THE JOURNAL "SCIENCE" AND THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

AT the April, 1925, meeting of the executive committee of the council of the American Association for the Advancement of Science, the editor and owner of SCIENCE offered under certain conditions to let the journal, which since 1900 had been the official organ of the association, become its absolute property. The plan was approved by the executive committee, which unanimously voted "its sincere and hearty thanks to Dr. Cattell for his most generous offer." The agreement was put in contractual form by Dr. Roscoe Pound, dean of the Harvard Law School, one of the most distinguished fellows of the association, originally elected for his contributions to botany. The contract was executed by the owner of SCIENCE and Dr. Pupin, president of the association, and attested by Dr. Livingston, permanent secretary, on July 28, 1925. It was approved by a unanimous vote of the council of the association on December 30, and a committee, consisting of Drs. Pupin, Kellogg and Livingston, was appointed to express to Dr. Cattell the appreciative thanks of the association. The full text of the agreement is as follows:

This Agreement made and entered into this 25th day of July, A. D. 1925, by and between James McKeen Cattell, of Garrison-on-Hudson, in the state of New York, and the American Association for the Advancement of Science (hereinafter referred to as the Association), a corporation organized and existing under the laws of the Commonwealth of Massachusetts.

Witnesseth:

Whereas at the regular spring meeting of the Executive Committee of the Association, held in the city of Washington, in the District of Columbia, on or about the twenty-fifth day of April, 1925, the said Cattell presented to the said Association a memorandum of offer with respect to the acquisition of the weekly journal devoted to the advancement of science, edited by the said Cattell and known as SCIENCE, which memorandum was in the words and figures following, to wit:

> "It is agreed and contracted between the American Association for the Advancement of Science, incorporated in the state of Massachusetts, and James McKeen Cattell, of Garrison, New York, that on the death of the latter or on his relinquishment of the control of the weekly journal SCIENCE for any cause, the journal shall become the absolute and unencumbered property of the Association on the following conditions, namely: (1) That the present arrangement between the Association and the journal, or some other arrangement adopted by mutual agreement, is at the time in effect; (2) that should Josephine Owen Cattell (who for over thirty years has cooperated in the editorial and business conduct of the journal) survive the acquirement of the journal by the Association, she shall be paid annually during her life one-half the average annual net profits of the journal during the five years preceding its acquirement, and (3) that the arrangements for editing, publishing and printing the journal in effect at the time of the acquirement of the journal by the Association shall be continued so long and in so far as this is consonant with the interests of the Association."

And whereas upon consideration of said memorandum of offer the Executive Committee of said Association, duly empowered in that behalf, unanimously approved of the proposals of the memorandum and authorized the President and Permanent Secretary of the said Association to enter into a contract and agreement with the said Cattell accordingly, and unanimously voted its sincere and hearty thanks to Dr. Cattell for his most generous offer.

Now therefore it is hereby covenanted and agreed by and between the parties aforesaid as follows:

1. The said Cattell agrees that should he at any time relinquish the control of the said journal for any cause he will in consideration of the several covenants and agreements of the said Association hereinafter set forth make over and convey said journal, the good-will thereof, and all things thereunto appertaining to the said Association, so that the said journal shall become the absolute and unencumbered property of the Association, subject, however, to the conditions hereinafter set forth.

2. Said Cattell further agrees in consideration of the several agreements and covenants of the said Association hereinafter set forth that should he, the said Cattell, retain control of said journal down to the time of his death, his personal representatives within a reasonable time after his decease shall make over and convey said journal, the good-will thereof and all things thereunto appertaining to the said Association, so that the said journal shall become the absolute and unencumbered property of the said Association, subject, however, to the conditions hereinafter set forth.

3. In construing the foregoing paragraphs, accounts payable but not yet due, and subscriptions not yet filled, shall not be deemed encumbrances. On taking over the said journal said Association shall take over all outstanding accounts due to the journal, and shall be liable for all outstanding obligations, but the payments of the Association on account of subscriptions of the members by virtue of any contract or arrangement then existing between the Association and said Cattell shall be pro rated so that the Association shall receive its proportional share of any subscriptions paid in advance.

