govt., & there is no natural  
right anyone has to enjoy the  
fruits of good govt. w/o  
contributing to it. We  
should feel sorry for ourselves,  
rather -- for we suffer, too,  
that inventions are stifled,  
creativity is wasted.



Info. - when exchanged,  
no one loses, or even sacrifices  
what he has. Thus very  
productive

My involved patent scheme ~~is~~ not so good as simply fixing royalty for patent as small % of income from it, requiring all comers be allowed to use it.



1. Real skills need no patents.
2. In society of <sup>no taxes</sup> no exchange patent would be of no value except as it might be sold.  
Then it would bring its whole ability to increase production minus labor needed to build machine.
  - a. The reason so many inventions today fall into hands of non-inventors is because of difficulty of getting at land.
  - b. Steinmetz is paid invention money, G.E. gets patent money. (is this true?)
  - c. Under single tax, patent wouldn't do any good anyway. value of land under patent would rise, other land wouldn't.
  - d. Distinction between inventions & improvements difficult.
  - e. Under single tax, invention gives owner advantage till others catch on & catch up, ~~raising tax~~, not raising tax, for marginal productiveness goes up too. Thus it gives him temporary relative advantage, permanent absolute advantage. Advantage will then be averaged with all, <sup>no</sup> permanent advantage.
  - f. But it might be said that competition in his field will become greater.
  - g. It's true that prices will go down,



The labor going into inventions must be estimated and rewarded. How? By free market competition, of course. How again?

One would think that under free conditions this would regulate itself.

It would - if there were little return for invention few would invent.

Patents artificially increase return to inventors like most artificial government grants, have bad results like monop.

~~Ball Game~~  
~~Thurs~~



## TNEC Monograph 31, Patents & free enterprise.

Chap 2 1331, first 'letters patent' were simply king's protection to Flemish artisans. ~~Not~~ Not monop. Under Henrys 6-7-8 & Eliz, developed into small monop. A fight, between old guild monop & upstart royal 'letters patent'. These were not for inventors, but gave monop to favorites in various manufactures, for a price. Patentes given police powers. Darcy raided Allen, sued him. Coke ~~of~~ ~~the~~ outlamed patents in case - Eliz having chosen courts over Pmt for decision. Meantime James I to throne, sensed feeling, outlamed patents. But mercantilism, nat. defense, coming to fore. Milit. monop. James I restored monop. 1624, Pmt Statute of Monop. king's monop illegal. Guild monop ok. Charles I ignored. But this statute authorized 14 yr monop to inventor - long enough to teach 2 apprentices.

'Letters patent' to colonial co.s were really delegations of sovereignty - as were invention monop, because policed by patentes. Private police used for other monop too - church, guilds, medics.

Colonies, esp. NE & piedmont, rebellious. Setup own patent for invention system. Patents conditional often - S.C. requiring use to all applicants. Most patents not for inv. but the many nat. monop found in crude xport land. - mills, bridges etc. To encourage capital. Term left open, 1837 decision finally determined revokability.

We could change to a bounty system without changing const. by buying rights & giving to public. Const. envisioned such possibility. Congress chose patents because cheaper. Copyright parallel treatment.

Writing & inventing are useful labor to which <sup>free</sup> economy gives no reward comparable to labor. But we can consider results of this work private prop. & imitation stealing. etc.

For a time states patented also, usage came to be of humors, no law



Patents, cont.

Jefferson ~~1840~~ 1790, Patent Statute, Secys of State, War & Atty Gen auth to issue patents. Jeff. only issued them for high degree of ingenuity etc. Was amazed by flood of them. 1793, new statute, anything patentable. - old machines used in new ways, etc. Give govt power to grant monop & you invite abuse. What is line between invention & not? Patent provides just one line, bounties graduations. Usefulness of inv, difficulty of it must be reconciled in rewarding. \* A patent on something very useful & very obvious over-rewards. Patents never under-reward. & what of labor of indep inventor who is a day later?

1836, patents had become worthless - you simply had to register anything you considered patentable. Floods of lawsuits. Legit. patents <sup>nor others</sup> not protected, for any minor change worth a new patent. 1836 law revised examination. No basic changes since, just development. Growth of caste of examiners & attorneys, & 'a tradition', the Patent Office.

Chap 3 - 1797, Newbold's iron plan in U.S. Jefferson's moldboard. Jeff backed, used by 1830.

Whitney's patent pirated in south - simple to copy gin. His suits in vain.

How about giving inventor monop for limited area only? Then, if patent is successful financially (& most will not be, probly) it will be copied in other areas. Then consumers in patented area suffer. But at this point the value is proven, inventor may be <sup>bountied</sup> ~~subsidized~~ by giving him the ~~difference~~ capitalized value of his monop, determined by comparison of his price-cost difference with competitive rates found elsewhere. This is fair to inventor, fair to other inventors, ~~fair~~ treats all public alike. If we just give universal patent & wait for him to prove it a good patent by using it, & then buy it, we allow holding idle, stop other



inventors. Constitutionally this could be arranged by just letting states issue patents. Of course then everyone would take out NY patents, etc. ~~Can~~ Still, there are just administr. difficulties.

F Clipper ships had been developed with no patents. <sup>- see S.E. Morison, Maritime Revol. Mass.</sup>  
1824, in Gibbons vs Ogden, <sup>licensee of Fulton</sup> Marshall broke Fulton's rights to exclusive use of Hudson R, given in lieu of patent. Then steamboats improved rapidly, without patents.

F Gallatin, 1813, attributed slow growth of manuf. to high wages, lack of cap. (high int, i.e.), abundant land, agrarian culture. 1804, only 4 cotton factories in country. 1840, 1200. 1814 power loom invention, Nap war. Waterpower. 1835, spinning wheel & hand loom still produce as much as factories. Lowell, Lawrence, Fall R, Cohoes, Holyoke, Patterson. Iron, liquor, leather. <sup>(Lawrence not founded until 1846, - B&M, ch. 2)</sup>

Iron demand increased by new inventions.

1849, for first time, annual no. patents exceeded 1,000. - kept going up. Cheap iron important - charcoal technology finally overcome about this time.

When developing an exposition in writing, you develop an environment for the point, which many writers fail to distinguish from the point itself. Watch that.

Eastman Kodak brought unjustified infringement suits, starting by gaining preliminary injunction which endured long suits, thus gaining ends. United Shoe brought unlimited suits,  $\frac{3}{4}$  unsuccessful, only object to exhaust defendants, & it worked. Law must be simplified, cheapened.

## Chap. 9 - A policy for the national economy

See Chap 6, Lyon-Warrens-Abramson, summary of recommendations.

Slight tax would bar a host of petty gadgets that now embarrass the office, allow attention to important considerations. The true novelty



must be distinguished from the spurious. How? Arbitrary. But high standards should doubtless be maintained.

Purchasers of infringing products are liable. This should be changed.

Pools & cross-licensing are to combine patents. Our buying out system would dispense with this problem, but before buying out it might arise in patent area.

G We could enforce use without regional device by saying after 3 yrs. govt would buy out patent at whatever its value proved to be. If not used, no value. But the expanding market would be hard to evaluate.

If the smuggling from non patent areas becomes acute, buy him out sooner; at his option.

Single patent court recommended.

F Basic research mostly now by govt & univ. labs. <sup>& foundation</sup> ~~that~~ Inst. holds patents, often for financial gain. But patent financial gain not basis of this institutional research. But does he not underemphasize indst. research?

