

Editor's Note: *Pharmacological Reviews* in Review

The first issue of *Pharmacological Reviews* was published in April of 1949—50 years ago next month. As part of the celebration of our “Golden Anniversary”, I asked Bob Stitzel, the previous editor of *Pharmacological Reviews*, to provide us with his perspective of the development of our journal and significant related issues. He graciously agreed to do so, and his editorial follows.

Fifty Years of *Pharmacological Reviews*: A Historical Perspective¹

"In order to further the growth of pharmacology and experimental therapeutics in this country and to facilitate personal intercourse among investigators in these branches of science, we hereby organize the American Society for Pharmacology and Experimental Therapeutics and subscribe ourselves thereto as its founders."

John J. Abel and six of his colleagues (1908)

The history of *Pharmacological Reviews* is best understood against the background of the history of American pharmacology itself, as well as in the context of the life of one of the most important figures in our discipline, Dr. John Jacob Abel. Dr. Abel helped found the American Society for Pharmacology and Experimental Therapeutics and its flagship journal, the *Journal of Pharmacology and Experimental Therapeutics (JPET)*. Abel foresaw the need for a review journal relatively early in the history of the discipline, and when *Pharmacological Reviews* came into being 11 years after his death, it was recognized immediately as an important means of strengthening communication among scholars within the expanding field.

Dr. Abel received his M.D. degree from Strasbourg University in 1888, where he obtained an unusually broad and solid training under several of the best-known medical scientists on the continent (Holmstedt and Liljestrand, 1963). Two years later, on the recommendation of Oswald Schmiedeberg, the most prominent pharmacologist of his time, Dr. Abel was appointed to the chair of *Materia Medica and Therapeutics* at the University of Michigan and then, in 1893, to the first chair of Pharmacology in the United States at the Johns Hopkins Medical School. Among his most important research accomplishments were an examination of the chemistry and subsequent isolation of the active principals from the adrenal medulla (a monobenzoyl derivative of epinephrine) and the pancreas (crystallization of insulin). He also examined mushroom poisons, investigated the chemotherapeutic actions of the arsenicals and antimonials, conducted studies on tetanus toxin, and designed a model for an artificial kidney. In a letter to Dr. C. Edmunds, Dr. Abel wrote that "I was given the opportunity of starting the first professorship of phar-

macology in the United States, whose holder should devote himself entirely to giving students the best possible instruction . . . [and] all my energy that was not given to this kind of instruction to students was directed to research work and to arousing the enthusiasm of others for it".

Founding the American Society for Pharmacology and Experimental Therapeutics in Baltimore in 1908 was John Jacob Abel's first step in his plans to develop and strengthen the discipline of pharmacology in the United States. Abel was elected as the first president and Reid Hunt was named secretary of the young society.

During the organizational meetings of December 28 and 29 of 1908, it was decided to establish an English-language journal devoted to publishing the results of pharmacological research. Previously, most pharmacological studies appeared only in journals in which German was the language of research. Dr. Abel used his persuasive powers to convince Mr. Passano of the Williams & Wilkins Company to work with him in establishing a new pharmacologically oriented publication in the United States: the *Journal of Pharmacology and Experimental Therapeutics*. Dr. Abel assured Mr. Passano that there was a substantial audience for such a publication and that the journal would survive financially. It was agreed that Dr. Abel would be the initial owner of the journal and that he would give it to the newly created society once its and the journal's future success were ensured. With Dr. Abel providing the driving force, ASPET and *JPET* soon became widely accepted, especially because the journal published articles that examined basic pharmacological research, as well as articles that connected laboratory research and clinical findings. Within 3 years a number of foreign collaborators were added to the Editorial Board, thus demonstrating Dr. Abel's vision that pharmacology was an international science.

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When Dr. Abel turned *JPET* over to the Society on April 9, 1933, he told the assembled members that he believed a review journal should be founded, particularly one that would be devoted to the integration and critical analysis of the increasing number of research articles that were appearing in many new areas of pharmacology. But 14 more years were to elapse before Abel's suggestion was considered seriously.

After World War II, in part as a result of the forces exerted on both the chemical and the blossoming pharmaceutical industries by the demands of the war, there occurred a tremendous expansion of new pharmacological information. Following the discovery and subsequent mass production of penicillin in the early 1940s, the demand for new antibacterial agents and antibiotics became particularly acute. It soon became imperative that the United States, as well as countries worldwide, train increasing numbers of individuals who understood those approaches to scientific discovery that have always been the particular concern of pharmacologists, e.g., dose-response relationships, structure-activity relationships, and pharmacokinetic principles. As more and more pharmacologists were being trained and hired, there was an increased need to provide an outlet for the knowledge that resulted from their research. In 1946–7, partly in response to this challenge, a committee of the ASPET Council examined opportunities for strengthening the publication activities of the Society with a particular emphasis on establishing a new journal that would be devoted to summaries and evaluations of the rapidly growing fields of scholarship by the very authors who were primarily responsible for the new research, i.e., a review journal.

