

## THE JOHN SCOTT MEDAL

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THE DISTINCTION of the names which are added year by year to the already impressive list of recipients of the John Scott Medal is ample evidence that this large copper medal and the accompanying monetary prize constitute one of the most important honors which American science has to offer. The awards, which usually number some four or five a year at the present time, are made by the Board of Directors of City Trusts of Philadelphia, acting on the recommendations of a special advisory committee, and they go to men and women who, by their inventions, have contributed in some outstanding way to "the comfort, welfare and happiness" of mankind. Today the official requirement that the work so honored should fall into the category of "invention" places little restriction on choice and it has certainly not prevented many scientists whose "inventions" have also had the greatest theoretical significance from becoming John Scott medalists.<sup>1</sup> This, however, has not always been the case and it may come as something of a surprise to know that until some fifty years ago, i.e., for roughly the first hundred years of its existence, the medal was essentially a reward for "gadgeteering" rather

than for work which we should now consider genuinely scientific. The fact that men such as George Westinghouse and Thomas Edison were among the recipients in this earlier period does little to conceal generally low standards and a certain narrowness on the part of the administrators of the award in their interpretation of what constituted a "useful invention."<sup>2</sup> In this, of course, the administrators were acting against the background of the strong utilitarian traditions which were prevalent in American science in the eighteenth and early nineteenth centuries and it is only natural, therefore, that with the dying of these traditions the character of the John Scott Medal and premium should have changed also. That the changes have been for the better is beyond dispute, yet in the process the origins and initial purpose of the award have become quite obscured, and it is my intention in this paper to try to reconstruct something of the award's early history, as a contribution to our understanding of the roots of present-day American science. To be reminded, as we shall be here, that these roots were often humble is not perhaps unsalutary.

John Scott himself is a biographer's nightmare. He published neither books nor papers and references to him are few and brief. That he was a pharmacist and that he spent a good deal of his life in Edinburgh are beyond dispute, however. In the annual Edinburgh street directories he appeared for the first time in the issue for 1774-1775,<sup>3</sup> styled as "druggist" and with his address given simply as "near the infirmary." Thereafter his name was included without a break for thirty years.<sup>4</sup> Always he appeared as "druggist,"

<sup>1</sup> Among the most notable of these is the late Lord Florey, who received a Scott Medal in 1965 for his contributions to the discovery of penicillin. It was Lord Florey who first drew my attention to John Scott and I am indebted both to him for the interest he subsequently showed in the work and to The Queen's College, Oxford, where Lord Florey was Provost and where, as Clifford Norton Research Fellow in the History of Science, I wrote this paper. I wish to express my gratitude to Lady Florey for her kind cooperation in arranging for her husband's medal to be photographed and to Mr. S. Buckingham of the Sir William Dunn School of Pathology, University of Oxford, who took the photographs. My thanks are also due to Dr. Whitfield, J. Bell, Jr., Librarian of the American Philosophical Society, Dr. J. S. Hepburn, Archives Researcher at the Franklin Institute, Philadelphia, Mrs. Mary H. Lakie of the Scottish Department of the Pharmaceutical Society of Great Britain, Mr. C. P. Finlayson, Keeper of Manuscripts at the Edinburgh University Library, and Mrs. Ruth J. Armour, Assistant Secretary to the Board of Directors of City Trusts, Philadelphia, all of whom have provided both information and advice which have been invaluable.

<sup>2</sup> This term was used by Scott himself when he established the award. See below, p. 418.

<sup>3</sup> *Williamson's Directory, for the City of Edinburgh, Canongate, Leith and suburbs, from the 25th May 1774, to 25th May 1775* (Edinburgh, 1774). The possibility that Scott was in business before 1774 cannot be ruled out, since only one previous issue of the directory had been published, in 1773, and the absence of Scott's name from this may simply reflect the incompleteness of records at the start of Williamson's new venture.

<sup>4</sup> The Edinburgh street directories covering this period are successively that of Williamson (cited in n. 3),

"apothecary and druggist," or "chymist," but from 1779 his address was given successively as College Street, "foot Robertson's close," and College Wynd, all of which were close not only to the Royal Infirmary but also to the university, then at the height of its fame and enjoying an international reputation. Eventually, about 1796, Scott moved to 2 St. Patrick's Square, the address associated with him in all documents relating to the medal fund, and about the middle of 1801 his address changed yet again, this time to Richmond Street.<sup>5</sup> Why he should have moved so frequently is not known, but the nature of his moves strongly suggests the increasing prosperity of his business. In March, 1788, he had been able to invest a considerable sum of money with the city of Edinburgh<sup>6</sup> and it was natural that a man of such means as this should decide to leave the cramped and decaying "Old Town," where his earlier addresses are all to be found, and move out to the newer and more elegant St. Patrick's Square and Richmond Street on the south side of the city.<sup>7</sup> In an Edinburgh which in the late eighteenth and early nineteenth centuries underwent unprecedented expansion both to the north and to the south of the "Old Town" such a move would have been a wholly typical one for any successful businessman.

We are fortunate in being able to throw at least some light on Scott's activities during this period of residence in Edinburgh. In 1780 the

Thomas Aitchison's *The Edinburgh and Leith Directory*, Donovan and Co.'s *Edinburgh and Leith Directory*, and *The Post-Office Annual Directory . . . [for] Edinburgh and Leith*, all published in Edinburgh.

<sup>5</sup> In Aitchison's directory for 1801-1802 Scott's name appears, on p. 59, in a list of residents "who have moved since Whitsunday 1801." His address is here given as Richmond Street, although in the main body of the directory, on p. 180, he is still shown as residing in St. Patrick's Square.

<sup>6</sup> Of this investment we know only the date mentioned in the text and the fact that its total value, presumably including accumulated interest, was £1,440 at the time of Scott's death in 1815. The information appears in the inventory of Scott's estate cited in n. 12.

<sup>7</sup> Despite its proximity to the university and the eminence of some of its residents in the eighteenth century (on which see J. Grant, *Cassell's Old and New Edinburgh* (3 vols., London, n.d.) 2: pp. 253-255), College Wynd, where Scott spent most of his years in the "Old Town," was far from attractive. Among those who left it to move southwards in the 1770's was the family of the infant Walter Scott (see the Macmillan "Library of English Classics" edition of J. G. Lockhart, *Memoirs of Sir Walter Scott* (5 vols., London, 1900) 1: pp. 63-64).

physician Andrew Duncan, writing in the journal *Medical Commentaries*,<sup>8</sup> which he edited, described some chemical experiments which Scott had been "in the practice of shewing in his course of Pharmacy for several years past" and which he (Scott) had used to good effect in his pharmaceutical work, notably in the treatment of venereal diseases. The fact that he was known to a man of the eminence of Duncan, who had already earned a considerable reputation as an independent lecturer and who was later to become president of the Edinburgh College of Physicians and to occupy a chair of medicine at Edinburgh University,<sup>9</sup> can in itself be taken as evidence of a certain distinction on Scott's part, but of the course in question no other details have survived. It is not improbable, however, that the lectures were given at the Public Dispensary in Edinburgh, later the Royal Public Dispensary, a charitable institution where treatment was given free of charge to patients whose illnesses did not warrant their being admitted to the Royal Infirmary. The Dispensary<sup>10</sup> had been founded by Duncan in 1776 and it was thereafter managed by him in his capacity as senior physician, so that Scott may well have been among those other unnamed "physicians" who are known to have attended without salary and who gave lectures "on such singular and important cases as occur"<sup>11</sup> to students of medicine, as a means of raising funds for the institution.

After 1804 Scott's name did not appear again in the Edinburgh street directories and there is at least some reason to believe that about that time he left Edinburgh for London. We know, for example, that the first part of his Will,<sup>12</sup> dated

<sup>8</sup> *Medical Commentaries . . . collected and published by Andrew Duncan, M.D.* 7 (1780): pp. 363-366. In the second edition of the *Medical Commentaries*, published in 1783, the reference to Scott's experiments appears on pp. 410-413. It was Dr. Whitfield J. Bell, Jr., who kindly drew my attention to this passage.

<sup>9</sup> For details of Duncan see the article on him in the *Dictionary of National Biography*.

<sup>10</sup> For a contemporary account of the Dispensary see H. Arnot, *The History of Edinburgh* (Edinburgh & London, 1779), pp. 552-555.

<sup>11</sup> *Ibid.*, p. 553. See also *ibid.*, p. 404n.

<sup>12</sup> The Will itself has not been traced, but a copy, to which is attached an inventory of Scott's estate, is in the Records Office, Register House, Edinburgh, bound as *Com. Edin. Inventories*, 2nd ser., 21: ff. 405-410. The copy, dated 6 February, 1816, was made when Scott's executor, Samuel Paterson, presented the Will for "confirmation" at the Sheriff's Office for the Sheriffdom of

2 October, 1809, was written in London and in it Scott stated that his wife, Euphemia Torrence, to whom he left all his plate and furniture together with a £100 annuity, was then living with her sister "opposite the Archers hall"<sup>13</sup> in Edinburgh. Such a statement suggests that his visit to London was not a brief one and subsequent small bequests to two London friends tend to confirm that he resided for some appreciable time in the city. Why Scott should have chosen to part from his "dear . . . highly esteemed and much beloved wife," as he called Euphemia in the Will, must remain a mystery, but it was in London that he died on 18 August, 1815.<sup>14</sup> How or even where Scott spent the last ten years of his life is thus far from certain, but if London was in fact his home during this period, it is tempting to wonder whether he may have been the same John Scott who practiced as "chemist and druggist" at 193 Strand (from 1806 to 1808) and at 278 Oxford Street (from 1809).<sup>15</sup> The fact that the Oxford Street premises were rated in Scott's name as late as 1817<sup>16</sup> cannot in itself rule out this possibility, since delays in the amendment of rate books were by no means uncommon at this time.<sup>17</sup>

Edinburgh. The procedure of "confirmation" was necessary before the terms of the Will could be put into effect and, once it was completed, the original document would normally have been returned to the executor in order to enable him to carry out his duties. I am grateful to Mrs. Mary H. Lakie for locating this important document.