Industrial research is not to invent so much, but to solve given problems, arising in competition. These would arise anyway, trying to reduce costs, get jump on competition, etc.

Desiderata are to reward inventor properly, & get wide quick use of invention. My system does both.

Who gets patent? That's up to individuals, not law, for coop. invention.

G As long as we are going to charge a slight fee to stop idle patents, make it a periodic fee, to encourage use still more.

3 classes of patentability: individual insight, new principle; derivative processes worked out by professional staffs; variations on a basic design - mechanical improvements. Only first should be patentable he says.

Between various industries we have large variations in return on cap. Does it not follow that cap. inertia is enough so



● AUTHOR

Editors of

**Fortune Magazine**

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## **THE MIGHTY FORCE OF RESEARCH**

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Here, for the intelligent layman, is a survey of the men and organizations involved in scientific research, how it is being done, what is being accomplished, and how the research is influencing and benefiting our everyday lives. Ten chapters of the book are devoted to the objects and fruits of research—showing how research and the men behind it are producing new scientific discoveries in weather, the human brain, chemicals for agriculture, peacetime atomic energy, electronics and automation.

(over)

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**FORTUNE MAGAZINE — The Mighty Force of Research**

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## DISCOURAGED INVENTORS.

To the Editors: A vital point overlooked by the article, "The Decline of Invention" in your paper is that patentable ideas come from the mind of individuals, not companies or large human organizations. Thus, contrary to what this article assumes, it is the relationship between the individual inventor and the business or government organization which is even more important. Most companies today in the U. S. require that their employees give their ideas to them with no compensation. A very few have recently granted 15 per cent of gross royalties to the individual inventor, or thereabouts.

Even here at State College I find in a paper, "The University of North Carolina Patent Policy and Procedure," an interesting statement about members of the University staff and inventions or discoveries they may make on University time or utilizing University facilities or materials. Such an inventor must discuss his invention with his college superiors and if it seems it should be considered for a patent, the matter must be passed on to the business manager with a request that it be considered by the Faculty Patent Committee. If the committee decides it is one in which the University has no interest, the inventor will be free to dispose of it as he sees fit. Otherwise the inventor will be requested to assign his invention to the University Research Corporation.

Most inventors today get only a smile from the boss and so that is about what patents are worth these days.

CHARLES D. LUCAS  
N. C. State College.

John Wheeler Moore  
of Murfreesboro compiled  
"The Roster" of North  
Confederate troops,  
a two-volume his-  
tory of the state, and a novel.

Colonel John H.  
Moore was a Murfreesboro native  
and one of the first historians  
of North Carolina in the  
Confederate era.





C. M. Hall had 19 yrs on Alum., -PLC

rewards of prior entrance are enough to pay for ~~ex~~ development by prof. staffs & mechanics of new ideas?

F

17 years now our period. Rapidity of technology now means they expire only after they are obsolete, so we never have freedom. & in a system of private land, 17 yrs is long enough to start a real monopolist.

Patent monopol used universally to defend monopol actions ~~and~~ vs. anti-trust. 'Common carrier' treatment would prevent.

If we make it compulsory to license, & require that licensee's produce what they will, the license is of no value, we have revoked the patent. Yet this is exactly what author (Walter Hamilton) proposes.

Patentee may now license people & restrict area.

Guy has broken down patent restrictions on production for Guy, observes restrictions on other markets (1941).

~~As~~ Inventions 'create' resources.



TNEC monograph 31, Patents & free enterprise.

Hartford - Empire glass, heads glass container combine. Market divided, etc. Patents the basis. Expensive lawsuits keep out small fry. Dual process of amalgamation & extermination. Here patents keep it going, while with Alcoa they just started it, and keeps it going.

Melders says more objections to & delicate feeling about TNEC patent investigations than any other of their inquiries into concentration & monop.

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The garret inventor, the garage tinkerer, and the backyard genius seem outmoded today in a world of enormous laboratories and expensive equipment. But how well are we doing without their virtues of independence and imagination, and can we make "research" pay off?

# Get a Good Scientist

## *. . . and Let Him Alone*

Leonard Engel

**B**Y ALL outward signs, American science is in an unprecedentedly good state of health. Funds, physical facilities, and personnel for research are greater than ever; the journals that report results are fatter and more numerous. A number of able scientists, however, are made distinctly uncomfortable by some aspects of this boom. They fear—and with reason, I think—that American science is developing in a way dangerous to the imagination and ingenuity which alone can make it fruitful.

In recent years American science has been overworking one of its techniques—the pre-planned study with a precisely specified goal, passed on by an advisory board or committee. Sometimes it is carried out by a single individual but more often by a large group of researchers working together. They may aim either at the solution of a particular problem or a study of some natural phenomenon, but the important thing in either case is that both goal and research plan are fixed in advance.

In recent years the nonscientific public has become more and more appreciative of this weapon in science's arsenal. Especially during World War II, the armed forces, industry, and the voters learned—through the atom bomb and lesser achievements—that scientific research had in the preplanned study a marvelous device for answering all kinds of pressing questions. It could determine the best

shape for children's-shoes or even find, at astonishingly short notice, a host of synthetic antimalarial drugs to take the place of quinine. It could cut waste motion and focus attention squarely on the problem at hand. It could open the road into the technological Utopia everyone expected science to create. Yet planned research has a disconcerting way of suppressing everything not included in the plan; and it could also narrow the opportunity for talented individuals, for really new ideas, and for the exploitation of the unexpected.

The decisive element in the whole history of science has hitherto been the gifted individual with a truly new idea or the insight to see significance in a chance observation. Before there could be research in nuclear physics, there had to be an Einstein; before the microbiologists who systematically seek out new antibiotics, there had to be a Fleming and a Dubos; before the jet-engine laboratories in which thousands of "development engineers" toil, there had to be Frank Whittle. Thus what Professor Harold Willis Dodds of Princeton calls "projectitis"—which lengthens the odds against the unusual talent, the novel idea, and the unexpected observation—may be killing the goose that lays the golden eggs. Already a number of authorities feel that, considering the effort expended, fewer really new discoveries have been made in their fields in recent years than could have been expected.



### The Disease Spreads

UNHAPPILY, projectitis is not on the decline. Twenty years ago, most papers in publications like the *Journal of the American Chemical Society* carried only one or two names and authors, and in a fair number of cases they represented the ideas of no one but those who signed them. Today nearly all the papers in the *Journal*—and in most other journals of original research—bear some mark of the project. A large percentage are signed by “teams” of anywhere from three to a dozen authors. Others have the telltale introductory note with a contract number or a line indicating that the present study is but part of a larger program.

Several circumstances are responsible for the projectitis epidemic. To begin with, scientific equipment has become highly complex and staggeringly expensive. I recently visited a small laboratory in New Jersey equipped for routine studies of blood and tissue. There was easily \$100,000 worth of gear in the place. Devices like the research ultra-centrifuge and the mass spectrometer may cost tens of thousands of dollars apiece; atom smashers run into the millions. The heads of laboratories with such equipment react just the way manufacturers with heavy plant investments do: they want to see their expensive machinery employed around the clock. Accordingly they encourage elaborate projects—the more elaborate the better.

Another unavoidable factor in the spread of the large project is the increasing specialization of scientific work. Studying the biological effects of hormones on the body, for example, requires techniques that take an educational lifetime to learn. Exact chemical identification of the hormone substances involved demands other, equally difficult techniques. The only solution, then, for a comprehensive hormone investigation, or any similar undertaking, is a joint enterprise of many scientists with different skills.