In May 1947, the ASPET Council, acting on the recommendations of the aforementioned subcommittee, asked Dr. Maurice SeEVERS, the then-current Society president, to create a Board of Publications Trustees (BPT), one of whose jobs would be to evaluate the tasks necessary to establish a review journal (Chen, 1969). This newly founded Board suggested amendments to the ASPET charter that would 1) establish Society publication policies, 2) control the finances of all ASPET journals, and 3) elect a managing editor for each journal controlled by ASPET. The subcommittee also recommended the founding of a new journal that would complement *JPET* but that would have a review format. These amendments both establishing a permanent Board of Publications Trustees and creating a review journal, *Pharmacological Reviews*, were approved on March 16, 1948. The creation of *Pharmacological Reviews* proved to be the first major project brought to fruition by the newly organized BPT. In July of 1948, Dr. McKen Cattell, one of the early dominant figures in ASPET, wrote to Dr. Louis S. Goodman (Cattell, 1948) thanking him for agreeing to accept the position of Editor-in-Chief of the Society's new review journal. Dr. McKen expressed to Dr. Goodman his belief that "Your

qualifications will assure the success of what I regard as perhaps the most important venture in the Society's history".

The initial issue of the new journal (Cattell et al., 1949) was published as a second part of Volume 95 (see Fig. 1) of *JPET*, although it bore its own banner, "*Pharmacological Reviews*". This issue contained the following four articles: 1) "Metabolism of Adrenaline" by Z. M. Bacq, 2) "Pharmacology of Adrenergic Blockade" by Mark Nickerson, 3) "Interactions of Drugs and Plasma Proteins" by Avram Goldstein, and 4) "Anticholinesterase Drugs" by Alfred Gilman and George Koelle. The new review journal was welcomed by the biomedical research community almost from the beginning as evidenced by the early rapid growth in both personal and institutional subscriptions. This enthusiastic greeting assured the BPT that the new journal could stand on its own financially and convinced them to establish *Pharmacological Reviews* as a "stand-alone" journal. The latter creation made its appearance in 1951 and bore the volume number of 3.

Ten of the first 11 articles appearing in the first volume (1949) dealt with either the cardiovascular or the

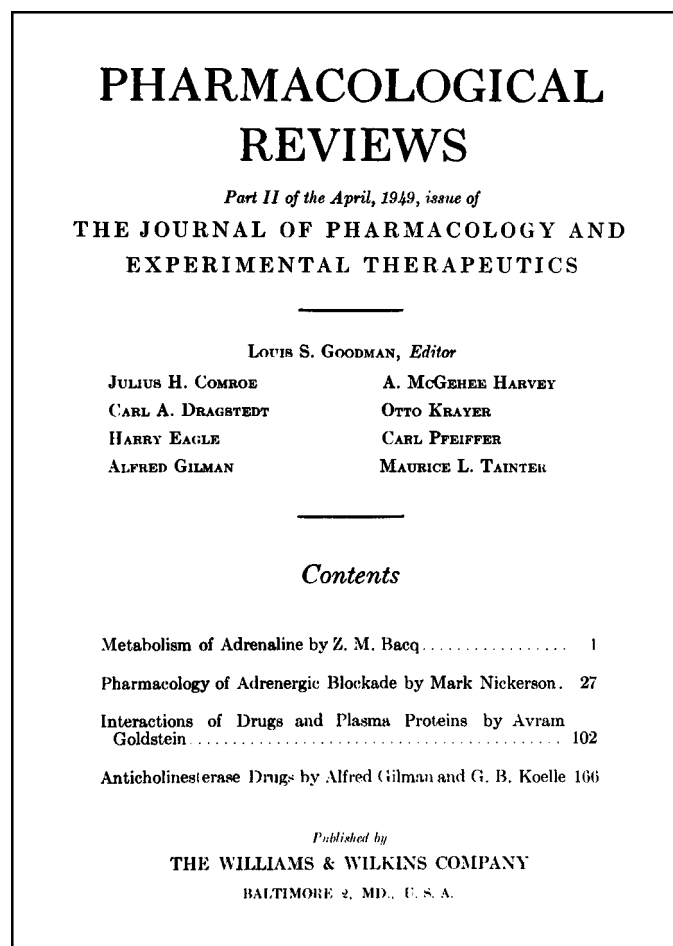


FIG 1. Title page of the first issue of *Pharmacological Reviews*. It was contained within the Volume 95 (1949) issue of the *Journal of Pharmacology and Experimental Therapeutics* where it first appeared as a new journal.