<sup>13</sup> Archers' Hall, the imposing headquarters of the Queen's Body Guard for Scotland, Royal Company of Archers, was and still is in Buccleuch Street, very close to St. Patrick's Square. A Miss Torrence, presumably Scott's sister-in-law, appears in the street directories at the address mentioned by Scott from 1807 until 1819.

<sup>14</sup> This is the date given in the document cited in note 12, but the obituary announcements in *The Scots Magazine and Edinburgh Literary Miscellany* 77 (1815): p. 875, in *The Edinburgh Evening Courant*, no. 16290 (6 November, 1815) and in *The Edinburgh Weekly Journal* 18 (8 November, 1815): p. 377, all refer to Scott as having died in London on 19 August, 1815.

<sup>15</sup> The addresses and dates are from the relevant issues of *The Post Office Annual Directory* for London.

<sup>16</sup> From information kindly supplied by Mr. A. F. Osborn, Head of the Reference Division of the Westminster Public Libraries, London, who has charge of the rate books for the area.

<sup>17</sup> Similar considerations may account for the fact that the name of this Scott was still included in the London Post Office directory for 1817 and even in Thomas Underhill's *Triennial Directory of London, Westminster . . . for the years 1822-23-24* (London, n.d. but probably 1821).

Even if Scott did spend the last years of his life in London, his connections with Edinburgh remained strong. In one of the last codicils to his Will Scott chose to refer to himself as "late Chemist in Edinburgh"<sup>18</sup> and it was a close Edinburgh friend, Samuel Paterson, living at nearby Dalkeith but formerly a cloth merchant in the city, who acted as his sole executor, having been appointed by him in June, 1814. It was in Edinburgh also that codicils to his original London Will were added in March, 1811, June, 1813 and in June and September 1814.<sup>19</sup> The codicil of 9 June, 1813, is of special interest for our purpose, containing as it does the following passage:

I John Scott late Chemist in Edinburgh do leave to the Corporation of Philadelphia who are entrusted w<sup>th</sup> the management of Dr Franklin's Legacy the sum of Three thousand Dollars of my property in the American three per cents to be applied to the same purposes as Dr Franklin's Legacy, and I also leave Four thousand Dollars from the same fund my property in the three per cents the interest of which is to be laid out in premiums to ingenious men or women who make useful inventions no premium to exceed Twenty Dollars along with which shall be given a copper medal w<sup>th</sup> this inscription—To the most deserving.

On 2 April, 1816, with the formality of "confirmation" completed,<sup>20</sup> Paterson obtained power of attorney to put into effect those parts of the Will which related to the American bequests<sup>21</sup> and he designated James Ronaldson, formerly of Edinburgh but now a prominent citizen in Philadelphia,<sup>22</sup> to be responsible for transferring the \$7,000 of stock to the corporation of Philadelphia on the condition that it was used in accordance with Scott's wishes.

Although it is the passage in the Will relating to the establishment of the medal and premium which is of special interest in this paper, the bequest of \$3,000 of stock to be used for the same purposes as Benjamin Franklin's legacy deserves some mention also, if only for the light which it

<sup>18</sup> He is so described in all obituary announcements. See n. 14 for references.

<sup>19</sup> The codicils are also to be found in the document cited in n. 12.

<sup>20</sup> See n. 12.

<sup>21</sup> *Extracts from the Wills, Deeds, etc. creating the several trusts held by the City of Philadelphia* (Philadelphia, 1919), pp. 37-38.

<sup>22</sup> On Ronaldson see M. Tait, "James Ronaldson, Baker, Typefounder, Philanthropist, and his Connexions in and around Edinburgh," *The Book of the Old Edinburgh Club* 28 (1953): pp. 44-50.

throws on the principles underlying Scott's philanthropy. The purposes of the Franklin legacy to which Scott referred were laid down by Franklin in a codicil to his Will dated 23 June, 1789.<sup>23</sup> Here Franklin stipulated that the sums of £1,000 which he left to each of the townships of Boston and Philadelphia should be used to establish funds from which loans were to be made, at an interest of 5 per cent, to "such young married artificers, under the age of twenty-five years, as have served an apprenticeship in the said town, and faithfully fulfilled the duties required in their indentures, so as to obtain a good moral character from at least two respectable citizens . . .," the object of the loan being to help such young men in setting up their own businesses. It should be noted that the loans were intended in no way as a vehicle for charity but rather as a reward for work well done, in which respect the bequest was wholly consistent with Franklin's philosophy, in which the ideals of thrift and industry figured so prominently.<sup>24</sup> Scott, we must assume, shared at least some of Franklin's convictions on this matter, but the fact that he left the whole of the residue of his estate to be divided between the Charity Workhouse and the Royal Infirmary, both in Edinburgh, suggests that he was somewhat more charitable than Franklin in his attitude to the poor and indigent. Unfortunately, neither Scott's loan fund nor Franklin's has entirely fulfilled the aims for which it was established. Even during the nineteenth century there were many years in which no applications at all were made to either fund and a combination of the increasing availability of financial assistance from other sources and the decreasing number of men who were able to meet the conditions of eligibility laid down by Franklin has meant that in recent years dramatic modifications in the terms of the bequests have had to be made. As a result of these modifications good use is again being made of the funds and loans are now used primarily to assist young men and women, up to the age of 39, with the purchase

of their own homes, irrespective of their trades or professions and free of any requirement concerning the completion of an apprenticeship or training in Philadelphia.<sup>25</sup>

Why Scott should have chosen an American city to administer his bequest is not known. However, since the stock bequeathed had been purchased as early as December, 1797,<sup>26</sup> we may be sure that his interest in America was of long standing. It is quite possible that, along with so many others in Britain at the time, Scott simply found himself in sympathy with the ideals of American republicanism and that he saw his action as a way of giving tangible expression to his beliefs. But a more immediate contact with America cannot be ruled out. For example, Scott may well have known something of Philadelphia at first hand from James Ronaldson,<sup>27</sup> who visited the American city in 1791 and who resided there permanently from 1794, making his name with a prosperous typefounding business, among numerous other activities, and eventually, in 1824, becoming the first president of the newly founded Franklin Institute. The fact that Ronaldson was apparently known to Scott's close friend Samuel Paterson<sup>28</sup> makes this more than a remote possibility. One other possible contact with Philadelphia, although less likely, deserves mention also. This is that Scott may have had friends among the many young men who, especially in the two decades preceding the War of Independence, came from America to study medicine and related subjects at the university in Edinburgh. Indeed, he may even have been the John Scott of Alloa in Clackmannanshire who attended William Cullen's course on chemistry in 1762-1763 and 1763-1764 and in whose class for the latter year were two Philadelphians, James Tapscott and Thomas Ruston.<sup>29</sup>

<sup>25</sup> It was one of the conditions of Franklin's bequest, and hence also of Scott's, that after a hundred years had elapsed a certain proportion of the capital accumulated in the fund should be spent on public works. With the money so allocated from the John Scott Loan Fund the city of Philadelphia built a bandstand in Reyburn Plaza.

<sup>26</sup> The details appear in the inventory cited in n. 12.

<sup>27</sup> On p. 49 of her article on Ronaldson (see n. 22) Miss Tait refers to Scott as "a friend of [Ronaldson's] Edinburgh days," but no evidence for this statement is given.

<sup>28</sup> See above, p. 418.

<sup>29</sup> The names and places of origin are given in Cullen's own hand in a list headed "Students in the College of Chemistry." In this list, which is in a notebook now

<sup>23</sup> Franklin's will and codicil have been reproduced so often that it is hardly necessary to give a reference, but a particularly accessible source is J. Bigelow (ed.), *The Life of Benjamin Franklin, Written by Himself* (3rd ed., 3 vols., Philadelphia, 1893) 3: pp. 470-489, where the relevant passage in the codicil appears on pp. 480-485.

<sup>24</sup> Franklin expresses his views on this subject with particular clarity in *The Way to Wealth or poor Richard improved*, consulted by me in the Paris edition of 1795.

If this was in fact the case, it would give us a much needed clue concerning the date of Scott's birth, fixing it in all probability some time in the mid-1740's. This, however, can be no more than conjecture, although it would be consistent with the chronology of Scott's later life.