The main drive toward projectitis, however, has come from a radical change in the financing of research. Before the war, research was mainly a university affair. There were a number of important government and industrial laboratories, but an overwhelming proportion of the most significant research was conducted in universities—and largely

financed by them. During the war decade, however, inflation and the rising cost of research made it increasingly impossible for the universities to continue their work without outside help, and lots of it.

Though thousands of new government and industrial laboratories sprang up, in fields ranging from atomic energy and electronics to pharmaceuticals, and though prewar laboratories like the General Electric center at Schenectady grew to mammoth size, there were many research problems that could not be dealt with adequately or economically in such establishments. The universities had—and still have—an unparalleled concentration of scientific skills, and so government and industry alike returned to them for help. In addition, agencies like the American Cancer Society and the National Foundation for Infantile Paralysis were raising sizable sums for research in their various fields, and universities were the logical place to spend them. University research was thus able to continue and expand—at the price of projectitis.

ORGANIZATIONS like the Rockefeller Foundation have long made grants to universities for research, but there is a crucial difference between these institutions and the new dispensers of funds. The Rockefeller agency is primarily interested in stimulating the growth of science. Though it has aided some specific projects, it usually gives funds to a talented researcher without questions as to how he plans to use them. The new fund dispensers, on the other hand, are primarily “buyers” of research. The Atomic Energy Commission and its board of supervisors, the Congress of the United States, hope to obtain information that will lead to improved atomic weapons or contribute in some other way to the atomic energy program. The American Cancer Society is buying a cure for cancer. And so on.

A good many of the administrators of the new fund-dispensing agencies know that, in science, the longest way round is frequently the shortest way home. The Navy Department's Office of Naval Research, for example, has made large grants for research on phenomena in the neighborhood of absolute zero (−459.6 degrees Fahrenheit), although practical applications still seem pretty remote. And the American Cancer Society supports



work only indirectly related to cancer, on the sound theory that this is at least as likely to lead to more effective means of dealing with cancer as a direct attack on the disease.

The difficulty is that the new fund dispensers behave as buyers even when they sponsor such broad programs of investigation. Like buyers everywhere, they want to be sure of their money's worth. So they seize on the one tangible in the situation—what the researcher proposes to do with the money. The researcher who asks for a grant is forced to spell out in advance just what he hopes to learn, what experiments he thinks are necessary, and exactly how they will be performed. In short, the fund dispensers demand prefabricated projects.

CURIOUSLY, eminent scientists themselves, who certainly know better, are among the worst offenders. Nearly all the large grant-making agencies turn the actual selection of recipients over to advisory committees drawn from the top echelons of the scientific community—often from the expert panels of the National Research Council. With certain exceptions, these scientists have proved as quick as anyone to show an excess of caution in allotting funds and to tie down other scientists of even recognized ability in a mass of preplanned detail.

In a recent issue of *Science*, Professor Curt P. Richter of the Johns Hopkins Medical School, a veteran of two decades on grant committees, tells how the committees function. Before World War II, he writes, when a scientist applied for a research grant "a few lines or at most a paragraph or two sufficed for the experimental design." Now this one part of the application "may extend over six to eight single-spaced typewritten pages. And even then committee members may come back to ask for more details."

The other day I saw an application for a grant, not from an unknown but from a man with three major discoveries to his credit, which ran to thirty-nine single-spaced pages by the time he had supplied all the details members of the grant committee demanded. He was actually required to specify the chemical analyses he meant to employ, although analytical techniques are advancing so rapidly in his field that those he specified are almost certain to be outdated before the project is completed.

### *The Damage It Does*

THE spread of projectitis through American science has had a number of disturbing results, one of which is to encourage a kind of mass deception on the part of scientists. A young bacteriologist on the staff of a New York hospital recently became interested in studying how a widely used antibiotic achieved its curative effects. He was able to get a grant from one of the agencies in the cancer field by contending that his study might lead to an anti-cancer antibiotic, although he himself believed the possibility was practically nil.

Another curious result is the buying by some laboratories of unneeded equipment, rather than returning unused portions of their grants. Still another is the project-that-leads-to-a-project; to assure themselves of a continuing supply of funds, smart researchers pick out projects sure to lead to questions that can be settled only by further projects. This is the practice, increasingly familiar in the humanities as well as the sciences, that sociologist David Riesman of the University of Chicago calls "academic check-kiting."

But the real objection to the project system is that, when carried too far, it becomes a bar to the progress it purports to serve. Research workers are reduced to the status of technicians. New ideas are blocked. The solutions found for many problems are more apparent than real; they often take the form of gadgets and technological gimcracks that create difficulties as great as or greater than those they were supposed to overcome.

A plan of research inevitably mirrors the attitudes and information of the people who draw it up. When it is refined and re-refined by a committee, it is reduced to the common denominator of that committee's views and beliefs. Consequently, in the area of basic research—that is, the study of natural phenomena without an immediate application in view—planned research often serves merely to confirm what is already known or strongly suspected, or to fill in obvious gaps in knowledge; while planned attacks on "practical" problems tend to start out from existing knowledge and proceed along strictly conventional lines.

Few great discoveries were made, or could have been made, by sticking close to what was



known, reasonable, or to be expected—in other words, by proceeding according to plan. Even the most “inevitable” have had an unexpected, unplannable element. The development of penicillin, for instance, is usually cited as a “planned” discovery. The development was indeed most carefully and ingeniously planned, from Chain and Florey's extraction and trial of a small amount in 1939 to mass production in 1945. But one element was not and could not have been planned: the alertness of a British bacteriologist named Alexander Fleming that led him to notice, fourteen years before, a clear spot in a culture dish left on a window sill. He studied the spot and found it was made by a common mold, *Penicillium notatum*, which secreted a substance that had destroyed nearby bacteria. Similar accidents must have occurred repeatedly in countless laboratories before and since Fleming, but no one else had noticed or followed them up. Without Fleming, there could have been no plan for the development of penicillin.

A GOOD many other outstanding discoveries have resulted from what Dr. Alan Gregg of the Rockefeller Foundation calls “puzzlement”—a state of bafflement and uncertainty over discrepancies in the “known” facts, a feeling not easily tailored into a project. It was a feeling of this sort over the famous Michelson-Morley “ether drift” experiments that led Albert Einstein to the special theory of relativity; and another dissatisfaction, this time over the distinction in Newtonian physics between inertia and gravitation, that finally brought Einstein to the general theory of relativity and the revolutionary conception of gravitation as a property of space-time instead of force.

Still other great discoveries have been the result of sudden flashes of insight or the willingness of a man to stick with an idea, however wrong or odd his colleagues might think him. Several of the discoveries of the great French mathematician Henri Poincaré came to him at odd moments—for instance, as he climbed aboard a bus—after weeks or months in which he found himself unable even to formulate the questions involved. And Otto Loewi's historic experiment proving that a chemical substance is discharged when a nerve impulse passes from one nerve fiber to another

—which won him the Nobel prize—came to him in a dream.

IT is, of course, impossible to gauge how much we are losing by casting research into a project mold. Discoveries have a way of remaining unknowable until they are discovered. Still there are signs that we are missing discoveries of importance—perhaps of the greatest importance.

In the fall of 1953, fourteen antibiotics were available for the treatment of disease or undergoing trial in the clinic. Nine of them are derived from a single family of molds, *Streptomyces*. Is this because *Streptomyces* have a near-monopoly on the production of useful antibiotic substances? Or is it because several of the early ones happened to be from *Streptomyces* and so pharmaceutical research projects have focused on this family ever since?