PHARMACOLOGICAL REVIEWS

An international publication sponsored
by the
American Society for Pharmacology and Experimental Therapeutics
the British Pharmacological Society
and the Scandinavian Pharmacological Society

VOLUME 2, NUMBER 1

appearing as part II of the April, 1950, issue of

THE JOURNAL OF PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS

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Published by

THE WILLIAMS & WILKINS COMPANY
BALTIMORE 2, MD., U. S. A.

FIG. 2. Contents page from Volume 2 (1950) of *Pharmacological Reviews*, indicating the additional societal sponsorship and hence the international nature, of this new journal. This volume, like its immediate predecessor, was published as part II of the *Journal of Pharmacology and Experimental Therapeutics*. Included in the journal was a note to librarians regarding binding instructions: "*Pharmacological Reviews* is paginated separately from the *Journal of Pharmacology and Experimental Therapeutics* of which it is presently a part. The editorial boards of the two parts are also separate. It is suggested that *Pharmacological Reviews* be bound, as volumes, separately from the *Journal of Pharmacology and Experimental Therapeutics*".

nervous system. By comparison, in the 1998 volume we find that of the 24 individual reviews, 11 of the them deal with aspects of the cardiovascular and nervous system, however, the focus of those articles is on a more molecular level. Five of those articles deal with the nomenclature of neurotransmitters and their receptors and six discuss signal transduction mechanisms found associated with cardiovascular or neural sites. Of the remaining articles in the 1998 volume, five study drug effects on individual organ systems, four examine as-

pects of drug metabolism, one evaluates the toxicological actions of drugs, one reviews the therapeutic potential of gallium, one relates to molecular chaperones, and another reports on drug effects on the complement system. Although the fields being reviewed in 1998 clearly now show a trend toward the examination of subcellular interactions of drugs with biological macromolecules, it is equally clear that, broadly defined, many research areas that occupied the interests of the earlier pharmacologists remain of interest today.

At a time (February, 1949) when plans for the establishment of *Pharmacological Reviews* were well underway, Sir John Gaddum of the British Pharmacological Society independently began a discussion of the need for a review journal in pharmacology. It was his desire that such a journal would emerge as a joint venture of the British, Scandinavian, and American pharmacology societies. Because the first issue of *Pharmacological Reviews* was already scheduled to appear in April of 1949, ASPET and the BPT felt that they had no choice but to go ahead with its publication. However, as early as its second volume (Fig. 2), *Pharmacological Reviews* invited the sponsorship of the two European societies. They were asked to participate in all editorial functions of the new review journal, with Drs. Gaddum and Weatherall representing the British Pharmacological Society, and Dr. Jacobsen representing the Scandinavian Pharmacological Society. This editorial arrangement still exists today, although there is now an Editorial Board member from each of the four largest Scandinavian countries. Additional international representation has been added in recent years with the appointment to the Editorial Board of scientists from Australia and Japan.

The first Editor-in-Chief was Dr. Louis Goodman of the United States who served in this capacity through the first six volumes of *Pharmacological Reviews* (1949–53). A complete listing of the editors of *Pharmacological Reviews* is found below (from Cline, 1997).

EDITOR AND TERM

Louis S. Goodman, 1949–53
Otto Krayer, 1954–59
George B. Koelle, 1960–62
George H. Acheson, 1963–69
Marion De V. Cotton, 1970–77
Paul L. Munson, 1977–81
James A. Bain, 1982–88
Robert E. Stitzel, 1989–94
David B. Bylund, 1995–present

Each editor was chosen by the BPT for his ability to meet the challenge of selecting, and often predicting, what would be the new and emerging fields in pharmacology. Under the leadership of these editors, *Pharmacological Reviews* has expanded its reputation for publishing in-depth scholarly reviews of the most important current topics in the pharmacological sciences. In this regard, it is noteworthy that many Nobel Prize winners

have published in *Pharmacological Reviews*, some having written several articles over the years. Distinguished authors appearing in the pages of *Pharmacological Reviews* (with the year of their Nobel Prize in parentheses) include: Otto Loewi (1936), Henry H. Dale (1936), Corneille Heymans (1938), Carl Cori (1947), Julius Axelrod (1970), U. S. Von Euler (1970), Earl Sutherland (1971), Sune Bergström (1982), Rita Levi-Montalcini (1986), George Hitchings (1988), Gertrude Elion (1988), Ferid Murad (1998), Louis Ignarro (1988), and Robert Furchgott (1998).