4. The said Association in consideration of the foregoing covenants hereby agrees and covenants to and with the said Cattell that in case Josephine Owen Cattell (who for over thirty years has cooperated in the editorial and business conduct of the journal) should survive the acquirement of the journal by the said Association, the said Association shall pay or cause to be paid to her annually in quarterly installments during her life a sum

equal to one half of the average annual net profits of the said journal earned during the five years next preceding its acquirement. The amount of such profits shall be determined from the books of account kept and used in the business of conducting said journal, provided, however, that should any dispute or controversy arise as to the amount of such profits, such dispute shall be submitted to arbitration by three arbitrators, one to be appointed by the said Cattell, or his personal representative, one by the said Association, and a third by the arbitrators so chosen, and it is hereby covenanted and agreed that the arbitration of such controversy or dispute by said arbitrators or a majority thereof shall be final and binding upon the parties hereto and their representatives.

5. The term "average net profits" in the preceding paragraph shall be construed to mean the average excess if any of receipts of said journal from all sources over and above the cost of printing and publication thereof. But the cost of publication shall not include any payment for the time given to the journal by said James McKeen Cattell or said Josephine Owen Cattell, and in estimating the cost of publication the outlays of the Science Press for office rent, business management, and like overhead expenses, shall be pro rated in proportion to the expenses of the several publications published by said Press, and the proportion thereof chargeable on that basis to said journal SCIENCE shall be deemed part of the cost of publication thereof.

6. The said Association covenants and agrees to continue the arrangements for editing, publishing and printing the said journal which shall be in effect at the time said journal is acquired by the Association under the terms hereof for a reasonable time after such acquisition, and so long and in so far thereafter as is consonant with the interests of the said Association.

7. The covenants and agreements heretofore entered into by the said Cattell are made and entered into subject to the following express condition, to wit, that at the time of relinquishment of control of said journal by said Cattell, or if he shall be in control thereof at the time of his death, then at the time of his death the present arrangement between the said Association and the said Cattell or some other arrangement adopted by mutual agreement shall be in effect.

In witness whereof the said Cattell has signed and sealed these presents, and the said Association has caused these presents to be signed by its President and attested by its Permanent Secretary, and has caused its corporate seal to be thereunto affixed the day and year first above written. Executed in duplicate.

JAMES MCKEEN CATTELL

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

M. I. PUPIN,
President

Attest:

BURTON E. LIVINGSTON,
Permanent Secretary

Witness:
RODNEY H. TRUE
JOHN KAYGANOVICH

SCIENCE was established in 1883 by A. Graham Bell with the cooperation of Gardner G. Hubbard, the father of Mrs. Bell. The telephone was patented in 1876, and seven years later Mr. Bell wisely and generously used part of the profits from that great invention to found a weekly journal of science. There were at that time but few scientific journals in the United States. *Silliman's Journal,* established in 1818, occupied a historic position, but had become special and limited in its scope. The *Scientific American,* first published in 1846, was concerned chiefly with invention and popular technology. *The American Naturalist* had been founded in 1867 by A. S. Packard, E. S. Morse, Alpheus Hyatt and F. R. Putnam. The *Popular Science Monthly* had been established in 1872 by Dr. W. T. Youmans and the Appletons. We had no publication of the general type of *Nature,* founded in England in 1869.

There had been published in New York during 1881 and 1882 a weekly devoted mainly to physical science and invention entitled *Science,* and Mr. Bell purchased from Mr. John Michels for $5,000 the title and good will of this journal. Continuity of publication was not, however, maintained, and the present journal dates from 1883. Mr. Thomas A. Edison had been responsible for the foundation of the earlier *Science.* He wrote in 1925: "If you will look back at your earliest records, you will find that SCIENCE was originally started and financed by me, and was published for about a year, when I withdrew. . . . When I could not finance the publication further, I paid his [the editor's] salary in full and told him he could have the paper and do what he pleased with it." We thus owe the establishment of a weekly journal of science to the two American men of genius who have done the most for the applications of science to human welfare.