In a recent book, T. K. Quinn, a former vice president of General Electric, points out that the only household appliance that ever originated in the laboratories of the big electrical companies is the electric garbage grinder. The fan, the refrigerator, the washing machine, the dishwasher, the toaster, the electric iron, and all the rest started in smaller companies or in someone's barn. Is it because the men who work for big electrical companies are dull, or because (as Quinn suggests) “private monopoly” isn't interested in being original, or is it because (as I suspect) their laboratories work almost exclusively on projects?

The aviation writer Wolfgang Langewiesche has called attention to an equally disconcerting situation in aeronautics. During the past decade and a half, there have been several important innovations in aircraft, such as the tricycle landing gear and the jet engine. Not one of them came out of the huge, astronomically expensive air research program financed and managed by the United States government. The program, Langewiesche says, has made airplanes bigger, fuller of gadgets, and much more expensive—but not really better. It has yet to produce a fighter plane more effective than the much simpler Russian Mig. Langewiesche blames government red tape. I suspect projectitis, a disease that seems to be becoming universal.

I hope that what I am saying will not be



taken to imply that there is no place at all in science for projects and planned research. There is—in taking an idea from the laboratory to the stage of practical use, and in certain other research problems. But even applied research cannot be completely pre-planned—a point nicely underscored in the possibly true story of the Russian laboratory director and the visiting English scientist. The Englishman asked how the Russian laboratory managed to fulfill its plan 100 per cent year after year. “It’s not difficult at all,” the Russian replied. “In 1952 we see what we did in 1951 and write that down as the plan for 1953.”

### *The Way to Cure It*

THE real question is how to retain the advantages of the project without closing the door to new ideas or observations. The solution is surprisingly simple. Research institutions (especially universities) should hire fewer people for specified undertakings, and more simply because they are bright. Grant-making and research-contracting agencies should ask fewer questions about projects and more about the researcher’s intelligence, imagination, and integrity. As grant-making committees ask more questions about experimental design, they inevitably ask fewer about people. In recent years, comments Professor Richter, the man behind the project has become a dim, shadowy figure; few committee members ask about him. This trend should be reversed. People and their potentialities are, of course, less tangible than projects. Mistakes will be made that will make the research administra-

tor unhappy. But the uncovering of a single genuine talent is worth many mistakes.

A number of institutions and grant-making agencies have operated for years and still operate in this way. One is Harvard University, which has just won its sixth Nobel prize—more than any other institution in the world. Another is the Rockefeller Institute for Medical Research, whose staff members have won four Nobel prizes—an equally remarkable record, considering that the Rockefeller Institute is much smaller and works in a more limited field than Harvard. A third is the Rockefeller Foundation, the Rockefeller grant-making agency that asks questions about brains, not plans. A clear majority of the men who received Rockefeller fellowships a decade or more ago have since made outstanding scientific contributions and become eminent in their fields.

The system of hiring a good man and letting him alone can be recommended for at least part of their work even to industrial laboratories, in which the project approach is often necessary. Three manufacturing firms in the United States have for some time made a particular point of getting good research people and giving them a free rein: Merck & Company, Eastman Kodak, and the Bell Telephone Laboratories. Merck men came up with the first practicable procedure for manufacturing cortisone; Kodak has made many far-reaching contributions to photography and related branches of chemistry; and Bell Laboratories produced the transistor, the revolutionary successor to the vacuum tube which will gain the telephone company more than any hundred “planned” projects one might care to name.

### *Anyhow, We Invented Chlorophyll . . .*

EVERY liquor dealer and barman personally knows, in varying degree, of the growing popularity of vodka. In the past few years it has risen from nowhere to a leading place in Pacific Coast sales. Production of vodka in January 1953 was almost ten times larger than it was in the same month of 1952. . . . Every city, every state is reporting bigger and better sales. Why? . . . The answer can be told in one word—*discovery*. The public is discovering the unique qualities of vodka and spreading the word. They have learned that the odor of vodka can hardly be detected on the breath. . . .

—From *Beverage Market Guide*, June 1953.



Maybe it wasn't heroic—but Philip had been taught that a good soldier should take advantage of the terrain.

## The Easy Way Out

*Robert Berkowitz*

PHILIP was a veteran of World War II and a senior at an Eastern university when the Korean war broke out. He was also beginning the last year of an advanced infantry ROTC course. He had no particular desire to be an officer, but advanced ROTC cadets receive about \$30 a month, and this supplemented his GI-Bill checks. The Korean war, however, frightened and depressed him. The younger students faced the draft anyway, but he had served in one war and this time he wanted out.

Though the few other veterans in his ROTC class generally agreed with him, all cadets had signed a contract to finish their course or repay several hundred dollars in uniform and subsistence allowances. None had the money. Theoretically it was possible to be flunked out or to be dropped as unsuitable. With some others, he decided to try. He ceased to study; he began cutting weekly drill and showing up late to class. This got him nowhere; according to the semester grades, absence seemed to improve some students.

At the beginning of the next semester, loyalty forms were passed out for signatures. Philip could have signed the loyalty oath without question, of course, but on the list of subversive organizations was one which had sponsored a public meeting he'd attended—perhaps more than one. That was ten years before; Philip had been seventeen. He couldn't remember much about it except that he'd gone to the meeting in prurient and unsatisfactory pursuit of a girl whose name he'd since forgotten. Genuinely uncertain, he went to the Professor of Military Science and Tactics, a Regular Army Colonel commanding the ROTC unit.

The Colonel was stunned. Under his questioning, Philip went back over the entire list. He hadn't belonged to the Black Dragon Society, nor to the German American Bund, nor to the overseas branch of the NSDAP

(Nazi party). But other names seemed vaguely familiar. There were Socialist groups, Trotskyite groups, anti-Fascist committees of this and that; he couldn't know what he'd signed in the years before military service interrupted his college career, when he'd been on all kinds of mailing lists. Scrupulously, he admitted this and noted each name which seemed familiar. He had been to see "Alexander Nevsky" at Harvard in 1947; he didn't remember if it was sponsored by American Youth for Democracy (subversive) or by the Liberal Union (non-subversive). On a visit to New York he had attended a showing of the film "Potemkin." Though he couldn't remember if he'd made any other accidental contacts he knew in his own heart he was loyal. Would the Colonel help him? The Colonel took copious notes and said he would.

HE DID. A few weeks before the end of the semester, Philip was notified that he had been dropped without prejudice from ROTC. He made no appeal. He collected his check and said good-by. The class was commissioned and called up; most of them served in Korea.

Philip feels a little guilty about dropping out of ROTC, since another cadet who had a similar record was less successful in calling it to the Army's attention; Philip was the only one who got away with it. He knows now that it was the Liberal Union that put on "Alexander Nevsky," but if he made other such errors—and he doesn't think so—they were honest errors. All he'd done, in a sense, was to smear himself, quietly, judiciously. He still considers himself a normally patriotic citizen, and he calmly points out that it was the Army, after all, which made the decision. He was willing, or at any rate prepared, to serve his country. He still considers himself just as loyal as, say, the Colonel who commanded the ROTC detachment. Maybe a trifle smarter.



Guenter Reimann, "Patents for Hitler", NY: Vanguard Press, 1942

p. 51 Agreements of Standard & IG were, in general, to keep IG out of oil & gas; & keep Standard out of chemicals, other. IG seemed to get the better of it.