It is disappointing to have to leave Scott's biography in this state and small consolation to know that, by comparison with his life, the history of the awards made under his bequest is extremely well documented. From the time the first medal and premium were presented in 1822 the list of recipients appears to be complete. Originally, by an ordinance of the city of Philadelphia dated 22 November, 1821,<sup>30</sup> the medalists were nominated on the city's behalf by a committee of the Philadelphia Society for Promoting Agriculture, but on 27 February, 1834, this duty was transferred to the Franklin Institute,<sup>31</sup> whose Committee on Science and the Arts continued to make the necessary recommendations on the basis of inventions submitted to it until 1919, in the first place to the city authorities and from 1869 to the newly instituted Board of Directors of City Trusts, a body of twelve citizens appointed by the Judges of the Courts of Common Pleas to give their services without compensation of any kind. In the period to 1919, 499 awards were made, usually for devices of limited application and simple basic principles rather than for work which involved fundamental discoveries, either in theory or in technique, on the part of the inventor. Naturally the devices became increasingly sophisticated over the years and they did reflect scientific advances of a more theoretical nature, notably in electricity, but there can be no avoiding the fact that it was "gadgeteering" which was being rewarded, whether the award was for "an easy garden weeder" (as in 1822) or for a "locomotive stoker" (as in 1915). Since the size of the premium, even in 1919, was still limited to

the \$20 laid down by Scott, the modest standard of the work submitted for the awards is hardly surprising<sup>32</sup> and it was not until 1919-1921, when the Directors of City Trusts received the authority of the Court to modify the original conditions, that the John Scott Medal began to assume its present status. The procedure whereby entrants had to submit their inventions for consideration by the Committee on Science and the Arts was abandoned and replaced by the current practice of offering the award to men and women nominated by an advisory committee which was, and still is, appointed by the Directors of City Trusts. An even more important modification, however, was the raising of the upper limit on the premium to \$2,000,<sup>33</sup> the limit in force today, and there can be no doubt that it was principally as a result of this innovation that the whole nature of the award changed. Quite suddenly it became international in character, as is shown by the fact that Marie Curie and Sir J. J. Thomson were among the recipients in 1921 and 1923 respectively, and although the utilitarian element was by no means eliminated, it was the fundamental scientific research leading to useful applications which came increasingly to be recognized. Since the reorganization of 1919-1921 few changes have taken place. The special advisory committee has had no difficulty in maintaining a consistently high standard and hence in establishing the Scott Medal as an award of international standing.

Scott himself would probably have viewed these developments with a mixture of astonishment and, above all, pride. Yet it is hard to believe that the humble, if prosperous,<sup>34</sup> Edinburgh pharmacist would have been wholly at ease among the leading men of science who receive his medal today. His real sympathies, we may be sure, would have lain rather with those men and women of more ordinary attainments who submitted their inventions in the hope of receiving some small material reward and recognition during the first hundred years of the medal's existence.

preserved in the Edinburgh University Library (MS Da.3), Cullen entered the names of all the students who attended his course in chemistry from 1755 until 1765. Unlike his American contemporaries, this Scott, whose only other medical course was in anatomy, did not graduate. His signature appears on the page from the university's matriculation record reproduced in Whitfield J. Bell, Jr., "Some American Students of 'That Shining Oracle of Physic,' Dr. William Cullen of Edinburgh, 1755-1766," *Proc. Amer. Philos. Soc.* 94 (1950): p. 278.

<sup>30</sup> *First Annual Report of the Directors of City Trusts* (Philadelphia, 1871), pp. 74-75.

<sup>31</sup> *Ibid.*, p. 75. See also *Jour. Franklin Inst.*, n.s., 15 (1835): p. 177.

<sup>32</sup> At least in the early years of the "Franklin Institute" period the shortage of good applicants for awards from the medal fund appears to have been a matter for concern. See *Jour. Franklin Inst.* n.s., 15 (1835): p. 178 and *ibid.* 24 (1839): p. 313.

<sup>33</sup> A modification made possible by the fact that the prize fund had now grown to \$100,000.

<sup>34</sup> According to the inventory cited in n. 12 the value of Scott's estate, excluding his American stock, exceeded £2,832 at the time of his death.





FIG. 1. The John Scott Medal. The medal shown was awarded to the late Lord Florey (then Sir Howard Florey) in 1965. It is reproduced by courtesy of Lady Florey.

#### JOHN SCOTT MEDALISTS, 1822-1968

##### *Awards Made by the Philadelphia Society for Promoting Agriculture, 1822-1833*

1822

I. To Samuel Goodwin, for a Front Door Lock—Twenty Dollars.

II. To Dr. James Ewing, for a Screw-cock Hydrant—a Medal and Twenty Dollars.

III. To Coleman Sellers, for a simple and effectual Cupping Instrument—a Medal and Twenty Dollars.

IV. To Thomas Barnitt, for a Press to force out the unnecessary quantity of tar absorbed by yarn, in the manufacture of cordage—a Medal and Twenty Dollars.

V. To Isaac Conard, of Lampeter township, Lancaster county, Pennsylvania, for a simple and effectual Barrow to plant Indian corn—a Medal and Twenty Dollars.

VI. To George Harper, for two Drills, one for potatoes and one for seeds—Ten Dollars.

VII. To Wm. Shotwell, for an easy Garden Weeder—Five Dollars.

VIII. To Robert Welford and James H. Deas, for an improved Plane with frictionless rollers, for planing floors—a Medal and Twenty Dollars.

IX. To Daniel Niell, for a Vertical Printing Press—a Medal and Twenty Dollars.

X. To James Gardette, dentist, for three mechanical improvements in his profession; which are highly commended in Europe and the United States; and for a simple Lever instrument, for the easy and expeditious extraction of teeth, and stumps of teeth—a Medal and Twenty Dollars.

XI. To Jonathan Nicholls, of Providence, Rhode Island, for a portable Carriage Spring Seat—a Medal and Twenty Dollars.

XII. To John Meer, for a Razor Strop—a Medal and Twenty Dollars.

XIII. To Mrs. Frances Jones, for an Improvement in the apparatus for making patent Lint—Twenty Dollars.

1825

XIV. To Benjamin Freymuth, for a very ingenious Chamber Alarm Bell, which can be attached to a watch—a Medal and Five Dollars.

XV. To John C. Jenckes, of Providence, Rhode Island, for an Apparatus to enable persons with fractured limbs to be moved in their positions in bed, without injury—a Medal and Twenty Dollars.

1827

XVI. To Robert Eastman, of Brunswick, Maine, for an Improved Rotary Saw-machine, for sawing clap boards—a Medal and Twenty Dollars.

XVII. To Joseph Woodhouse, of Otsego county, New York, for a Paper-cutting Machine—a Medal and Twenty Dollars.

XVIII. To Abraham Corl, of Pugh town, Chester county, Pennsylvania, for a Drill for clock and watch maker's work—a Medal and Twenty Dollars.

XIX. To Joel Taylor, of Danbury, Connecticut, for an Apparatus for Dying Hats—a Medal and Twenty Dollars.

XX. To Daniel Powles, of Baltimore, for a Bedstead which can be put up and taken down by any person, owing to the peculiar construction of the joints, and is proof against insects.

XXI. To Daniel Powles, for a Stirrup, which effectually prevents the foot from sticking, in case a person is thrown from a horse—a Medal and Twenty Dollars.

XXII. To James Cooper and Thomas Barnitt, for a Hat-finishing Apparatus—a Medal and Twenty Dollars.

XXIII. To the Messrs. Terhoeven, brothers, of Philadelphia county, for an Apparatus which winds the silk from the cocoons, and twists and doubles it at one operation—a Medal and Twenty Dollars.

1828

XXIV. To Francis H. Smith, of Baltimore, for an improvement in Musical Glasses, by which a piece of music can be played on any key, according to their arrangement. These glasses are adapted to church music, and are actually in use in a church at Harrisburgh—a Medal and Twenty Dollars.

XXV. To Owen Corr, of Chambersburgh, Pennsylvania, for an apparatus to butt and joint Shingles. It gives a straight edge with one cut—a Medal and Twenty Dollars.

1829

XXVI. To Franklin Kelsey, of Middletown, Connecticut, for a Washing Machine—a Medal and Twenty Dollars.

XXVII. To Amos Larcum, of Albany, New York, for a Washing Machine—a Medal and Twenty Dollars.

XXVIII. To James Russel, of New York, for a Bell-Index, which prevents the necessity of hanging a bell for each apartment in the bar-room of a hotel, or in the kitchen or servants' hall of a private dwelling—a Medal and Twenty Dollars.

1830

XXIX. To Henry Aikin, of Drawcut, Massachusetts, for a Knife to split Leather Straps, for the use of workers in leather—a Medal and Twenty Dollars.

XXX. To Ebenezer Whiting, of Berkshire, Tioga county, New York, for a Saw-set—a Medal and Twenty Dollars.

1831

XXXI. To T. H. Smith, of Baltimore, for a Drill to sow Cotton seed, corn, and other grains—a Medal and Twenty Dollars.

XXXII. To Joseph Jennings, of New York, for a House Warmer and Cooking Apparatus combined—a Medal and Twenty Dollars.

XXXIII. To Jonas P. Fairlamb and Miller Dunot, of Wilmington, Delaware, for a Water Cracker and Biscuit Machine—a Medal and Twenty Dollars.

1832

XXXIV. To Dr. Barrabino, of Philadelphia, for an Improved Stomach Pump—a Medal and Twenty Dollars.

XXXV. To Samuel D. Breed, of Philadelphia, for a mode of Cementing Gum Elastic or Caoutchouc to Leather—a Medal and Twenty Dollars.

1833

XXXVI. To Adam Brooks, of Scituate, Massachusetts, for a Machine, by which Silk can be wound off from cocoons, and then formed into Sewing Silk, by one operation—a Medal and Twenty Dollars.

XXXVII. To John Stephens, of Philadelphia, for an Improved Door Lock, by which one bolt answers the end of a latch bolt—a Medal and Twenty Dollars.

*Awards Made by the Franklin Institute,  
1835-1918*

1835

N. Bassett—Compasses.

W. A. Burt—Variation Compass.

T. Ewbank—Lead Pipes.

A. Holcomb—Reflecting Telescope.

John McMullen—Machine for Knitting Stockings.