The ownership of SCIENCE was vested in The Science Company, organized under the laws of Massachusetts, with a capital of $25,000, most of which was contributed by Mr. Bell and the balance by Mr. Hubbard. The directors, in addition to Mr. Bell and Mr. Hubbard, were Daniel C. Gilman, president of the Johns Hopkins University, who was president of the company; Othniel C. Marsh, of Yale University, and Samuel H. Scudder, president of the Boston Museum of Natural History. There were later added to the board Simon Newcomb, of the Nautical Almanac; J. W. Powell, of the U. S. Geological Survey, and W. P. Trowbridge, of Columbia University. Mr. Scudder, the distinguished entomologist, who lived at Cambridge but was not connected with Harvard University, was the editor. The publisher was Moses King, and the first number was issued at Cambridge on February 9, 1883.

This number contains a short contribution by S. P. Langley on photographing the corona without an eclipse and longer articles on a meteor and on a typhoon. There is a review by Asa Gray, followed by correspondence and notes, including abstracts of recent contributions to science. The second number opens with an appreciation of Henry Draper by Charles A. Young and contains articles by Dr. Ira Remsen and H. Newell Martin. In subsequent issues and volumes will be found contributions from nearly all Americans who have led in scientific research.

SCIENCE was issued in editions of from six to ten thousand and attained a subscription list of about 1,500. It was, however, found difficult to obtain advertising. The publication was far from self-supporting and Mr. Bell and Mr. Hubbard contributed in all over $80,000 for its maintenance during the early years. Mr. Scudder retired from the editorship in 1885 and was succeeded by N. D. C. Hodges, the office of publication being removed from Cambridge to New York.

The journal continued to maintain good scientific standards, but there were financial difficulties, and the ownership was transferred to Mr. Hodges, though Mr. Bell continued to assist with gifts. In 1887 the page was changed to a large quarto size and the journal became less satisfactory to scientific men. Mr. Hodges used all possible efforts to secure the cooperation of some educational institution or scientific society. At its meeting in 1893 a subsidy of $750 was voted by the American Association for the Advancement of Science and Mr. Bell agreed to give $500. It might or might not have been better if at that time the American Association had been prepared to acquire the ownership of SCIENCE. Mr. Hodges found it impossible to continue the journal, and publication was suspended with the issue of March 23, 1894.

SCIENCE was purchased from Mr. Hodges by the present owner and editor in 1894, and publication was resumed on January 4, 1895, all unexpired subscriptions being filled. An editorial committee, representative of the several sciences and of different institutions, was formed consisting of S. Newcomb, mathematics; R. S. Woodward, mechanics; E. C. Pickering, astronomy; T. C. Mendenhall, physics; R. H. Thurston, engineering; Ira Remsen, chemistry; Joseph Le Conte, geology; W. M. Davis, physiography; O. C. Marsh, paleontology; W. K. Brooks, invertebrate zoology; C. Hart Merriam, vertebrate zoology; N. L. Britton, botany; Henry F. Osborn, general biology; H. P. Bowditch, physiology; J. S. Billings, hygiene; J. McKeen Cattell, psychology; Daniel G. Brinton, J. W. Powell, anthropology. To this committee in order to cover the medical sciences and to fill vacancies caused by death (there have been no others) there were later added Charles D. Walcott, geology; C. S. Minot, embryology; L. O. Howard, entomology, and William H. Welch, pathology. Subsequently, the vice-presidents of the American Association for the Advancement of Science and still later members of the executive committee of the council were made members of the editorial committee. As a matter of fact the responsible editor has had the cooperation of practically all American men of science.

The first number of the new series of SCIENCE opens with introductory articles by Simon Newcomb and D. C. Gilman, and there are contributions by Daniel G. Brinton, then president of the American Association; G. Brown Goode, T. C. Mendenhall, J. W. Powell, C. Hart Merriam, Samuel H. Scudder, R. S. Woodward, A. S. Packard, H. W. Conn and N. L. Britton. The editorial standards of the first number have been maintained to the latest issue.

The subsidies promised by the American Association for the Advancement of Science and by Mr. Bell to Mr. Hodges were paid during the first year, but no gifts or subsidies have since been received or sought. As may be supposed the financial conduct of the journal was by no means easy and it has only become self-supporting in recent years. In this connection acknowledgment should be made to the printers, The New Era Printing Company of Lancaster, Pa., and especially to Mr. Andrew Hershey. In 1893 they were printers of a local newspaper and of local job work. They offered terms much lower than any city printers and maintained the same rates for SCIENCE for twenty-five years. They proved themselves to be excellent printers and in 1920 were printing some fifty scientific journals. After one partner had died and the other two had advanced in years, the business was sold to a promoter, not himself interested in printing. Charges were greatly increased and the printing became less efficient.