"When this pact was signed the oil industry was already firmly established. Its huge investments had to be protected against the undue depreciation that might be caused by new competition or declining prices and overproduction. The chemical industries, on the other hand, were still more or less a thing of the future. "

SO left Gy to IG, both oil & chemicals; but IG got American chemicals.

p. 52 IG promised SO ~~xxx~~ to share new technical data, but never did.

IG was "pvt" corp., but dominated by state, acting as agent for state -- like old Eng. chartered co.s?

p. 86 IG executives cabled instructions to SO in NY instructing re patent agreements, during lend-lease pd.

p. 90. In the war, IG patents, some ~~20~~ 2,000, were opened up. -- despite SO's part interest. p. 95: IG turned many joint patents over to SO, SO agreeing to give income to IG, eventually.

p. 115 Technological advance would have put oil co.s into chemicals, & v.v. Object of agreements was to split mkts, keep each outfit in its place.

SO, at beginning of war, announced it had refining capacity to meet all aviation gas needs. But didn't. Finally, I judge, others built up their refining capacity. Hence postwar prosperity.

p. 207 Same with Alcoa. Said it could meet all demands, at war's beginning. Couldn't.

208-9 Since 1928, Italy was getting aluminum from ores cheaper than bauxite, via the Haglund patents. Gy, Japan, used this method. Alcoa kept it from U.S., paying potential competitor fancy figure not to produce -- says Thurman Arnold, before the Patents Committee. Because Alcoa feared losing value of its bauxite holdings.

Again, p. 214, Alcoa held up magnesium price & output, because "Alcoa feared that its investments in aluminum would suffer from competition with magnesium" Note it is the investments -- the landholdings -- not just the current output. Modern ec. theory leaves this out.

1934, International Patent Convention, 45 nations agreed on international patent reciprocity. All industrial countries joined. But the equality the Nazis gave was just to treat Americans like they treated Germans; while we treated Germans like we treated Americans, much better, less control, more room for restriction etc. 258



259 Never did an American patent stop German production. But many German patents stopped American production. That was part of the "azi plan. Esp., perhaps, to stop American aircraft production. (Or perhaps their restrictions just came out in materials needed for aircraft, because of investigations there?

When (p. 272) one large co. holds basic patents, or umbrella patents (vague ones), & licenses out patents also to others, those others do little complementary development of "know-how", because that would just help the original holder. In war, thru "consent decrees", such know how, which was monopolized along with patents, had to be spread around. Postwar, the patents might be withdrawn; but not the knowhow.

p. 294 Mnpies with high incomes, but don't want to reinvest in their own business. (hence go into other businesses; or buy land)

pp 298-301 Much on how new inventions are rejected by vesteds, & intrenched business bureaucrats -- most of the great ones.

A remarkable book. Much more in it.



Leg: T.K. Quinn, former v.p. of G.E., recent book,  
says most household appliances did not originate  
in big research labs, but someone's barn.

Cited in Harpers, Jan 54, p 58



## Patents:

Could use same system anti-monop. as with land value: license to produce has yearly value, either assessed, or from auctioning of licenses each year. So any monop. causes rise of auction value, no gain.

But in order for licenses to have any value, must restrict them. Land is restricted by nature, we cannot help that. Licenses are not, & why restrict them? To reward inventor, must give him something to sell, license is it. If he can sell any no., if he must sell any no., they have no value. So he will limit.

Ideally, should make idea public, anyone can use it, his machines are used until costs rise & prices fall ...

License should be for machines used, not for no. of things produced by them. If is for no. of the invention used, payment for it is like land rent; if for no. of things produced, is like tax on production. But neither is good: fee for each machine used encourages you to economize on using them, for no good reason.

Fee should not be that you pay for license, then can produce any no. This gives premium to big firm. Encourages monop. control: for one firm, paying for license, could then subcontract the work, only one license need ever be bought by anyone.

The license fee for using machines would have a function: for if the user just buys patented item, he is not paying its full cost: inventor's cost. And if inventor's were socially subsidized in such a way as not to be reflected in those costs, inventions would be economical which were not truly so, when cost of inventor figured in.

Except that most inventions will create some rents. Here is argument for socially subsidizing inventor, then giving his work free to all users. Let society pay inventor something -- something like the rent he creates. Figure how much price falls due to him, & Q expands, etc.

Probably individual who produces patented item should pay license; not those who later use it in production. (It might be cons. good, then certainly must be producers who pay)



BIOGRAPHY OF THE MAN WHO FIRST INVENTED

# The Oil Burning TOBACCO CURER

2-21-55  
suppl. p. 26



FORREST H. SMITH

By Talmage C. Johnson and  
Charles Robert Holloman

## FROM THE STORY KINSTON & LENOIR COUNTY

The Apostle Paul described himself in these words: "I know both how to be abased, and I know how to be abound; everywhere and in all things I am instructed both to be full and to be hungry, both to abound and to suffer need." It was that sort of man that Rudyard Kipling had in mind when he wrote, "If you can meet with triumph and disaster, and treat these two imposters just the same." And Forrest H. Smith is that sort of man.

Mr. Smith has had a varied and a checkered career. He has experienced both failure and success, both poverty and wealth. But, in all of his experiences, he has consistently and constantly retained two qualities: a rigid personal honesty and a profound faith in himself, in his fellowmen, and in God. It was these qualities which accounted for one of the most unusual and remarkable business developments which ever occurred in Kinston and Lenoir County. During the World War II days, when the materials from which he manufactured oil heating tobacco curers were almost impossible to obtain, Smith never gave up his efforts to obtain priority for materials until he finally succeeded. But he was then completely broke and had no money with which to buy the materials or to pay workmen to make the burners. He simply announced to the public that he was ready to start production and would accept orders with cash in advance. Lines formed a block long to deposit with him monies for burners yet to be built. Such a demonstration of confidence in a man's integrity is rare, but in this case it was thoroughly justified. Mr. Smith deposited the money and used it only for necessary materials and labor until he had filled every order promptly. He was back in business again, and ever since he has experienced growing success.

Forrest Smith is the inventor of the first successful oil burning tobacco curer, and there are those who say that it is still the best such curer on the market. What this has meant to the tobacco growers of eastern North Carolina and other areas is inestimable, for it has made it possible for farmers who must work hard during the days to get their needed sleep at night. Mr. Smith, as a farm boy, had spent many a night curing tobacco by the old wood burning method; he knew the need and fortunately he had the inventive genius to meet the need.

Over a five year period, beginning in 1929, he invented and developed the first successful oil heating system produced in the entire world.

Mr. Smith was born in Duplin County, the son of A. J. and Carolyn Smith. He had one brother, Jones Smith, who now operates a store near Pink Hill. He grew up on the farm, attended the public schools and then went to Trinity Park School. He also attended for a time the Rhodes Military Academy in Kinston. He married Miss Margaret P. Davis of Kinston. Their children are: Hildred, an accountant, is employed by the H-Bomb Plant in Augusta, Ga.; Carolyn, now Mrs. Joe Duncan, of Atlanta, Ga.; Frederick, an industrial engineer, is employed by the H-Bomb Plant in Augusta, Ga.; and Margaret, now Mrs. Robert W. Belfit, of Philadelphia, Pa.

As a young man, Mr. Smith for a period of about three years engaged in the retail furniture business in Richmond, Va. Afterwards he came to Kinston and opened a furniture store where the post office now stands. He later operated for about seven years a music store, sometimes selling as many as a hundred pianos in a year. He built the first trailer ever pulled in this area and hauled pianos on it.