P. Tyler—Shifting Gauge Cock.

1836

A. Prutzman—Door Lock.

1837

Elmer & Little—Chronometer.

F. Mahan—Measure Case Ruler, Stereotyping.

1838

E. W. Bean—Ascertaining Latitude.

1839

L. C. Denison—Corn Sheller.

T. S. Ridgeway, Jr.—Transit Theodolite.

T. Wood—Fountain Pen.

1840

I. Babbitt—Axle Boxes for Railway Cars.

W. Jenks—Fire Arms.

J. S. Kite—Safety Beam.

Merrick & Towne—Boring Machine.

H. M. Naglee—Flat Bar or Edge Rail for Railroad Curves.

C. Olds—Planting Machine.

F. Peale—Coining Presses at the U. S. Mint, Philadelphia.

J. Rhoads—Map for the Blind.

W. Strickland—Substitution of Lime for Salt for Preserving Ships.

S. E. Winslow—Pivot Scale Beam.

1841

R. B. Forten—Telescope.

Richardson—Door Spring.

J. Saxton—Reflecting Pyrometer.

1842

L. Anderson—File Cutting.

I. Babbitt—Soft Metal Boxes.

A. Calderhead—Looms.

W. E. Grimes—Smut Machine.

T. Hill—Occultator.

1843

Alfred C. Jones—Shaft Couplings.

1847

Zebulon Parker—Water Wheel.

1848

Sabin W. Colton—Locks.

A. G. Heckrotte—Car Coupling.

B. F. Palmer—Artificial Leg.

H. S. Stellwagon—Sounding Apparatus.

1849

M. Villeroi—Telescope.

1850

C. Carnell—Brick Machine.

1851

W. C. Grimes—Water Gauge for Steam Boilers.

1852

K. Goddard—Carriage Axle.

L. H. Parsons—Scale Measure.

1853

J. Dilks—Water Gauges.

G. Faber—Magnetic Water Gauge.

P. N. Receveur—Rose Engine (Lathe).

J. Senneff—Metallic Heddles.

1854

J. Atkins—Self-Raking Automaton Reaper and Mower.

R. Bates—Instrument for the Cure of Stammering.

J. McMahan—Stereotype.

C. D. Thum—Varnish Brushes.

1856

W. Chauvenet—Great Circle Protractor.

J. D. Dale—Wood Moulding Machine.

- 1858  
J. B. Francis—Tooth Extractor.
- 1859  
J. W. Fawkes—Steam Plow.
- 1860  
E. S. Ritchie—Improved Rhumkorff Coil.
- 1868  
J. H. Richardson—Improved Signal Lantern.
- 1871  
Thomas Shaw—Gunpowder Pile Driver.
- 1873  
J. H. Irwin—Lantern.
- William Wharton, Jr.—Safety Railway Switch.
- 1874  
F. S. Baldwin—Calculating Machine.
- C. Chambers—Book Folding and Pasting Machine.
- G. Westinghouse, Jr.—Railway Car Brake.
- 1875  
J. G. Baker—Pressure Blower.
- J. W. & Tatham B. Brittin—Safety Catch for Elevators.
- Cyrus Carleton & Charles H. Wilcox—Automatic Tension and Improvements in Sewing Machines.
- J. A. Davis—Vertical Feed for Sewing Machines.
- Carlos Gliddens, C. Latham Sholes & Samuel W. Soule—Typewriter.
- E. A. Goodes—Sewing Machine.
- R. B. Goodyear—Harness Motion for Power Looms.
- R. B. Goodyear—Shuttle Box Operating Mechanism.
- H. R. Heyl—Wire Fastened Paper Boxes.
- Hutchins & Mabbitt—Tilting Chair.
- J. Morton Poole & Co.—Invention for Grinding Metallic Calendar Rolls.
- J. E. Prunty—Relief Valve.
- P. H. & F. M. Roots—Rotary Pressure Blower.
- T. J. Rorer—Improved Belting.
- C. Tyson—Machine to Unite Uppers to the Soles of Boots and Shoes.
- G. Wale & Co.—The College Lantern.
- 1876  
C. Chambers—Brick Machine.
- Morris L. Orum—Mandrel for Bending Metal Pipes.
- 1877  
G. L. H. Behrns & A. Bremer—Aspirator for Mill Stones.
- G. B. Grant—Calculating Machine.
- Thomas Shaw—Spiral Exhaust Nozzle.
- 1878  
R. Dutton & Co.—Mowing Machine.
- William Farr Goodwin—New Mechanical Movement.
- D. K. Miller—Self-Locking Padlock.
- C. Seymour—Balance for Pulleys, Fly Wheels, etc.
- 1882  
H. Bilgram—Gearing for Metal Planers.
- B. H. Kemble—Wheel Hubs.
- 1883  
H. Ashford—Boat Attaching and Detaching Apparatus.
- J. Beecher—Hollow Handled Cutlery.
- Blodgett Bros.—Electric Signal Clock.
- Hugo Brehmer & Henry Rand Heyl—Wire Book Sewing Machine.
- H. G. Eckstein—Feed Water Heater.
- T. Hall—Typewriter.
- A. Nacke—Screw Cutting Attachment.
- Pratt & Whitney Co.—Taps and Gauges.
- Thomas Shaw—Friction Buffer.
- H. Whitall—Planisphere.
- 1884  
Joseph Bennor—Siphon Trap.
- John M. Burrell & C. E. Metzler—Railway Signal Lantern.
- G. M. Eldridge—Electro Magnetic Protector for Electrical Instruments.
- P. E. Jay—Automatic Anti-Freezing Valve.
- C. J. H. Woodbury—Testing Electric Light Mains.
- 1885  
C. Chabot—Shoe Sewing Machine (Also Cresson Medal).
- C. Chabot—Sole Channelling Machine.
- C. Chabot—Sole Edge Turning Machine.
- John Henry Doerr & William H. Wigmore—Sleeping Car.
- Morris L. Orum—Lock.
- Frederick Siemens—Regenerative Gas Burner.
- Orlands W. Spratt—Mercury Seal Trap.
- I. Townsend—Tent Slip.
- S. Wills—Journal Bearing and Car Axle-Box.
- 1886  
Edw. A. Callahan, Patrick B. Delany (Also Cresson Medal) & Paul LaCour—Improvements in Synchronous Multiplex Telegraphy.
- C. Chabot—Forming Bevelled Rims on Watch Cases.
- P. J. Grau—Feed Water Purifier and Heater.
- F. V. Greene—Extracting Oil and Albuminoid Matter from Corn.
- M. W. Hall—Duplex Steam Pump.
- L. Moser—Bohemian Glassware.
- L. J. Phelps—Induction Telegraph.
- Phoenix Iron Company—Automatic Cut-Off Steam Engine.
- Pratt & Whitney Company—System of Interchangeable Cut Gears.
- H. T. Yaryan—System of Evaporation in Vacuo.
- 1887  
H. Bilgram—Bevel Gear Cutter (Also Cresson Medal).
- Eugene H. & Alfred H. Cowles—Electric Smelting Furnace.
- D. Hallock—Weighing Scales.
- F. E. Ives—Isochromatic Photography.
- L. J. Marcy—Improvements in the Magic Lantern.
- L. H. Spellier—Electric Clock.
- 1888  
Cyclostyle Company—Cyclostyle.
- John Gates—Lubricator.
- C. J. Hexamer—Preventing and Extinguishing Explosive Fires in Grinding Mills.
- I. S. Hyatt—Pure Water System.
- A. E. Outerbridge, Jr.—Carbonizing Fabrics and Obtaining Castings therefrom.
- W. N. Woodruff—System of Keying for Machinery.
- G. W. Ziegler—Trestles and Scaffolding System.
- 1889  
R. Abt—System of Mountain Railways.
- J. Atkinson—Gas Engine.
- H. Y. Castner—Manufacture of Sodium and Potassium.
- T. A. Edison—Mimeograph.
- C. H. Koyl—Parabolic Semaphore.
- R. L. Maddox—Substitution of Gelatin for Collodion in Photography.
- A. A. Marks—Artificial Limbs.
- O. Mergenthaler—Linotype.
- T. Shaw—Instrument for Testing Ignitable Gases in Mines.



- C. A. Teal—Portable Hoist.  
 Elihu Thomson—Electric Welding.  
 O. C. White—Adjustable Extension Movement in Ball and Socket Joints; with protest against award.

1890

- W. H. Bristol—Recording Pressure Gauge.  
 W. L. Burton—Electric Heater.  
 A. C. Chenoweth—Electric Conduits.  
 C. J. Ehbets—Colts New Navy Revolver.  
 D. E. Felt—Comptometer.  
 A. Lopex de Haro—Electric Sea Compass; Automatic Electric Log Line.  
 J. Hellings—Mail Bag Fastening.  
 A. E. Hobson—Hydraulic Shaping Press.  
 F. E. Ives—Projecting Lantern and Appurtenances.  
 J. Lowe—Spinning Mule.  
 J. S. MacCoy—Pneumatic Tool.  
 C. McIntire—Electric Wire Connectors.  
 Luzerne Merket & Almer Thomas—Tempered Copper.  
 J. G. Meyers—Improved Mausoleum.  
 T. A. Richards—Ruling Machine.  
 W. H. Ridgway—Balanced Crane.  
 J. B. Root—"Spiral Weld" Tubing.  
 T. Van Kannel—Storm Door.  
 J. E. Wootten—Locomotive and Boiler.

