

REVIEW OF REVIEWS¹

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Reviews of pharmacological interest continue to increase in number and in significance. Often they are the most satisfactory way by which busy members of the health professions can keep up with the flood of new information on drugs and their mechanisms of action, their metabolism, and their toxicity.

It is important, then, for reviewers of pharmacological reports to write clearly and concisely, so that members of the health professions may readily comprehend what verifiable information about drugs is now available. In-group jargon is an unfortunate affectation. Reviewers of pharmacological information would be wise to avoid it. Reviewing of scientific information, like any other literary effort, is a fine art, and it deserves to be cultivated as such.

Annual Review of Pharmacology affords the easiest and least expensive way of keeping abreast of the vast accumulation of information on drugs which occurs each year. The surveys in it indicate the broad-ranging scope of the science, covering as they do the ever growing information on the interaction of chemical compounds with living material from macromolecules such as genes and viruses, through subcellular units, cells, organs and tissues, individuals, and societies, to ecological complexes.

Pharmacology is now important not merely for the practice of medicine, but for all the health professions and services, as well as for agriculture, agronomy, economics, engineering, environmental control, law, criminology, sociology, and politics. Competent reviews of pharmacological information remain the most satisfactory way by which concerned people can keep abreast of it all.

GENERAL

Methodology is arousing increasing interest among pharmacologists. Chignell edits 14 reviews on physical methods used in pharmacology ranging from fluorescence spectroscopy to heat-burst microcalorimetry, and including electron spin resonance,

¹This review was completed July 1, 1973, for material available at that time. References are cited at the end of the chapter, by author, without numbering. Names are arranged alphabetically for convenience.

nuclear magnetic resonance, X-ray diffraction, and mass spectrometry. Clarke edits data books on isolation and identification techniques with toxicological information on over a thousand drugs, with 450 infrared spectra for a variety of complex compounds. Florey offers analytical profiles of drug substances. Schwartz edits 18 reviews on current methods of studying nerve and nerve-muscle preparations, the use of microelectrodes, and techniques for examining contractile proteins, microsomal enzyme systems, and myocardial metabolism.

Controversies over methods used in clinical pharmacology and drug development are reviewed in discussions edited by Palmer. The psychiatric complications of commonly used drugs (including placebos) are surveyed in twelve reports edited by Shader. Using 167 references, Yesair, Bullock & Coffey review the pharmacodynamics of drug interactions, cautioning against multiple drug use. A helpful survey of fetal pharmacology is edited by Boreus. This includes considerations of drug distribution by placenta, fetal vascular shunts, fetal drug metabolism, and equilibration.

Biographical sketches of great pharmacologists are ever of interest. Fishman tells about Henry Dale (1875–1968) and acetylcholine. Golikov gives an account of S. V. Anichkov and his pupils at the Institute of Experimental Medicine in Leningrad. Raffel gives a well-deserved account of Windsor Cutting (1907–1972).

SOCIAL PHARMACOLOGY

The social implications of psychotropic drugs are well discussed by Berger. The social aspects of alcoholism are well reviewed by Kissen & Begleiter in the fourth volume of their comprehensive treatise on the biology of alcoholism. Milner considers the effects of various drugs on drivers of automobiles, with much on alcoholic beverages.

Drug abuse screening programs are outlined by Kaistha, with details on field tests and social implications. Siargh, Miller & Lab edit two volumes of reviews on drug addiction, the first dealing with pharmacological mechanisms and the second covering sociolegal aspects. Stewart surveys drug abuse in industry, with emphasis on prevention. Mills & Brawley review the psychopharmacology of *Cannabis sativa*.

McCawley, Hart & Crowe recommend a national advisory review committee to aid clinical investigators of drugs. Moxley, Yingling & Edwards offer reasons for the review of over-the-counter drugs by the Food and Drug Administration. Maronde and colleagues report on prescription data processing for the control of drug abuse.

Matties concludes that drug influences on teaching and memory are mostly inhibitory. Vesell reviews environmental and genetic factors affecting human drug responses. Wolff & Wasserman call for study of potential hazards of nitrates, nitrites, and nitrosamines added to foods.