Mr. Smith then turned to the hotel business. He leased both the Tull Hotel and the Caswell Hotel from Joel Stephenson. When his lease ran out on the latter, he continued to operate the Tull Hotel. At times he leased other hotels from Luray, Virginia, to Miami Beach, Florida. There were times when he was operating three at once. In all, he spent seventeen years in the hotel business.

After leaving the hotel business, Mr. Smith devoted all of his time to his oil heating tobacco curing system. In 1934, he organized the Smith Heating System, Inc., to which he leased his patents. There were six stockholders, but he himself retained controlling interest. In the depression years, the corporation failed as did many others. Also competition developed and he lacked the funds with which to conduct a lengthy legal battle for the protection of his patents. But in 1940, the business was reorganized under its present name, Smith's Heating, Inc. It is a family-owned organization. Forrest H. Smith, the founder, is president and treasurer; J. Frederick Smith, his son, is vice-president; Mrs. Margaret P. Smith, his wife, is secretary.

The first set of burners ever manufactured was sold to F. W. Boswell and was used to cure nineteen crops of tobacco and four crops of sweet potatoes. Since that time, curers have been distributed from Virginia to Florida and in the burley areas of Western North Carolina, Tennessee, and Kentucky. Recently shipments have been made to Colombia and Peru in South America; Korea, Formosa, and Thailand in Asia; and to South Africa.

Smith's Heating, Inc., has expanded and been enlarged throughout the years. Its plant now covers an entire city block with four buildings, two of them containing two floors for a total production space of 23,525 square feet. The firm employs from ten to thirty workers in its seasonal operation.

Mr. Smith joined the Presbyterian Church as a boy and he is now a member of the First Presbyterian Church of Kinston. He is also a member of the Country Club and the Chamber of Commerce. While by no means anti-social, he has not been much of a "joiner," devoting most of his time to his business and his family.

Like many an inventive genius, Mr. Smith has his eccentricities. It is known that the greatest of all American inventors, Thomas A. Edison, slept only four hours out of twenty-four. No one knows how many hours Mr. Smith sleeps, but it is known that the board meetings of his former corporation were always called for three o'clock in the morning because he "felt fresher at that time of the morning than any other time of the day."

**SMITH'S FIRST SET OF CURERS IS NOW ON PERMANENT DISPLAY IN THE ARENA OF THE NORTH CAROLINA STATE FAIR OF RALEIGH, N. C.**



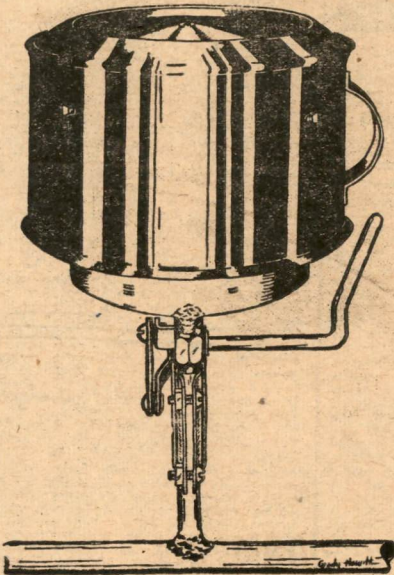
In these spacious, well lighted  
Burning Tobacco C

## 14 REASONS WHY YOU SHOULD G

- 1—Smith's Model "A" Curer distributes the heat more evenly over the barn than any other curer, and it is agreed that the more even the temperature over the floor of the barn the better the tobacco will cure.
- 2—NO FLASH UPS! You can cure with your barn door wide open.
- 3—Five different Models of Oil and Gas Curers to choose from "A," "D," "Utility" and Radiant Heat and "Smith's Champion Gas Curer."
- 4—Smith's Curers are the only ones that can show an official record of using less oil than any other curer on the market.

- 5—The been year of th
- 6—Smith by v mark
- 7—Pric 16'x1
- 8—We i TOB
- 9—Smith galva

### THE SMITH BURNER



The Heart  
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Efficient  
Smith  
Curer  
The  
Largest  
Open  
Flame, By  
Weight  
Used On  
Any  
Tobacco  
Curer

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**MANUFACTURERS OF SMITH'S**

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of va



**42F. REVIEW OF THE AMERICAN PATENT SYSTEM.** Report of the Committee on the Judiciary, United States Senate, 84th Congress, 2d session, made by its Subcommittee on Patents, Trademarks, and Copyrights, pursuant to S. Res. 92 on the American patent system. 1956. 16 p.



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Patents, being ~~ren~~ sold & not rented, also misallocated  
like land. Strong argument for renting them.



Some say only mncs can afford to finance research.

But if I am right that big firms have research more because of cost & politics in legal aspects. then fact is this not argument pro mnc, or bigness; but a reason for it.

If argument were valid, opt size of firms wd also  $\Delta$  from this cause.



Research, too, can be bought from  
specialty producers: Richard Morris's Nat. Research  
Corp.

Besides, biggest pharmaceutical producers - Reckitt --  
are not those who specialize most in original  
research. Squibb, etc. do that.



✓ "The Devil's Chemists"  
Beacon Press, re G. G. Fackler  
DuBois

338.23

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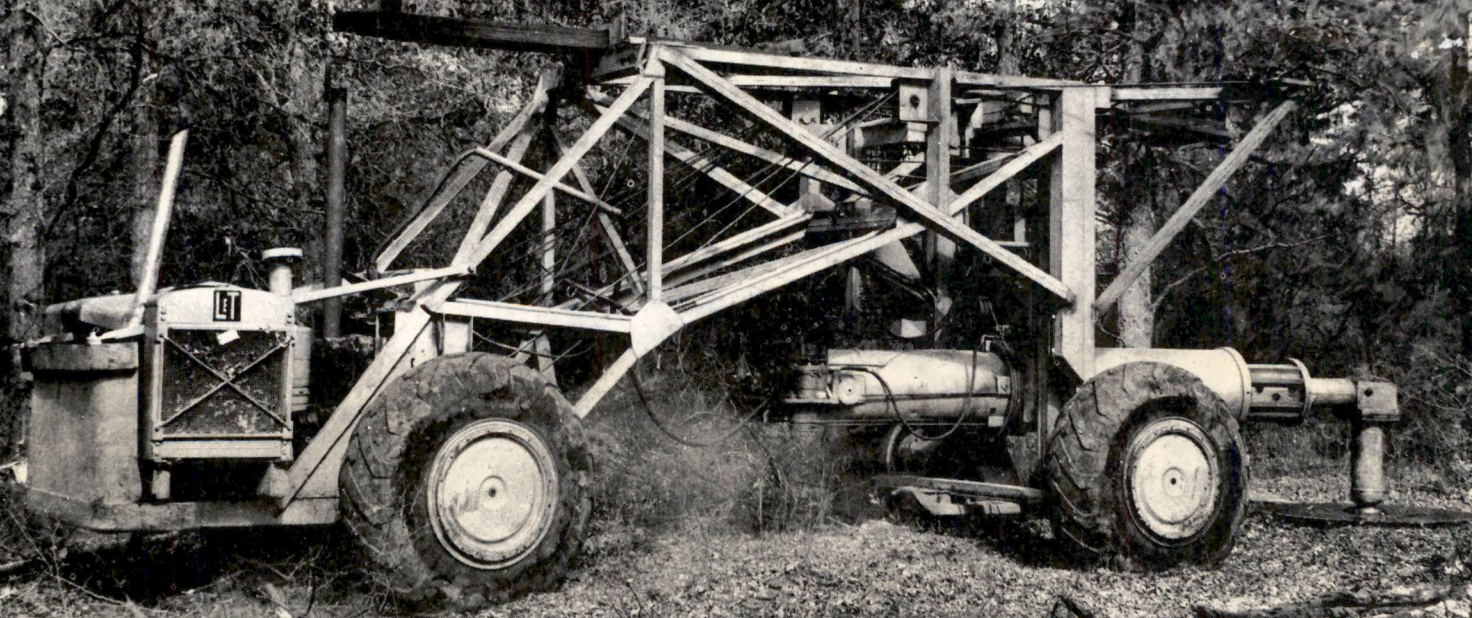


McGraw-Hill Technical

**MOW**

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**TREE SAW**



wrote to the Governor of the State, suggesting that the boy be given a conditional pardon, one condition being that he be sent to the Boy's Ranch at Lindale. The Prosecuting Attorney and the Sheriff joined in the request. Jerry's father and mother each signed an agreement for him to go, and his father put money in the bank to pay his transportation. The Governor granted the pardon on April 26, 1950, and on May 11, Jerry reached Lindale. Generous friends had outfitted Jerry with clothes and other articles, that he might not be ashamed before his new acquaintances.