1891

- W. Anderson—System of Water Purification.  
 Wallace H. Dodge—System of Rope Transmission.  
 R. P. Garrod—Annunciators.  
 G. M. Goetz—Goetz-Mitchell System of Anchoring Beams.  
 Sir Robert Hadfield—Manganese Steel.  
 J. B. Hannay & Alfred Shedlock—Lucigen.  
 Edward Hart—Acid Container.  
 W. Hart—Hoisting Machines.  
 E. H. Johnson—Interior Electrical House Conduit.  
 Francis LeClere—Toothed Gear Wheel.  
 A. J. Mason—Washer Punching Machine.  
 A. D. Pentz—Boring and Milling Engine.  
 F. A. Roeder & A. Springer—Torsion Balance.  
 J. G. Speidel—Hoisting Machines.  
 C. Stahlberg—Time Dating Stamp.  
 S. M. Vauclain—Truck Wheel Centres.  
 C. D. Williams—Revolving Show Window.

1892

- T. R. Almond—Angular Coupling.  
 J. Bennor—Knitting Machine.  
 G. D. Burton—Electrical Forging.  
 G. S. Clark—Device for Safety Vaults.  
 J. Emerson—Power Scale.  
 Fred L. Fuller & George H. Griswald—Cash Register and Indicator.  
 C. L. Gibbons—Improvement in Street Railway Construction.  
 J. R. Jones—Method of Axle Rolling.  
 Charles M. Lungren—Incandescent Gas Lamp.  
 Ezra S. McClellan—Anti-Siphon Vent.  
 Eugene Meylan & Camille S. Reckniewski—Electric Meter.

- Ephriam Shay—Patent Geared Locomotive.

1893

- F. R. Baldwin—Boiler Tube Cleaner.  
 W. Berkefeld—Germ Proof Water Filter.  
 H. L. Bridgman—Automatic Ore Sampler.

- D. W. Field & John E. Spencer—The Spencer Damper Regulator.  
 S. H. LaRue—Improved Stove for Soft or Bituminous Coal.

1894

- E. G. Acheson—"Carborundum."  
 W. C. Bramwell—Feeding Machine for Fibrous Material.  
 D. Branson, R. D. Thornburgh, J. E. Fuller & J. E. Starr—Refrigeration Process.  
 C. J. Cleborne—Bedstead.  
 Joseph N. Dunham & John McKemmil—Metallic Drawing Rolls.  
 J. B. Edson—Pressure Recording Gauge.  
 George F. Machlet & E. P. Reichhelm—System of Producing Fuel Gas.  
 W. F. C. Morsell—Application of Complementary Color Designs and Crystal Patterns.  
 C. Payen—Chloride Electrical Storage Battery.  
 N. W. Perry—Method of Series of Electric Traction.  
 F. Pontrichet—Black Print Process. "Heliographic Paper."  
 William D. & Samuel Priestman—The Priestman Engine.  
 Sigmund Riefler—Mercurial Compensation Pendulum of Sigmund Riefler.  
 F. S. Shuman—Wired Glass.  
 C. Spiro—Barlock Typewriter.  
 R. H. Tweddell—System of Applying Hydraulic Power to Mechanical Work.  
 H. P. Wiedig—Chemical Fire Extinguisher.  
 J. T. Wilkin—System of Generating and Forming Cycloidal Surfaces.  
 A. J. Wurts—Lightning Arresters and Non-Arcing Metal.

1895

- Albert J. Bates—Corliss Engine.  
 Clayton Beadle, Edward J. Bevan, Charles F. Cross—Cellulose Products.  
 A. Goldstein—Pneumatic Fire Alarm Telegraph System.  
 William Jandus—Incandescent Arc Lamp.  
 Thomas H. Stackhouse—The Diagraph.  
 Peter W. Willins—Steam Engine.

1896

- S. M. Balzer—Device for Backing Off and Forming Milling Cutters.  
 W. T. Carroll—Non-Metallic Bearings.  
 A. Crehore & G. O. Squier—Polarizing Photo-Chronograph.  
 G. B. Grant—Calculating Machine.  
 Edward P. Hopkins—Electric Arc Lamp.  
 A. L. Johnston—Bonding Joint for Electric Railways.  
 Edwin D. McCracken—Insulated Electrical Conductors.  
 M. Marsden—Corn-Pitch Cellulose.  
 Edward Milliau—Apparatus for Analyzing Fats and Oils.  
 H. S. Printiss—Automatic Calendar.  
 J. Richards—Solder for Aluminum.

1897

- T. R. Almond—Flexible Tube.  
 E. Berliner—"Gramophone."  
 E. Brown—Pyrometers.  
 W. S. Burroughs (American Arithmometer Company)—Calculating Machine.  
 G. B. Durkee & John F. Golding—Expanded Metal.  
 Francis LeClere—Black Printing Process.

- M. & L. E. Levy—Screens for Photo-Mechanical Engraving.  
 Henry G. Morris & Pedro G. Salmon—Automobile Vehicle (Electrobat).  
 A. E. Outerbridge, Jr.—Investigations in the Molecular Physics of Cast Iron.  
 W. R. Webster—Observations on the Relations between the Chemical Constitution and Ultimate Strength of Steel.  
 John N. Williams—Typewriting Machine.  
 1898  
 André Blondel & Spiridon Paarowdaki—Holophane Globes.  
 Frederick N. Connet & Walter W. Jackson (Clemens Hirschel received Cresson Medal)—Venturi Meter.  
 Daniel M. Cooper—Time Recorder.  
 Lt. B. W. Dunn—Testing Machine for Measuring Intensities of Impulsive Forces.  
 J. W. Hyatt—Roller Bearings.  
 H. C. Mueller—Process of and Apparatus for Manufacturing Mosaics.  
 Frank Reddaway—Camel Hair Belting.  
 H. L. Sayen—Improvement in Roentgen-Ray Tubes.  
 M. L. Severy—Severy Impression Process.  
 Alfred Steinbart & Edward Uehling—Pneumatic Pyrometer.  
 H. Willmunder—Swivel Loom.  
 1899  
 B. C. Batcheller—Pneumatic Dispatch Tube Apparatus.  
 E. R. Fellows—Machine and Cutter for Generating Gear Teeth.  
 Robert T. Fisher—Book and Letter Typewriter.  
 A. V. Groupe—Braiding Machine.  
 Morris Moskowitz—Improved System of Car Lighting.  
 A. Sexton—Slide Rule (Omnimeter).  
 Alfred Steinbart & Edward Uehling—Gas Composimeter.  
 1900  
 Chichester A. Bell & Summer Tainter (T. H. MacDonald received Certificate of Merit)—Apparatus for Recording Sound.  
 Reinhold Hakewessel & E. C. Henn—Automatic Screw and Metal Working Machine.  
 N. M. Hopkins—Pneumatic Cushioning of Water Pipes.  
 James Hough & Samuel Laughlin—Drawing Tables.  
 George A. Lowry—Cotton Baling Machine.  
 Magnus Swenson (American Cotton Co. received Cresson Medal)—Round Lap Bale System.  
 W. B. Wait—The Kleidograph, a Machine for Tangible Writing for Touch Reading.  
 1901  
 E. G. Acheson—Artificial Graphite.  
 J. B. Adt—Tobacco Machines.  
 C. F. Albert—Improvements in Musical Instruments.  
 American Prismatic Light Company—Light Projecting Glass.  
 Arthur F. Bardwell—Votometer.  
 Thomas W. Blakey & William Courtenay—Reconstructed Granite.  
 George C. Blickensderfer—Typewriting Machine.  
 Thomas Carney, H. Cook, J. H. & H. G. Patterson—Cash Registers.  
 J. D. Darling—Electrical Production of Metals and Nitric Acid from Fused Nitrates.  
 Edward J. Dobbins & George Moffatt—Light Projecting Glasses.  
 H. Dock—The Rivett-Dock Thread Tool.  
 Alfred J. Gillespie—Voting Machine.  
 A. L. Hahl—Pneumatic Clock.  
 Robert B. Haines, Jr.—Automatic Micrometer Rolling-Mill Plate Gauge.  
 F. A. Humphrey—Sawing Machine and Guide.  
 S. L. Kneass—Improvements on Injectors.  
 R. D. Mershon—Station Potential Indicator or Compensator.  
 Everett F. Morse—Drive Chains.  
 J. Richards—Balance for Testing White Metal Alloys.  
 P. W. Shimer—Combustion Crucible.  
 Elihu Thomson—Constant Electric Current Arc Light Transformer.  
 1902  
 Andrew J. Bradley—Stencil Machine.  
 Geo. M. A. Claud, Geo. A. Hess & Edmund Fouche—Process of Storing Explosive Gases.  
 Wm. J. Hammer—Long Distance Phonographic and Telephonic Sound Experiments between New York and Philadelphia.  
 Henry O. Herman—Star Ventilator.  
 J. D. Ihlder, A. C. Smith, August Sundh & Sidney Otis—Electric Elevator.  
 H. W. Leonard—System of Motor Control.  
 Wilfred Lewis, Harris Tabor & E. Mumford—Molding Machines.  
 P. M. Lincoln—Synchronism Indicator.  
 F. M. Rites—Governor System.  
 William S. Schellenbach—System of Gearing.  
 L. Stieringer—Improvements in the Art of Electric Illumination.  
 E. M. & Sydney B. Walsh—Method of Making Large Objects from Pieces of Adventurine.  
 Charles Wirt—Rheostat.  
 1903  
 H. J. Burger—Photo-Polychrome Printing Process.  
 W. A. Cross—Cross Horizontal Folding Door.  
 Joseph S. Duncan—Addressograph.  
 Arthur W. McCurdy—Apparatus for Developing Photographic Roll Films.  
 L. B. Mellor—Device for Measuring and Recording the Variable Diameter of Tubes.  
 E. F. Morse—Heat Gage.  
 J. Sachs—Enclosed Fuse Protective Devices.  
 C. M. Taylor, Jr.—Adsorption Process for Butter Making.  
 1904  
 J. A. Brill—Convertible Cars, "Eureka" Maximum Traction Truck.  
 Amos E. Burrows—Feed-Water Regulator.  
 Pearl T. & C. H. Campbell—Reconstructed Milk.  
 W. A. Doble—Tangential Water Wheel.  
 J. M. Dodge—Storage Structure for Coal and Analogous Material.  
 Zachary T. Furbish—Ratchet Tools.  
 J. A. Heany—Enclosed Arc Lamp.  
 F. E. Ives—Parallax Stereogram.  
 Evans W. Jones—Under-Feed Mechanical Stoker.  
 J. W. Lattig—Automatic Electric Semaphore Signal.  
 H. V. von Z. Loss—Manufacture of Solid Steel Railway Wheels by Hydraulic Forging with Subsequent Rolling.  
 Lee C. Moore—Wire Testing Machine.  
 H. B. Nichols & C. B. Voynow—Cast Zinc Joint for Rail Bonding.