ABSORPTION, FATE, AND ELIMINATION

In a couple of his neat "Vignettes in Nuclear Medicine," Brucer gives a sharp critique of pitfalls in estimating gut absorption by radioactive preparations. Cooks-

ley & Powell review hepatic enzymes in regard to biotransformation of drugs, including induction and inhibition, and effects of liver disease. Hartiala reviews the metabolism of hormones and related drugs by the gut. Hausch points out quantitative relations between lipophilic properties of a drug and its metabolism. O'Reilly reviews the pharmacokinetics of drug metabolism. Wagner concludes that bioavailability, or rapid absorption, is a large factor in the therapeutic activity of drugs.

Several reviews refer to the absorption, fate, and elimination of specific drugs. Thus Christensen surveys the biological fate of decamethonium, while Juchau & Horita review, with 85 references, the biotransformations of hydrazine derivatives. Hirom and colleagues review molecular weight and chemical structure as factors in the biliary excretion of sulphonamides. Kimrich reviews coupling between sodium and sugar transport in the small bowel. Ling & Ochsenfeld survey the control of cooperative absorption of solutes and water in body cells by hormones, drugs, and metabolic products. Massry & Coburn review the hormonal control of renal excretion of calcium and magnesium. Sullivan reviews oxygen transport in mammals.

ANTISEPTICS AND CHEMOTHERAPY

Finland reviews studies on antibacterial drugs. Lucey introduces a symposium on use of hexachlorophene as an antiseptic in nurseries, in which it was agreed that it controls staphylococcal infections, with hazards not significant relative to its value. Pittin carefully reviews mechanisms of bacterial resistance to antibiotics. Raab surveys "Natamycin" (pimaricin) as a broad spectrum antifungal antibiotic of effectiveness and safety. Thompson & Werbel offer a comprehensive review of useful antimalarial drugs, emphasizing chemistry, effects on parasites, and effects on hosts.

AUTONOMIC NERVOUS SYSTEM

Bell offers a full review, with 856 references, of autonomic nervous control of reproduction, emphasizing circulatory factors influencing both male and female functions. Blaschko & Muscholl edit 20 reviews of various aspects of catecholamine pharmacology. With 582 references, Burnstock well reviews purinergic nerves, with much relating to adenosine triphosphate formation, release, and inactivation. New vistas, some 33 of them, on monoamine oxidases are edited by Costa & Sandler. Cotten edits 17 reviews of catecholamine metabolism in the sympathetic nervous system.

In a review, with 393 references, on drug action on adipose tissue, Fain gives evidence for adrenergic receptors on fat cells, with catecholamines as stimulators of lipolysis, activators of adenylate cyclase, and stimulators of cyclic AMP accumulation, with many drugs from amytal to xanthines affecting these actions. Harrison edits eight reviews of the circulatory effects and clinical uses of β -adrenergic blocking drugs. Wong & Schreiber review the metabolism (by oxidative deamination) of β -adrenergic blocking agents. Odell moderated a symposium on clinical aspects of catecholamines. With 102 references, Smith reviewed subcellular localization of noradrenaline in sympathetic neurons. Higgins, Vatner & Braunwald, with 328

references, reviewed the parasympathetic control of hearts, detailing mechanisms of action of acetylcholine in relation to catecholamine release and sympathetic modulation, with adrenergic activity in right ventricles and cholinergic in left.

CENTRAL NERVOUS SYSTEM

Anesthesia

With physicochemical data from Veda and colleagues on firefly enzymes, Eyring updates the reversible protein denaturation theory of anesthesia of Claude Bernard (1814–1878). In reviewing neurophysiological effects of general anesthetics, Clark & Rosner find that fluorine adds to the central nervous system irritability of general anesthetics. Dundee, Forrester & Simpson chaired sections in a conference on a steroid intravenous anesthetic agent, althesin, dealing with laboratory and clinical pharmacology, and with clinical experiences. Metabolic aspects of halothane-liver relations are reviewed by Dykes and associates, while Ross & Cardell survey the effects of halothane on the ultrastructure of rat liver cells. With 67 references, Seeman offers a comprehensive review of the responses of membranes to anesthetics and CNS depressants. Especially interesting are sections on membrane expansion and fluidization.