Efforts were made to purchase the printing plant with cooperative ownership by the scientific journals that it printed, but these failed, partly because the $300,000 asked included at least $100,000 for the good will in large measure given to the business by SCIENCE, and partly owing to the difficulties of ownership by the societies and institutions that controlled the journals. When the Carnegie Institution was established in 1902, the editor of SCIENCE proposed the organization by it of an office for scientific printing and engraving which could have been made self-supporting, and, as in the case of the Oxford and Cambridge presses, would have rendered valuable service by assured continuity and expertness in scientific printing; but the plan was not adopted.

SCIENCE and the other journals of The Science Press were for a time printed in Utica, N. Y. In 1923 The Science Press Printing Company was incorporated with its office at Lancaster and with the cooperation of Mr. A. E. Urban as general manager and of those compositors, pressmen and proofreaders who had given that city distinction as a center for scientific printing. This company is now responsible for printing SCIENCE and a considerable number of other scientific journals, monographs and books.

Space is given here to the question of printing, for, while there is now discussion of the economic control of history, most scientific men may not realize the difficulties involved in printing and publishing a scientific journal. The editorial contents are open pages for commendation or criticism, and that may seem to be the whole story. Business men who control newspapers and magazines have more information and a different attitude. As much time has been given to the publication and printing of SCIENCE as to the editorial conduct, and the work has been more difficult and more irksome.

During 1895 SCIENCE was published at Lancaster, Pa., and Garrison, N. Y., with an office at 41 East Forty-ninth Street, New York, which was then the address of Columbia University. From 1896 to 1907, inclusive, the journal was published by The Macmillan Company, who assumed the cost in view of the value to them of the advertising space. It is, however, difficult for a large publishing company to publish a journal that it does not own; in 1908 the publication was taken over by The Science Press, a registered trade name. Scientific men should realize their obligations to The Macmillan Company, as well as to The New Era Printing Company, for maintaining the publication of a weekly scientific journal under difficult economic conditions.

In 1900 SCIENCE became the official journal of the American Association for the Advancement of Science. The agreement was made at the summer meeting in New York City by a committee consisting of Simon Newcomb, G. K. Gilbert, R. S. Woodward, James Lewis Howe and L. O. Howard, who had recently been elected permanent secretary of the association. By the arrangement SCIENCE published the official notices and proceedings of the association and was sent to members in good standing at a cost to the association of $2 each. The annual dues of the association were $3, and no increase was necessary owing to the ever enlarging membership of the association through the arrangement with SCIENCE and to the admirable conduct of its affairs for more than twenty years by Dr. Howard, followed by the notably successful administration of Dr. Livingston.

The subscription price of SCIENCE was $5 and most subscribers naturally became members of the association, which then began the growth in membership and influence which it has since maintained. The book membership at the beginning of 1900 was 1,721, but the names had been kept on the rolls of those who had not paid their dues for years and the actual membership was about 1,200. The largest recorded membership had been 2,033 in 1883, after which there had been a gradual decline, not checked even by the Boston anniversary meeting of 1898 with an attendance of 903.

Within two years after the arrangement by which SCIENCE was sent to members of the association the membership more than doubled. In 1909 it had increased to over 7,500; it is now about 14,000. SCIENCE also profited on the editorial side, for it was a great advantage to have more readers, the subscribers now numbering about 11,000, and the total number of readers being much larger. It does not, however, follow that the financial situation of the journal was improved. It is perhaps sometimes taken for granted that SCIENCE is supported by the association; it would be equally true to say that the association is supported by SCIENCE, the journal having always been supplied to members at considerably less than the actual cost of printing, paper and postage. The expenses of publication have been met by libraries and other subscribers who paid the regular rates and by advertisements.