One problem appears to have plagued *Pharmacological Reviews* from the beginning. Although many members of the pharmacological community have surmised that delays in receiving and subsequently publishing review articles is a relatively recent occurrence, perhaps due to the increased demands placed on active scientists who were trying to juggle grant writing, laboratory research work, and commitments to various journals, it is quite apparent from reading some of the early correspondence of *Pharmacological Reviews* editors that they also were faced with problems of timeliness of submission. For example, Arnold Welch at Western Reserve University anticipated this problem when he offered advice to the new editor of *Pharmacological Reviews*, Dr. Louis Goodman, on July 19, 1948 (Welch, 1948) stating that "Although it may ordinarily be the custom to give an author a period as long as a year. . . we are all hoping that this might not be necessary". On July 15, 1953 we find Otto Kraye writing to Dr. Goodman (Kraye, 1953) shortly after the former took over as Editor-in-Chief saying "I am, of course, very much in favor of publishing the material which will come from the Symposium on Neurohumoral Mechanisms in the *Pharmacological Reviews*. It seems to be a windfall that will perhaps solve some of our difficulties with regard to backlog." Based on my own editorial experience, I do not anticipate that future editors will be free of the same anxiety that each previous editor faced as publication deadlines draw near.

Of course, no history of *Pharmacological Reviews* could be complete without acknowledging the important and valuable contributions made by all of the individuals who have served on the Editorial Board of *Pharmacological Reviews* over the years. These scientists have given their time and their guidance to the editors, con-

tributed articles themselves, and, often using their considerable powers of persuasion, have been able to obtain reviews from some of the most distinguished scientists in the arena of biomedical research. Additionally, thanks must be extended to all those scientists who have willingly given of their time to review the submitted manuscripts and made suggestions for their improvement. The journal is most grateful because without their contributions *Pharmacological Reviews* could never have achieved the international reputation it presently enjoys.

It has been a personal pleasure to have spent time examining the early history, as well as some of the correspondence between the major figures of our discipline who, during the last 50 years, were involved in establishing what is generally considered to be one of the premier journals in all of the biological sciences. Articles published in *The Scientist* over the years have demonstrated that *Pharmacological Reviews* has often ranked either first or second in impact of *all* journals in the life sciences, and not just among review journals. As a former editor of *Pharmacological Reviews*, I am confident that the future editors of our journal will continue to successfully anticipate and publish the most important analyses and discussions of new pharmacological research well into the next millennium.

On the 50th anniversary of the publication of *Pharmacological Reviews* I would like to say: Congratulations! Cheers! Lycka Till!

Acknowledgment. I would like to extend my sincere thanks to my colleague and former editor of *Pharmacological Reviews*, Dr. James Bain, for reading this manuscript and making exceptionally helpful suggestions. Although retired, Jim has not lost his critical editorial eye.

REFERENCES

- Cattell M (1948) Letter to L.S. Goodman, July 12, 1948, in, Archives of the American Society for Pharmacology and Experimental Therapeutics.
- Cattell M, Bodansky O, Ferguson JKW and others, Editors (1949) *J Pharmacol Exp Ther* **95**:part 2.
- Chen KK, editor (1969) *The American Society for Pharmacology and Experimental Therapeutics, Incorporated: The First Sixty Years, 1908–1969*. Amer Soc Pharmacol Exp Ther, Bethesda.
- Cline WH, editor (1997) *Pharmacologist* **39**:173.
- Holmstedt B and Liljestrand G, editors (1963) *Readings in Pharmacology* pp. 331–333, Macmillan, New York.
- Kraye O (1953) Letter to LS Goodman, July 15, 1953, in Archives of the American Society for Pharmacology and Experimental Therapeutics.
- Welch A (1948) Letter to LS Goodman, July 19, 1948, in, Archives of the American Society for Pharmacology and Experimental Therapeutics.

ERRATUM

In the article “Fifty Years of *Pharmacological Reviews*: A Historical Perspective” by Robert E. Stitzel (vol. 51, 1, 1999), on page 6, in the left column, line 10, the year Louis Ignarro received the Nobel Prize is incorrectly noted. The correct year is 1998. This typographical error was reported by Dr. Stitzel to the compositor, but a correction was not made. We apologize for this oversight.