Jerry was given work to do and spent a busy summer. With other boys from the ranch, he attended Sunday School and Church services. He publicly confessed his faith in Jesus Christ as the Son of God and was baptized. He took an active, though humble, part in public worship.

When public school opened in September, Jerry enrolled. He chose to attend school forenoons and work on the ranch afternoons, thus being self-supporting. Mrs. LeTourneau recognized the boy's sincerity and his industry, and advanced him accordingly. He is now making good, in a responsible position on the



young people. They were much concerned and much in prayer. We were blessed, as every church in and around Lindale was reached. Many came each night for profession of faith or rededication."

## Mom's Birthday

The above picture was made just after Mrs. LeTourneau opened the door of her home to see who was singing "Happy Birthday" on the



Leg. Patents.  
a free world.

Berge, Wendell.  
Ass't Atty Genl, U.S.

Cartels - Challenge to

Am. Council on Public

affairs, 2153 Fla. Ave., Wash. 8. c. 1944



R.G.

LeTOURNEAU

talks about

## Price Control

The fixers are doing a lot nowadays to control prices, but it's pretty hard to change the law of supply and demand. My Mother used to say, "Fair exchange is no robbery, and if you drive people to it they will just start trading without any price tag like some of the natives in the jungles of Africa do today."

The cost of steel depends on the cost of ingots plus labor, and the cost of ingots depends on the cost of pig iron plus labor. The cost of pig iron depends on the cost of ore, coke, etc. plus labor, and the cost of ore and coke depends on the cost of labor to do the mining, etc. And the cost of potatoes depends on the cost of labor to raise a crop plus interest on the value of the land, and the value of the land depends on the cost of draining, if it is swamp land, or levying, if it is river bottom overflow land, or an irrigation system, if it is desert, or the cost of clearing the stumps out if it is timber land. I have had a hand in a great many land clearing projects and in most cases the clearing cost is just about as much as the land is worth. There are billions of acres of land on the earth going to waste.

The way to lower the price of potatoes and hogs and wheat, and all the the rest of the eatables that a hungry world wants and can't get, is to put these jungles into production at a lower cost. Being a construction machinery man, and somewhat interested in farming too, with a background of land clearing experience (took my first contract when I was 18 years old), I started ten years ago to develop a line of land clearing machinery. I have spent several hundred thousand dollars on experimental machines. Few people realize how long it takes to develop an idea from the dream stage to a working reality but I know from experience it takes years of sweat and toil and plenty of money before you hit pay dirt. And then sometimes it takes years to teach men how to operate a new kind of a machine so it will be successful.

This year we have cleared about 3,000 acres of real jungle timber with our new system. The principle machine is a tree saw. It is built with

large tires so it can travel over soft ground. In order to give traction in rough going it has an electric motor in each wheel so that all wheels are powered, and it steers on all four wheels so as to get in and out of tight places among the trees. It never has to dodge a stump because everything is cut level with the ground. No stumps are left. Besides the four motors that drive the wheels there are nine other power applications, each one in two directions, with 20 buttons to press and no levers. Anybody who can play a piano ought to be able to learn to play a tune on this machine. It is a circular saw, cuts five foot diameter trees with 200 horsepower, and the motions are...

Raise and lower the saw.

Roll the saw to any angle of cut from horizontal to vertical, or clear around to horizontal turned up.

Runs in and out 8 ft. like a snake's tongue.

Swings sideways and back 20 feet.

A beam like an elephant's trunk runs in and out overhead. This beam also swings sideways and back 25 feet. A stringer on the end of the beam grabs the tree and pushes it in the direction you want it to go so you can fall all the trees in the same direction, namely to the left, keeping them out of your way as you cut a swath around like cutting grain.

This gives the loggers a chance to pick out any good timber before you come around next time, cutting the next swath. Everything is cut right down on the ground so a bulldozer has no trouble bunching and burning. Then you disc the land with a heavy double disc. For about five years you raise crops that do not need to be cultivated. The rich new land will give you a surprising yield. By discing and mowing the brush has no chance to start again, and in five years the stumps will be gone. (I cleared a test piece this way six years ago.) Then you can raise me some cheap spuds and during the five years I'm going to raise some juicy steaks on pasture.



## Tom M. Olson's PAGE

### Just Too Much Religion

Two teen-age students who kidnapped five persons and stole four cars in a three-state crime spree, blamed a movie and "too much religion" for their actions.

The younger lad told officers: "All I ever did when I was home was go to church. I went three times each week and again on Sunday. Religion is not good when you get to fighting it as hard as I did."

Of course it isn't! It is both interesting and profitable to observe that the Bible only uses the word "religion" five times--and four times out of the five, in a bad sense. (See Acts 26:5; Gal. 1:13-14; James 1:26) When it is used in a good sense, it refers to a believer's works--"To visit the fatherless and widows in their affliction, and to keep himself unspotted from the world." (James 1:27)

It can be seen at a glance that the lads did not have "too much" of that which the Scripture terms "true religion."

Although the general public constantly uses "religion" as a synonym of "salvation," it is never so used in Holy Writ.

There was ample religion in the world before the Lord Jesus came into it as Savior. And the wildest savage in the jungle has his religion today. If religion would suffice, the death, burial and resurrection of the Lord Jesus Christ would have been unnecessary.

What was, and is needed, is salvation, forgiveness, redemption, regeneration. And such can only be secured and enjoyed by the exercise of faith in the finished work of the Savior on

## A New British Craze

Ancestor hunting is the new British craze! It has developed that many people who thought they were of humble origin, have "blue blood" in their veins, and are related to Britain's aristocrats.

"Debrett's Peerage", a 3,000-page book, which contains the latest facts about Britain's aristocracy is being diligently studied.

This famous book has been edited for the last thirty years by Cyril Hankinson. He carefully checks all the letters for the facts necessary to begin a search: Name, place and approximate date of birth of the writer's last known relative in Britain.

Then he sets his staff to work under the guidance of his assistant, Patrick Montague-Smith. These two men make a hobby of their work, and often sit well into the night over a particularly knotty ancestral problem.

From a few details supplied by Gordon Deed of Otaua, New Zealand, they traced his direct descent from both King Edward I of England (1272-1307) and King David I of Scotland (1124-1153).

To us there is a great disappointment in connection with family trees. If the search goes far enough, each person will discover that his mother was a thief; his father a receiver of stolen property; and his elder brother a murderer--for Eve was our mother, Adam our father, and Cain our elder brother.