Horace See—Hydro-Pneumatic Ash Ejector.  
F. Shuman—Concrete Pile for Foundations.  
S. S. Wheeler—Small Electric Buzz Fan.

1905

L. W. Downes—Fireproof Insulated Wire.  
Byron E. Eldred—Process for Flame Regulation.  
Dr. P. Frazer—Quantitative Colorimetry.  
Howard T. Hallowell—Shaft-Hangers.  
F. E. Ives—New Form of Replica of Rowland Diffraction Grating.

David T. Kurtz—Improved Cap Screws and Bolts.  
Nernst Lamp Company—Incandescent Lamp.

E. Parkinson—Knitting Machine.  
Prof. L. F. Rondinella—Photo Printing Machine.  
W. A. Rosenbaum—Automatic Hydraulic Letter Copying Press.

J. B. Semple—Shell Torch or Tracer.  
Dr. B. Walter—Schaltung, an Electric Switch.  
A. Wehnelt—Interrupter for Induction Machines.

1906

John M. Browning (Colt's Patent Fire Arms Mfg. Company received Longstreth Medal)—Automatic Pistols.

A. C. Chenoweth—Steel Concrete Foundation Piles.  
W. C. Heraeus—Fused Quartz Mercury Lamp.  
Frederick Palmer, J. R. Reynolds & J. P. Tirrell—Engine Stop and Speed Limit System.

C. J. Reed—Speed-Jack.  
M. E. Schmidt—Moving Platforms.

1907

C. Engelhard—Heraeus LeChatelier Pyrometer.  
Herman Frahm—Speed Indicator, Frequency Teller and Revolution Counter.

F. E. Ives—A New Color Meter.  
C. E. Sargent—Complete Expansion Gas Engine.  
L. H. Walter—Detection of Electrical Oscillations.  
Prof. R. W. Wood—Diffraction Color Photographs.

1908

W. I. Ballentine—Process of Testing the Hardness and Density of Metals and Other Materials.

J. Reagan—Improvements in Grate Bars.  
B. Talbot—Improvements in the Manufacturing of Steel.

1909

E. A. Colby—Electric Furnace for Melting Metals.  
Gustav Dietz—High Speed Photographic Between-Lens Shutter.

H. Ellis—Combined Calculating and Writing Machine.  
H. A. Herr—Liquid Extracting by Hydraulics Automatically.

Major R. Jewell, Timothy B. Powers & John F. Kelly—Telecric Piano Player.

D. McFarlan Moore—The Moore Light.  
Matthais Pfatischer—Improvement in Variable Speed Motors.

A. F. Shore—Scleroscope.  
F. J. Wetzel—Automatic Mechanical Stoker.  
C. F. Jenkins—Motion Picture Apparatus.

1910

Leo H. Baekeland—Bakelite.  
L. D. Lovekin—Device for Relieving Forces due to Inertia and Weight of Valve Gears.

J. W. Reno—Escalator, Inclined Elevator.  
A. A. Tirrill—Voltage Regulator.  
A. Welin—Life Saving Appliances on Board Ships.

1911

B. A. Behrend—High Speed Electric Generators.

1912

H. C. Alger—Liquid Measurer.  
Sherard Cowper-Coles—Process of Depositing Metals on Metallic Surfaces and Product.

M. A. McKee—Process of Treating Printing Plates.

1913

A. Higgins & C. Jacobs—Alundum Refractories.

1914

C. S. Batdorf—Coin Counting and Wrapping Machine.  
Alberto Cerasoli & H. A. Humphrey—The Humphrey Pump.

C. E. Guillaume—Alloy Invar.  
A. Atwater Kent—Unisparker, Ignition System.  
E. A. Sperry—Gyroscopic Compass.  
A. Spielman—Cloth Cutting Machine.

1915

H. N. Anderson—Gear Rolling Machines.  
H. E. Goldberg & J. C. Wahl—Adding Machine.  
H. W. Hardinge—Conical Pebble Mill.  
Clement F. Street—Locomotive Stoker.

1916

Carl E. Akeley—Cement Gun.  
John V. N. Dorr—Hydrometallurgical Apparatus.  
Hans Hanson & Frederick A. Hart—Combined Calculating and Typewriting Machine.

1917

Thomas Bilyeu (International Money Machine Company received Longstreth Medal)—International Money Machine.

Thomas A. McCall & J. H. Pillings—Automatic Typewriter (Received Longstreth Medal with Hooven, Owens, Rentschler Company).

Max Ulrich Schoop—Schoop Metal Spraying Process.  
Alfred Rishworth Tattersall—The "Midget" Marvel Flour Mill.

Lucien I. Yeomans—Method of Machine Construction.

1918

Conrad d'Huc Dressler—Dressler Tunnel Kiln.  
Frank P. Fahy—The Fahy Permeameter.

Ernest J. Sweetland—Sweetland Filter Press.

*Awards Made by the Advisory Committee to the  
Directors of City Trusts of Philadelphia,  
1920-1968*

1920

James Hartness, M.E., President, Jones and Lamson Machine Company. Invention of High Powered Machine Tools.

Edward C. Kandall, Ph.D., Biochemist, Mayo Foundation. Researches on Thyroxin.

Charles E. Kenneth Mees, D.Sc., Director, Research Laboratories, Eastman Kodak Company. Researches on the Structure of Photographic Images.

Hideyo Noguchi, M.D., Pathologist, Rockefeller Institute. Researches on the Cause and Prevention of Yellow Fever.

1921

Marie Sklodowska Curie, Professor in the Faculty of Science at Paris. Discovery of Radium and the Determination of its Radioactive Properties.

1922

William Duane, Ph.D., Professor of Biophysics, Harvard University. Distinguished for his Researches in Radio-Activity and of the Physics of Radium and of the X-Rays.

Thomas Osborne, Ph.D., Research Chemist, Connecticut Agricultural Experiment Station. Fundamental Studies on the Constitution of the Vegetable Proteins.

Reginald A. Fessenden, Consulting Engineer, Submarine Signaling Company. Distinguished for Invention of a Reception Scheme for Continuous Wave Telegraphy as distinguished from the Damped or Spark System used by Marconi.

Elwood Haynes, B.S., President, Haynes Automobile Company. Produced an Alloy consisting of practically Pure Nickel and Pure Chromium; also alloy named "Stellite." First to discover "Stainless Steel."

1923

Arthur L. Day, Ph.D., Sc.B., Director, Geophysical Laboratory, Carnegie Institute of Washington. Noted for the Organization of the Geophysical Laboratory of the Carnegie Institution. Also specially distinguished for his development in this country of fine Optical Glass, formerly derived only from Germany.

C. J. Eijkman, M.D., Professor of Hygiene, University of Utrecht, Holland. First produced experimentally a disease like beri-beri by feeding polished rice to chickens. This work has been applied to man and has called attention to an unrecognized element in food and started the study of dietary disease.

Francis William Aston, M.A., D.Sc., F.R.S., Fellow of Trinity College, Cambridge, England. Distinguished for his Development of the Mass-Spectrography and the use of it in the study of Isotopes.

Sir Joseph John Thomson, O.M., F.R.S., LL.D., Ph.D., D.Sc., Master of Trinity College and Professor of Experimental Physics, Cambridge, England. His most distinguished work consists of the Development of the Physics of the Electron and the Identification of it as the Atom of Negative Electricity.

1924

Frederick G. Banting, M.D., Physiologist. Researches leading to a Potent Extract of the Pancreas-Insulin.

William W. Coblenz, Ph.D., Physicist, Bureau of Standards, Washington. Thermopiles and Radiometers for Measuring Stellar radiation.

Elmer Verner McCollum, Ph.D., Sc.D., Professor of Biochemistry, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Maryland. Researches on Vitamins.

Ralph Modjeski, D.Eng., Civil Engineer, New York. Skill and Success in building of large bridges.

1925

William G. Mousekeeper, E.E., Research Physicist, Western Electric Co., New York. Method of sealing through glass metals having widely different expansion coefficients. Known as "Copper glass seal" and is gas tight.

Charles H. Morton, Inventor and Engineer, Worcester, Mass. Development of grinding and invention of apparatus for precision grinding.