The financial gain to the journal has been in the increase in the value of the advertising space from the larger subscription list, but it is difficult to obtain advertising for a journal with a limited circulation and without an organized advertising department, so there was not a great deal of advertising and it was necessary to charge it nearly at cost. The situation, however, changed at the end of the war, when for various reasons advertising increased everywhere, and the president and trustees of Columbia University had made it feasible for more time to be given to the business conduct of the journal. Not only SCIENCE, but also those who read it and even those scientific men who may not read it but none the less profit from its existence, are under real obligations to the advertisers who make its publication possible. The advertisements are a matter of business, more profitable it may be hoped to the advertisers than to the journal, but none the less they are thus cooperating with scientific men in advancing their common interests, which are also the interests of the nation. Many subscribers have expressed the opinion that they find the advertising pages one of the most interesting and useful departments of SCIENCE.

The cooperation between the American Association and SCIENCE has certainly been a benefit to scientific organization. There has been no increase in dues to

members, except from $3 to $5, to make up for the depreciated dollar, the journal since 1920 receiving $3 for each subscriber, an increase of 50 per cent. to meet increased costs of printing, paper and postage of about 100 per cent. If SCIENCE is compared with *Nature,* the *Revue Scientifique* or *Naturwissenschaften,* it should be remembered that the subscription rates of these journals are much higher. SCIENCE certainly need not shun comparison with the French and German weeklies; in the case of *Nature* the domestic subscription rate is £2.12, about $12.60. As prices in general are lower in England than here (wages and salaries being about two thirds) the cost of *Nature* is relatively at least five or six times that of SCIENCE. This makes it possible to issue a journal about 50 per cent. larger and to pay adequately for editorial conduct and contributions, but it may be doubted whether American men of science would care to pay $15 to $18 for a weekly journal, and the smaller circulation would be a serious drawback to its usefulness.

In 1909 members of the American Association were given the option of receiving by request *The Popular Science Monthly,* now *The Scientific Monthly,* in place of SCIENCE. This was a serious disadvantage to SCIENCE, as its circulation was decreased and the advertising space made less valuable. It also involved a financial loss to the *Monthly,* as subscribers became members of the association without expense to them, but at the cost of the journal, and there were practically no advertisements in it to gain by an increased circulation. However the circulation of *The Scientific Monthly* is now over 9,000 and efforts are being made this year to obtain advertisements. The option was doubtless useful to the association as it increased the membership and gave those who wanted it a less technical magazine and one that might be read at home or placed in the office by those who have access to SCIENCE in a library, club or laboratory. In many instances husband and wife or father and son are or might be members of the association and would not want two copies of the same journal.

There has been discussion of a magazine for members of the association still more popular in character than *The Scientific Monthly,* but unless there were a very large increase in membership it would not be feasible to give such low rates with alternatives among several journals. It appears also that it would scarcely be desirable for the association to enter on the difficult undertaking of a magazine more popular in contents than the lectures and general interest sessions of the annual meetings. If such a magazine is feasible it lies in the field of Science Service, an endowed institution for the popularization of science, a majority of whose trustees are nominated by the American Association, The National Academy and the National Research Council.

A number of leading American scientific journals have been established and conducted under private auspices and have become later the publications of national scientific societies. To mention only the most recent instance, the *Psychological Review* and its associated publications, established by Professor J. Mark Baldwin and the present editor of SCIENCE in 1894, have this year become the property of the American Psychological Association. It has always been the hope of the editor and owner of SCIENCE that, in the interest of the journal, of the American Association for the Advancement of Science and of science in America, the journal should ultimately be owned and conducted by the association. This is assured by the contract here printed.

In reference to the reservation of an annuity to Mrs. Cattell in case she should survive the transfer of the ownership of SCIENCE to the association, it should be made clear that this is only a small return for invaluable services, not in any sense a gift either from the association or from the present owner. Although there were seven children, none of whom had a nurse or governess or attended school until he went to college, Mrs. Cattell has devoted some ten hours a day, not excepting Sundays, to the editorial and business conduct of SCIENCE and of other publications later acquired or established. The situation is fortunately such that the larger the annuity, the more readily can it be paid by the association and the greater the value of the property that it acquires without other cost.

The editor of SCIENCE has by force of circumstance led a multiple life; in consequence he has done nothing so well as he would have liked. He may look back with regret to the paleontological era when he was able to give ten hours a day to psychological experiments, for there is no sport more absorbing than scientific research. But the advancement of science is not only a fascinating game of commingled skill and chance; it is the greatest single factor in promoting human welfare. It is the business of the scientific man to contribute to the progress of science in the way that he best can. Under modern conditions the miner can dig up the gold only as the result of a complicated organization both before and after. The gold is only of value when it is put to use. Freedom of research and teaching, the intellectual, personal and economic integrity of the man of science and the teacher, must be maintained at any cost to the individual. Fortunately efforts on their behalf are one of the few undertakings that is nearly as interesting as scientific research.