It is a delight to turn from that phase of the subject and recall the word: "As many as received Him (the Lord Jesus) to them gave He the power (or authority) to become sons of God, even to them that believe on His name." (John 1:12) And, that other verse: "And if children, then heirs; heirs of God, and joint-heirs with Christ. . . (Romans 8:17)

There is nothing disappointing with redemption's song: "Thou art worthy to take the book, and to open the seals thereof: for Thou wast slain, and hast redeemed us to God by Thy blood out of every kindred, and tongue, and people, and nation; and hast made us unto our God kings and priests; and we shall reign on the earth." (Revelation 5:9-10)



5404

Jigs - put master's skill in every hand

Western factories awaited steam - before it, water power nec., N.E.

Am. emphasis on speed - Eng. on perfection

Instalmit plan, begun by Cyrus McC. & Isaac Singer

Oiver Evans - <sup>of Del.</sup> card-maker, for carding & 4 consecutive op-ns by one machine)  
Grain mill's. Sequence of machines, linked by conveyor belts,  
vertical & horiz. Endless belt, & revolving screw. (Archimedes?)  
By 1787, mill ran. Untouched by human hand.  
Del. & Pa. patents, but widely borrowed w/o payment.  
Endless suits.

Eli Whitney - gin, to 1798. Muskets: div. of fn, interchangeable parts  
Sam Slater - brought textile mach. from Belper, Derbyshire, to Moses Brown at Providence  
Sam Collins - mass-produced axes near Haverford. Elisha Root improved  
C. McC - reaper. As early as 1844, began to sell in west. O. Hussey might have won  
out, but moved from Cinn. to Balt., away from mkt, & McC. moved from Va. to Chi.  
allied w. Chi's no. 1 land spec., Wm. B. Ogden.  
Sam Colt. Revolver, from 1844. Whitney Jr made tools. Elisha Root mgd plant, hired away  
from Collins axe.  
Eli Terry, Seth Thomas, Silas Headley - wooden clocks, 1800-30  
Chauncy Jerome, brass clock from stamping, 1837  
Laron Dennison, watches



Re patents: C. McL. at 1st tried to license his machine out. But licensees produced non-uniform product, in W. NY, Mo, O., Ill. Might work better today (Coca-cola e.g.). (Olin Evans did it c. 1800?, p 28-9)

C. McL, single-minded devotion to reaper. Pushed out Ogden, but was irreverent to his outside interests. Believed self agent of God, thus rationalized cut-throat & final Int. H. combine

1850s, Colt set up ~~brass~~ <sup>complete</sup> assembly plant in London. Whole system was new to Eng. Highly mechanized, dispensed w. skilled ones. But closed - "prejudice, ignorance, taxes, red tape." (?)

To Americans time was a more valuable resource. Hence greater emphasis on making it. <sup>p. 97</sup> Cheap clocks. 1790-1830. wooden parts, standardized, mass produced. Bristol, Plymouth, Farmington, Ct.

Chauncey Jerome. 1830s, Va. put prohibitive licenses on Yankee peddlars. (p. 101) Jerome est. assembly plant in Richmond, '1835; in SC, '36. Wooden clocks.

1837 crash, Jerome hit on idea of stamping brass parts from metal sheets. Previously, forged or cast by hand. But in Waterbury bus. had grown in "Yankee notions" - cheap brass stampings, peddled w. wooden clocks all over. Jerome applied to clock parts. The \$1.50 clock.



1840, Jerome sent 1st \$1.50 brass clock to Eng. Customs officers thought he was undervaluing, confisc. for \$1.50/clock. So he sent more, guaranteed mkt, until they were convinced.

Whitney's system model for subsequent mass prod-n. Springfield Nat army adopted. Dennison saw it there, applied to watches.

When all had watches, scheduling, etc possible, closer integr-n of human activity

1851, Am. exhibit at Crystal Palace Exh., interch. parts, first Eur. had heard of it! The Enfield Rifle. Brit. Army at Enfield equipped by Lawrence & Robbins, Windsor, Vt.

Peddling preceded mass prod-n. p. 112 First they peddled from handicrafts, surpluses from activity of long winters. But when mkt became evident, factories grew to supply.  
(Probably peddling in so. was popular to get ~~summer~~<sup>winter</sup> vacation)

Machine tools - basically all alike, a few basic ones. p. 116. drills, millers, lathe. Master these, make anything.  
'for cutting & polishing & planing



Re patents. By 1790, text. machines in G.B. were public prop. Arkwright's success was from know-how, not control of patents. p. 43

E. Whitney failed to make gin patents stick. Hence led into greatest invention, interchangeable parts. He tried to make go of cotton gin, but by 1798 was licked.

Sam Collins axes were trade marked, 1st est. nation wide validity of such.

A nec. prelim. to machine use was sub'g unskilled men for craftsmen by break'g down prod-n into simple steps. This occurred in U.S. bcs craftsmen scarce & costly. Then, as steps were simple, machines cd take over. Of course this break'g into steps also requires xptn among individ. workers or machines

Large govt orders often played key role in birth of mass prod-n. Whitney's muskets, 1798, to meet French scare. Civil war.

Whitney put his skill in every hand by jigs, clamps, fixtures. Hamden, Ct., factory.



Ford's victory ~~of~~ over ALAM  
Selden patent mpy.

5505  
~~5405~~, p. 52-5

Ford's opposition to patents (&  
industrial secrecy)

5478 p. 292

Ford car grew substantially  
w/o patents, probly safe to say.  
(Maybe - they're easy, tho)



John Boyd Dunlop - pneumatic tire for bikes, c. 1888

Gordon McKay - used sewing machines for shoes. Civil war

Stephen Fitch. Turret lathe 1845

Chris. Spencer Automatic turret lathe 1870

Fred. R. Howe Universal millig machine. (c.c. 1830?)

Th. Blanchard. "Stocking" lathe, for irregular shapes.

E. Howe, Jr.; Isaac Singer; etc., sewing machine

French culture has produced plenty of inventors, thinkers. But no mass mkt. E.g. Barthélemy Thimonnier, 1831, 80 sewing machines for army uniforms, mob destroyed. Panhard & Levassor car, just for rich. 146, auto is of French origin.

Inventors as jealous folk. Sue for patent breach. Howe, Evans, McC, Whitney, Colt. Is so? Is mpy required?

1860s, lead's sewing machine mfrs joined in patent pool, shared all. p. 128. "Just as today" fluid dr., autom brakes, hydraulic brakes, shared by all "lead's" motors. (Hmm). Singer pioneered instalment sell'g - to hmwrs.

Civil war, govt buyers developed 1st stat. in mwarents, on which ready made cloth'g ind-y developed postwar.



1890, Popes, of Hartford, w. Dunlop's pneumatic tire, introduced "safety" bike, began 20 yr craze, for cramped city dwellers. Paved way for car - literally. Began org. movements for good roads. Producers of parts were on hand to provide auto essentials

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France began auto, then Fr. & Eng. competed. Eng. way behind, bes of laws vs fearful road machines. U.S. way behind. Then, 1908, model T. Eur. output ~~low~~ by craftsmen. Ours by machine sequences.

p. 151 Ford initial inv. \$28,000. All rest plowed back.

Ford bought stock for \$100m

p. 155 In '30, Ford had big surplus, expended, bought up timber, soybean land, iron mines, steel mills, tire plants, rubber plants, glass works. <sup>coal mines</sup> 156 "abolished warehouses" - I doubt.

160. New flexible machine sequences, adjust to new products w/o retrofitting.



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