Ross G. Harrison, Ph.D., M.D., Professor of Comparative Anatomy, Yale University. Method of Tissue Culture, etc.

Marshall A. Barber, Ph.D., Expert in Malaria Research, U. S. Dept. Public Health, Memphis, Tenn., and Robert Chambers, Ph.D., Professor of Microscopic

Anatomy, Cornell Medical College. Devices for the micro-dissection of living cells.

Orville Wright, Inventor. Development of Flying Machines.

1926

Ralph Earle, Educator and Engineer. 14" Naval Railway Gun Mounts and of Mine Barrage across the North Sea, used in World War.

Gustaf W. Elman, Physicist, Bell Telephone Laboratories. Permalloy and Its Application in Transmission of Messages.

Harvey C. Hayes, Ph.D., Research Physicist, Bureau of Engineering, U.S.N. Sonic Depth Finder and Other Submarine Signalling Devices.

1927

Dr. Alfranio do Amaral, Director, Antivenin Institute of America. Preparation of Antivenins.

Alfred F. Hess, M.D., Clinical Professor of Children's Diseases, Columbia University. Method of Producing a Vitamin Factor in Food by Ultraviolet Light.

Herbert E. Ives, Physicist, Bell Telephone Laboratories. Electrical Telephotography and Television.

Strickland L. Kneass, Engineer, William Sellers and Company, Inc. Exhaust Steam Injector.

Dewey DeForest Knowles, Physicist, Westinghouse Electric & Mfg. Co. Research Laboratories. Grid Glow Tube.

Peyton Rous, M.D., Pathologist, Rockefeller Institute. Devices and Development of a Filtration Technique for separation from Tumor Cells a Substance producing Sarcomain Fowls.

1928

Herbert M. Evans, M.D., Professor of Anatomy, University of California. Anti-Sterility Vitamin.

Thomas C. McBride, Mechanical Engineer, Worthington Pump and Machinery Corp. Locomotive Feed Water Heater.

William T. Bovie, M.D., Professor of Biophysics, Northwestern University Medical School. Development of an Electro-Surgical Apparatus.

Harold D. Arnold, Ph.D., Physicist, Bell Telephone Laboratories. Development of the Three-Electrode High Vacuum Thermionic Tube.

1929

Lee DeForest, Electrical Engineer. Audio used in Radio.

Carbon P. Dubbs, Chemical Engineer. Process for Economically Producing Gasoline on a Large Scale.

Allan Bartram Field, Consulting Electrical Engineer, Metropolitan-Vickers Electrical Co. Mathematical Paper on Eddy Currents in Large Slot-Wound Conductors.

Constantin Levaditi, M.D., and Robert Sazerac, M.D., Pasteur Institute. Joint Discovery of the Use of Bismuth in the Treatment of Syphilis.

Thomas A. Edison. Numerous Inventions.

1930

None

1931

Guglielmo Marconi, Inventor. Wireless Telegraphy. Samuel M. Vauclain, Mechanical Engineer. Manifold Improvements in Steam Locomotive.

Robert M. Temple, Inventor. Benjamin Franklin Dough Mixing and Kneading Machine.

Albert H. Emery, Inventor. A Mechanical Device for Testing Materials.

Orville S. Peters, Inventor. Electric Telemeter, a Recording Device for Noting the Stresses in Bridge Members, etc.

Albert Kingsbury, Engineer. Thrust Bearing for use in ships and heavy machinery.

Herbert T. Herr, Engineer. Miscellaneous Inventions and Discoveries in the Field of Reduction Gearing used in connection with the Turbo-Electric Drive; for the Air-Brake for Checking Speed of trains; for Improvements in Steam Turbine and Internal Combustion Engine.

Philip Drinker and Louis A. Shaw, Staff, Harvard School of Public Health. Apparatus for administration of Artificial Respiration.

Juan de la Cierva and Harold F. Pitcairn, Engineers. Invention of the Autogiro, its improvement and development as a propelling and stabilizing force for 'heavier than air' craft, and its introduction into America.

Willis H. Carrier, Engineer. Apparatus for Air Conditioning.

1932

Edward G. Budd, Engineer and Industrialist. A Novel Method of Welding, designated Shot Welding, of stainless steel, and its fabrication into structural members of very light weight and high sustaining power.

George H. Emerson, Mechanical Engineer. Water Tube Fire Box Boilers for Steam Locomotive.

W. L. R. Emmet, Consulting Engineer, General Electric Company. Mercury Vapor Boiler and its practical application for power purposes.

Dr. Joseph Slepian, Consulting Research Engineer, Westinghouse Electric & Mfg. Co. Discoveries in the Field of Deionization of Gases and Fundamental and Outstanding Inventions involving these discoveries.

1933

Dr. Frank Conrad, Engineer. Application of Short Wave Radio.

George Richards Minot, M.D., Professor of Medicine, Harvard University. Liver Cure in Pernicious Anemia.

C. R. Nesson, H. L. Galson, H. C. Heller, H. K. Steinfeld, Engineers. Production of the De la Vergne Air Conditioning Apparatus.

1934

Dr. Robert F. Mehl, Director of Metals Research Laboratory, Carnegie Institute of Technology. Radiography of Metals.

Dr. A. Newton Richards, Professor of Pharmacology, University of Pennsylvania. The Function of the Kidneys.

Dr. Nikola Tesla, Engineer. Polyphase System of Generating, Transmitting, Distributing and Utilizing Electricity.

1935

None

1936

Charles F. Kettering, Engineer, General Motors Corporation. Invention of the First Electrical-Mechanical Self Starter for use in connection with automobiles.

George S. Kelley, Mechanical Engineer. Invention of the Kelley Dust Trap used in the Prevention of Silicosis.

James Ewing, M.D., Director of Memorial Hospital for Cancer and Allied Diseases, N. Y. Pioneer work in classifying tumors, which discovery has been of incalculable value in the treatment of malignant growths.

1937

Dr. Evarts A. Graham, School of Medicine, Washington University. Application of the X-Ray in the treatment of the gall bladder.

Dr. W. D. Coolidge, Director, Research Laboratory, General Electric Company. Application of New Principle in X-Ray Tubes.

Dr. Irving Langmuir, Research Laboratory, General Electric Company. Physical-Chemical discoveries resulting in improved incandescent lamps.

1938

Wendell M. Stanley, M.D., Associate Member, Division of Plant Physiology, Rockefeller Institute for Medical Research. Isolation of the Tobacco Mosaic Virus in Crystalline Form.

Edwin H. Land, Research Engineer, Polaroid Corporation. Invention of a Substance designated "Polaroid."

1939

None

1940

None

1941

Owen H. Wangenstein, M.D., Professor of Surgery, University of Minnesota. Development of Syphonage Treatment of Intestinal Obstruction.

1942

Major Edwin H. Armstrong, Electrical Engineer, Columbia University. Work in Frequency Modulation in Radio.

Dr. Robert R. Williams, Chemist. Work on Thiamin (vitamin B1).

Vice Admiral Samuel Murray Robinson, Engineer, Naval Bureau of Ships. Outstanding work in Warship Design and Construction.

Dr. Arthur Hoyt Taylor, Engineer, Naval Research Laboratory. Important researches in Application of Radio to Naval Purposes.

1943

Walter E. Dandy, M.D., Johns Hopkins University. Development of Ventriculography.

Dr. Vannevar Bush, Head of Office of Scientific Research and Development, Washington, and Prof. Samuel H. Caldwell, Massachusetts Institute of Technology. Development of the Differential Analyzer.

John C. Garand, Chief Engineer Ordnance, Springfield (Mass.) Armory. Invention of the U. S. Rifle Cal. .30 M1.

Chevalier Jackson, M.D., Honorary Professor of Broncho-Esophagology, Temple University. Devising Instruments and Methods Useful in Bronchoscopy.

Dr. Richard E. Shope, Research Worker, Rockefeller Institute. Discovery of the Complex Etiology of Swine Influenza.

Dr. Otto Stader, Veterinary Surgeon. Invention of the Reduction and Fixation Bone Splint.

1944

Sir Alexander Fleming, Kt., Professor of Bacteriology, University of London. Discovery of Penicillin.

## 1945

- Dr. Lyle D. Goodhue, Chemist, U. S. Dept. of Agriculture, and Captain William N. Sullivan, Jr., Entomologist, U. S. Dept. of Agriculture. Invention of Aerosol Insecticides.
- Dr. Edwin J. Cohn, Dept. of Chemistry, Harvard Medical School. Methods of Yielding Separated Blood Proteins of Therapeutic Value.
- Dr. Ernest W. Goodpasture, Professor of Pathology, Vanderbilt University. Growth of Viruses in Chick Embryos.
- Dr. William E. Doering and Dr. Robert B. Woodward, Research Laboratory, Polaroid Corporation. Total Synthesis of Quinine.
- Dr. George H. Shull, Professor Emeritus of Genetics, Princeton University. Origination of Hybrid Corn.

## 1946

- Dr. Donald W. Kerst, Professor of Physics, University of Illinois. The Betatron or Induction Electron Accelerator.

## 1947

- Dr. Florence B. Seibert, Associate Professor of Biochemistry, The Henry Phipps Institute. Development of the Purified Protein Derivative of Tuberculin.

## 1948

- Dr. Merle A. Tuve, Director, Carnegie Institution of Washington. Development of Proximity Fuze.
- Prof. Morris S. Kharasch, Professor of Chemistry, University of Chicago. Development of Organic Mercurial Seed Disinfectants.