For two years, beginning in the summer of 1924, the editor's eldest son, Dr. McKeen Cattell, while engaged in physiological teaching and research, assisted in the editing of SCIENCE, thus permitting the editor to attend as president of the American Association the meeting of the Pacific Division and later to spend two months in Europe. Otherwise he has not been absent from the office (though on several occasions it moved with him) for a longer interval than about a week and then only to attend scientific meetings. The editor made up every issue of the journal for thirty years, obtained most of the articles printed, decided on the disposition of every manuscript submitted, and prepared practically all the notes. As there was no possibility of paying for contributions the undertaking has not been easy. The contents of the journal may not always have been as interesting or as timely as would have been desirable, but the editor hopes that they have maintained high scientific standards, freedom of speech with decency of expression and impartial treatment of institutions and individuals. SCIENCE is perhaps the only publication in any country that may be regarded as a professional journal for scientific men as a class. Perhaps the chief satisfaction of the editor is that he has never had the slightest personal controversy or difficulty with any one of the thousands of scientific men with whom there have been relations. He especially appreciates their unanimous support of SCIENCE at a time when his views on war and conscription were not shared by most of them, and when the president and trustees of Columbia University made charges as serious as they were absurd.

The editor of SCIENCE has personally small use for charity or philanthropy. These may be needed as temporary expedients, but it would surely be better if scientific men could conduct their researches, their institutions and their publications as masters of the situation rather than as suppliants for aid. Only enlightened selfishness is involved in the transfer of SCIENCE to the American Association. The father wants his child to be cared for when he can no longer look after it himself. Although the editor of SCIENCE is but one of fourteen thousand members of the American Association, it and its objects have long been one of his chief interests, he being chairman of the executive committee of the council and having been a member of this committee and of its predecessor, the committee on policy, for twenty-five years. He has devoted his life in the main to the objects that the journal and the association are there to promote and he is thus doing the best he can to preserve SCIENCE for his enduring self.

These remarks are printed after hesitation and with reluctance. If there is any one who is familiar with the some 50,000 pages of SCIENCE issued in the course of the past thirty-two years, he can bear witness to the fact that personal references and appeals for aid have been lacking. The only excuse that can now be offered for a departure from this policy is that a psychologist and an editor knows the risk of leaving an obituary notice to others.

However these things may be, we may hope that the contract according to which SCIENCE will be owned and conducted by the American Association for the Advancement of Science will ensure a good journal of science and an influential association of scientific men. Both the journal and the association are means to an end, namely, the advancement of science, which is the most fundamental concern of modern civilization. Under the circumstances it may be reasonable to look not only for the continued cooperation of scientific men, but for their united efforts in the editorial and financial support and betterment of a journal that belongs to them.

J. MCKEEN CATTELL

THE RELATION BETWEEN THE COST OF RESEARCH AND THE COST OF PUBLICATION

As chairman of the sub-committee on publication of the Committee of One Hundred on Research, of the American Association for the Advancement of Science, it has occurred to me that it might be of interest to find out approximately the relation between the amounts spent for research and the cost of the publication of the results. For this purpose I addressed a letter to each author of a paper in the *Journal* of the American Chemical Society or in *Industrial and Engineering Chemistry* for the April issues of the current year, asking for an approximate estimate of the cost of the article, including:

(a) That portion of your salary during the period when you were working on the research, which you think may fairly be charged as a part of the expense of the preparation of the article.

(b) Any special expense incurred for equipment or materials.

(c) The proportional part of the cost of the upkeep of your laboratory which might reasonably be charged as a part of the cost.

The response has been very cordial and general. Twenty authors of papers in each journal gave me their estimates:

For the *Journal* of the American Chemical Society the estimates covered 172 pages, with a total of $26,138. This is $152 per page.

For *Industrial and Engineering Chemistry* the estimates covered 151 columns, with a total of $46,352, or $307 per column.