Tricyclic Antidepressants

Blackwell and associates review dose-response relations between the anticholinergic action of tricyclic antidepressants and mood. Fournier surveys poisoning due to tricyclic antidepressants, while Lambert reviews their many undesirable side effects, and Pichot covers the criteria for the evaluation of their effects in humans. Simon reviews preclinical studies on them, while Tillement analyzes their pharmacokinetics. Schmutz offers a general review of their actions and uses.

General

Burns opened a symposium on L-dopa in parkinsonism, while Malitz edited 9 essays on its behavioral effects. Furchgott edited 3 keen reviews on effects of drugs, chiefly stimulants, on behavior. A new antidepressant, butriptyline HCl, was the subject of a symposium opened by Lippman, while Spencer opened one on oxyperline, another anti-anxiety agent. Van Praag introduced a symposium on amphetamine derivatives.

Chemical modulation of brain function is the subject of a volume of 20 essays edited by Sabelli and dedicated to J. E. P. Toman.

The clinical pharmacology of sleep is critically reviewed by Freeman with respect to drugs. Barbitals and alcohol decrease the percentage of rapid-eye-movement (REM) sleep, but they lose this effect on repeated use. King also reviews the pharmacology of REM sleep. Kissin & Begleiter conclude their four-volume treatise on the biology of alcoholism: the first covers biochemistry; the second physiology and behavior; the third, clinical pathology; and the fourth, social biology. De Feudis reviews the actions of lithium on cerebral carbohydrate metabolism: it increases

glycogen in brains. Bowden & Maddux discuss various aspects of methadone maintenance.

Diamond, Bates & Levine review the pharmacology of drugs used in treating migraine. Kosterlitz and Villareal edit 20 essays on the agonist and antagonist action of narcotic and analgesic drugs. Brogden, Speight & Avery offer a review of the pharmacology, therapeutic efficacy and dependence liability of pentazocine, a useful analgesic. Woodbury, Penry & Schmidt edit 59 essays on anti-epileptic drugs.

CARDIOVASCULAR, RESPIRATORY, BLOOD, AND RENAL

Beal reviews the pathophysiology and clinicopharmacological aspects of hematinics, especially iron, Vitamin B₁₂, and folic acid preparations. Edwards edits 12 reviews of drugs affecting kidney function and metabolism. Ehrlich & Stivala survey the chemistry and pharmacology of heparin. With 452 references, Fisher well reviews the pharmacology, biogenesis, and production control of erythropoietin. Horowitz analyses the mechanism of action and clinical use of nitroglycerin.

With 796 references, Kones offers a comprehensive survey of molecular and ionic factors of altered myocardial contractility. Digitaloids are specific inhibitors of sarcolemnae, while Na- and K-activated ATP are concerned with active pumping of these ions. Ngai edits a well documented symposium of eight reviews on the pharmacology of oxygen, with special references to anesthesia. Tong reviews the clinical pharmacology of aminophylline.

ALIMENTARY AND NUTRITIONAL

Fidanza reviews the physiological actions of pantothenic acid, while Perri does likewise for Vitamin B₁₂. Gershberg analyzes the drug treatment of obesity. The regulation of Vitamin D metabolism and function is reviewed by Omdahl & De Lucca. Rindi surveys the physiological actions of thiamin, while Wasserman & Taylor review the metabolic roles of Vitamins D, E, and K.

HORMONES

Prostaglandins are now making it in a big way. Bergström edits the 110 reviews of the Vienna conference on this family of lipid acids and their wide activity. Hinman reviews recent aspects of their biochemistry. Kumar & Solomon analyze their significance in cutaneous biology. Lee reviews the interrelations between renal prostaglandins and blood pressure regulation. The Alza conference on prostaglandins, with 22 reviews, was edited by Ramwell & Pharris. This emphasized their significance in cellular biology. Southern edited reviews on the clinical applications of prostaglandin pharmacology to human reproduction from menstrual regulation to pregnancy termination.