## 1949

- Frank W. Caldwell, Director of Research, United Aircraft Corp. Development of Controllable Pitch Propeller.
- Harry T. Bennett, Chief Chemist, Mid Continental Petroleum Corp. Stabilization of Cracked Gasoline.
- Dr. LeRoy G. Story, Associated with Swift & Company. Stabilization of Cracked Gasoline.
- Dr. Charles Glen King, Scientific Director, The Nutrition Foundation, Inc. Isolation and Identification of Vitamin C.
- Dr. Selman A. Waksman, Professor of Microbiology, Rutgers University. Discovery and Development of Streptomycin.

## 1950

None

## 1951

- Dr. James F. Couch, Chemist in Charge of Tobacco Section, U. S. Dept. of Agriculture. Invention of a process for the extraction of rutin from buckwheat.
- Dr. Roy J. Plunkett, General Superintendent, Organic Chemicals Dept., E. I. duPont de Nemours & Co. Invention of Polytetrafluoroethylene.

## 1952

- Dr. Glenn T. Seaborg, Professor of Chemistry, University of California. Discovery and invention of the Transuranium Elements—Plutonium, Americium, Curium, Berkelium and Californium.
- Dr. Louis Alvarez, Professor of Physics, University of California. Invention of the Ground Control Approach Radar Landing System.

## 1953

- Eugene T. Houdry, Inventor and Scientist. Inventions in the Catalytic Cracking Process for the Refining of Petroleum.

- Dr. John H. Gibbon, Jr., Professor of Surgery and Director of Surgical Research, Jefferson Medical College of Philadelphia. Invention of the Heart-Lung Apparatus.

## 1954

- Dr. Robley C. Williams, Professor of Biophysics, University of California. Invention of a method of depositing thin metal films by thermal evaporation which has found practical application in mirror coatings for astronomy and in electron microscopy.
- Professor Vincent du Vigneaud, Professor of Biochemistry, Cornell University Medical College. For the synthesis of the important posterior pituitary hormone, oxytocin.
- Mr. Marvin Camras, Research Physicist, Armour Research Foundation of Illinois Institute of Technology. Invention of the method and means of obtaining distortion-free magnetic recording through high frequency bias.
- Professor John Bardeen, Professor of Physics & Electrical Engineering, University of Illinois, and Dr. Walter H. Brattain, Physicist, Bell Telephone Laboratories. Invention of the transistor.
- Mr. Igor I. Sikorsky, Engineering Manager, Sikorsky Aircraft, Div. of United Aircraft Corp. Invention of the first practically useful single sustaining rotor helicopter.
- Mr. John B. Powers, Staff, Dept. of Agriculture, University of California. Invention of a color sorter for fruits and vegetables.

## 1955

- Mr. Edgar S. McFadden, Agronomist, Agricultural Experiment Station, Texas A. & M. Origination and development of the first rust-resistant bread wheat.
- Dr. Harry F. Olson, Director of the Acoustical and Electro-mechanical Research Laboratory, RCA Laboratories, Radio Corporation of America. Invention of the velocity microphone.
- Professor Jesse W. Beams, Francis Henry Smith Professor and Chairman, Department of Physics, University of Virginia. Inventions in the field of centrifugation and particularly for his invention of the magnetically supported centrifuge.

## 1956

- Dr. Daniel Swern, Supervisor, Animal Fats Section, Agricultural Research Service, U.S.D.A. For the invention and subsequent development of epoxidized fatty compounds which are used as stabilizing plasticizers for Vinyl Plastics.
- G. L. Pearson, Physicist, D. M. Chapin, Electrical Engineer, and C. S. Fuller, Chemist, Bell Telephone Laboratories. Invention of the Bell Solar Battery.

## 1957

- Jonas E. Salk, M.D., Professor of Bacteriology, University of Pittsburgh. Invention of the Salk Polio-myelitis vaccine.
- Air Commodore Sir Frank Whittle, K.B.E., C.B., F.R.S., Aeronautical Engineer. Invention of the first practical Turbo-Jet Engine.
- Dr. Glenn W. Burton, Principal Geneticist, Georgia Coastal Plan Experiment Station, University of Georgia College of Agriculture. Invention of Coastal Bermuda Grass.



1958

Eric L. Holmes, Consulting & Research Chemist, and Basil A. Adams, Chemist. Invention of the first practical synthetic ion exchange resins and their application.

Renato Dulbecco, M.D., Professor, Dept. of Biochemistry, California Inst. of Technology. Invention of a method of production of plaques with animal cells.

Dr. Wise Burroughs, Professor of Animal Husbandry, Iowa State College. Invention of Estrogen Usage in cattle and sheep feeds.

A. J. P. Martin, F.R.S., Chemical Consultant. Inventions in chromatography and particularly vapor phase chromatography.

1959

Prof. John T. Randall, F.R.S., Wheatstone Professor of Physics, King's College, University of London, and Dr. Henry A. H. Boot, S.R.D.E., Baldock, Hertfordshire, England. Invention of the Cavity Magnetron.

Dr. Dean A. Lyon. Self-employed Physicist. Invention of Dicumarol and of the method of extraction.

Dr. Karl P. Link, Professor, Dept. of Biochemistry, University of Wisconsin. Invention of method of producing the first practically useful optical coating for the reduction of light reflection.

1960

Wallace H. Coulter, Head of electronic equipment firm. Invention of the Coulter fine particle counter and size analyzer.

Prof. Frank A. Forward, Head of Mining and Metallurgy Dept., Univ. of British Columbia. Invention of the Forward process for extracting nickel and other metals from ore concentrates.

F. C. Williams, O.B.E., D.Sc., D.Phil., M.I.E.E., F.R.S., Electrical Engineering Laboratories, University of Manchester, England. Invention of the super regenerative responder and other inventions in the radar responder field.

1961

Dr. E. F. Knipling, Director, Entomology Research Division, U.S.D.A., Maryland, and Dr. R. C. Bushland, Investigations Leader, Livestock Insects Investigations, U.S.D.A., Texas. Invention of a method of eradicating screw worms and other destructive insects by eliminating reproduction through the rearing and release of sufficient sterile male flies.

J. Presper Eckert, Jr., Remington Rand Univac, Blue Bell, Pa., and Dr. John W. Mauchley, President, Mauchley Associates, Ambler, Pa. Invention of the first large scale electronic computer.

1962

J. W. Sparke, Royal Aircraft Establishment, Hants, England. Invention of the RAE Visual Glide Path Indicator.

Dr. Horst Bickel, Professor of Pediatrics, Universitäts-Kinderklinik, Marburg, Germany, Professor John Gerrard, Professor of Pediatrics, University of Saskatchewan, Canada, and Miss Evelyn Hickmans, Castlecroft Gardens, Wolverhampton, England. Invention of a method of controlling Phenylketonuria.

1963

Professor Giulio Natta, University of Milan. Invention of a process for making stereo regular (or isotactic) hydrocarbon Polymers.

Professor R. L. Wain, University of London. Invention of a group of weed killers known as "Butyric" weed killers.

Professor Oliver H. Lowry, Washington University (St. Louis). Invention of a method of isolating, preparing, weighing and chemically studying single nerve cells and sub cellular particles.

Provost Charles H. Townes, Massachusetts Institute of Technology. Invention of the Maser.

1964

Mr. Hal O. Anger, University of California, Berkeley. Invention of the Positron Scintillation Camera.

Professor John C. Sheehan, Massachusetts Institute of Technology. Invention of the Total Synthesis of Penicillin and certain analogues of Penicillin.

Mr. Chester W. Carlson, New York. Invention of the Xerox process.

Professor H. A. Schachman, University of California, Berkeley. Invention of the Split Beam, Automatic, Photo-electric Absorption Optical System for the Ultra Centrifuge.

1965

Professor Alexander Kolin, University of California. Invention of the Electro Magnetic Flow Meter.

Sir Howard Florey, London, England. Inventive development and establishment of Penicillin as a Therapeutic Agent in Medicine.

Dr. John Guthrie and Mr. Wilson A. Reeves, New Orleans, La. Invention of the Tetrakis (Hydroxymethyl) Phosphonium Chloride Process for Flame Proofing Cellulosic Textiles.

Dr. Frank T. McClure, Johns Hopkins University, Md. Invention of the Satellite Doppler Navigation System.

1966

Dr. Romald E. Bowles, Bowles Engineering Corp., Silver Springs, Md., Mr. Billy M. Horton, Director, Harry Diamond Laboratory, Washington, D. C., and Mr. Raymond W. Warren, Harry Diamond Laboratory, Washington, D. C. Invention of Fluid Amplifiers.

Dr. Jean Hoerni, Fairchild Camera & Instrument Corp., Mountain View, Calif. Invention of the Planar Process—a method of achieving true dimensional surface passivation of semiconductor devices as an integral part of the basic manufacturing process.

1967

Paul M. Zoll, M.D., Associate Professor of Clinical Medicine, Medical School of Harvard University, Cambridge, Mass. Invention of the Heart Pacemaker.

Professor Humberto Fernández-Morán, Professor of Biophysics, University of Chicago, Ill. Invention of the Diamond Knife.

Professor Edwin T. Mertz and Dr. Oliver E. Nelson, Dept. of Botany and Plant Pathology, Purdue University, Lafayette, Ind. Invention of the First High Quality Protein Corn.

1968

Professor Edward W. Davis, #1 Kent Lane, Silver Bay, Minn. Inventions Leading to the Economic Recovery of Iron from Taconite Ore.

Christopher S. Cockerell, 13 Ardnave Crescent, Bassett, Southampton, Hampshire, England. Invention of the "Ground Effects Machine" known as the Hovercraft.