Beroza & Knipling, in reviewing sex-attractant pheromones, conclude that they can be used to trap, or to prevent male gypsy moths from finding mates, and thus aid in control. Feldman, Funder & Edelman review subcellular mechanisms in the

action of adrenal steroids. The influence of ergot alkaloids on pituitary prolactin is reviewed by Floss, Cassidy & Robben. The clinical pharmacology of gastroenteric hormones is reviewed by Grossman. The mechanisms of action of female sex hormones are summarized by Jensen & DeSombre. Shafrir edits the Jerusalem Symposium on the 50th anniversary of insulin. Sutherland's Nobel Lecture details, with 74 references, the mechanism of hormone action and the discovery of adenosine-3, 5-monophosphate.

TOXICITY

Baker edits important Berlin session on toxicological problems of drug combinations, including modification of absorption, distribution, and metabolism. With 241 references, Bischoff reviews biocompatibility and toxicology of organic polymers used as tissue adhesives, prostheses, artificial organs, food packaging, and cookware. All are carcinogenic in rodents. Slater proposes tissue injury by free-radicle lipid peroxidation, with the self-destructive role of microsomal electron transport chain. Teratogenic drug screening procedures are reviewed by Tuchmann-Duplessis.

Metals

Angle edits 12 reviews of poisoning with iron compounds, usually hepatotoxicity from overload. Dales summarizes the neurotoxicity of alkyl mercury compounds. Felton and associates edit UCLA conference on poisoning with lead, mercury, and their compounds. With 130 references, Haley reviews pediatric and adult lead poisoning. Oehme surveys the mechanisms of heavy metal toxicities. Okamoto & Gunther edit a symposium on organic selenium and tellurium compounds, with much on toxicity, metabolism, and carcinogenesis. The hazards of lithium therapy during pregnancy are emphasized by Schou and associates. Vallee & Ulmer review the biochemical effects of cadmium, lead, and mercury, and their compounds. The relation of metals, ligands, and cancer is reviewed by Williams.

Organic Compounds

Bedford & Robinson review the alkylating properties of organophosphates. Daly, Jerina & Witkop survey the metabolism, toxicity, and carcinogenicity of arene oxides. Fukuto analyzes the metabolic toxicity of some 13 carbamate insecticides. With 78 references, Habermann reviews the pharmacotoxicity of the peptides, phospholipases, and hyaluronidases of bee and wasp venoms. Mellitin has 26 amino acid hydrophobic units with hydrophilic side chains and a molecular weight of 2840. James reviews oxalate toxicosis. Kadis, Ciegler & Ajl edit 11 reviews of fungal toxins including coumarins and various phytopathogenic toxins. Kao well reviews tetradotoxin and saxitoxin, and their significance in excitation phenomena. Kryzhanovsky reviews the mechanism of action of tetanus toxin, with its effects on synaptic processes. Lehr describes sulfonamide vasculitis. Shinozuka and associates review acute liver cell injury from D-galactosamine. Oxygen toxicity is reviewed by Winter & Smith.

ODDS AND ENDINGS

Bektemirov & Bektemirova review artificial interferon inducers. Guth & Bobbin survey the effects of drugs on peripheral auditory processes. Johnne & Groger describe naturally occurring acridine derivatives. Pfeifer reviews new papaverine alkaloids. With 69 references, Plotnikoff gives a review of the performance of pemoline, which may be useful in brain dysfunction in hyperkinetic children. Shader edits 12 reviews of the psychiatric complications of common drugs from digitalis to placebos. Speight & Avery review the pharmacology of "pizotifen" and its efficacy in treating vascular headaches. Weisburger, with 519 references, comprehensively reviews the pharmacology, toxicology, and pathological properties of hydroxylamines and hydroxamic acids, which play a role in immunological and allergic reactions and mutagenicity.

IN PROSPECT

Reviews of pharmacological information continue to increase in number and significance. Many, however, are buried in symposium or "recent advance" volumes. Publishers of such items would seem to have an obligation to assure that the contents of such review volumes would receive conventional indexing.

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