DRUGS AND THE PERFORMANCE HORSE

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By

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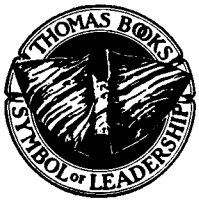

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To my wife, Marysia

BUCKINGHAM PALACE.

Anyone who has ever had anything to do with horses knows what a problem it is to keep them healthy and sound. If the horses are to be raced or used in competitive sport there is the added problem of training and preparing them to go faster or better than their rivals. The trouble is that the dividing line between treatment of injury and disease, on the one hand, and the preparation of horses for competition, on the other, is very narrow and not easily defined. In principle it is obviously right to use medications to cure injuries and disease; but it is patently wrong to use drugs to influence the performance of a horse.

If the equestrian sports are to be fair for all competitors, it is vitally important that these principles are expressed in clear, sensible and enforcible rules. This cannot be done without the help and co-operation of specialist and experienced veterinarians and pharmacologists.

The great value of this book is that for the first time the facts about contemporary medications, drugs and analytical techniques are set out in plain unmistakable language by an acknowledged world authority. It is a book that will be welcomed by competitors, trainers, coaches, veterinarians and administrators.

1980.

U.N.E.S.C.O.

INTERNATIONAL COUNCIL OF SPORT AND PHYSICAL EDUCATION
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THE FIRST RECORDED instance of doping is the biblical account of Adam and Eve eating the forbidden fruit; they did so not because they were hungry but because the serpent deceived them into believing that the fruit would render them God-like. Ever since, the belief that magic substances exist capable of imparting supernatural powers has been expressed in fairy tales and folklore: in stories like that of the sickly horse that turned into an enchanted steed after swallowing burning charcoal; of Popeye the sailor who develops miraculous powers after eating spinach; of the African witch doctor who gives his followers pieces of a lion's heart; and of the medieval alchemists' search for the "philosophers' stone" alluded to in Goethe's *Faust.*

Professor Tobin's book presents the available scientific evidence on "doping." It deals with a variety of pharmacological problems of interest to physiology and clinical medicine. Since Lexington, Kentucky, is a leading center of scientific research on horse racing and sports medicine, Professor Tobin's work has received worldwide attention. The Research Committee of the UNESCO International Council of Sport and Physical Education and the Doping Commission of the International Olympic Committee have sought his advice recently in connection with the establishment of the "Doping Control Laboratories" for the 1980 Olympic Games in Moscow.

Professor Tobin's volume includes information on three important questions: on the validity of the belief in the existence of substances capable of improving performances of horses and athletes; on the biochemical procedures for the detection of "dope" in urine; and on toxic effects of inappropriately large doses of "dope." We know most about the third, least about the first. It is quite possible that with the exception of anabolic hormones and of androgenic hormones in females, no substances exist that improve performances.

In 1964 the Research Committee of the UNESCO International Council of Sport and Physical Education held the first International Symposium of Doping in Gent, Belgium, under the Chairmanship of Nobel Laureate Professor Corneille Heymans. Its proceedings were published in 1965. Since then, no comprehensive study of the subject has appeared. Professor Tobin's book thus fills an urgent need.

ERNST JOKL

PREFACE

As I write these words, the field of performance horse medication in the United States is in turmoil. By the end of the 1970s, the days when horses ran on "hay, oats, and water" and little else were all but gone in the United States of America. Essentially alone among the major racing states, New York ran medication-free horses.* Most of the other major racing states, starting with Colorado and spreading from there, allowed some form of permitted or controlled medication in their horses. While as recently as 1968 the calling of a "positive" for the then-prohibited phenylbutazone on DANCER'S IMAGE in the Kentucky Derby triggered a court battle that lasted for years, by 1978 horses could legally run on phenylbutazone in many of the major racing states. More recently, however, federal legislation has been proposed to ban the use of medication in racing horses, and in the light of this proposal many racing jurisdictions are reassessing their medication policies.

Such quantum changes in usage patterns and people's attitudes to the use of drugs in horses has led to an increased demand for information about the effects of drugs in horses. This, in turn, has led to the setting up of research programs, such as the Kentucky Equine Drug Research Program, of which I am director. The mission of this program is to measure, analyze, and report on the detection and actions of drugs in horses. While results from this and other programs are published in scientific journals, these journals are usually not readily available to horsemen or interested members of the public, and neither is the raw data and partly digested information found in such journals particularly useful to horsemen. A further problem is that the average horseman has nowhere to go to get the background information required to understand such articles and put them in perspective. The primary objective of this book, therefore, is to bring together in one volume the necessary background material and published information to present horsemen with an understandable and informative account of the field of performance horse medication. This book is not an academic exercise, of which I have had plenty, but an effort to describe the current state of our knowledge about drugs in performance horses.

This book is likely to be useful to more than the average horseman. The science of pharmacology is of very recent origin, many of the drugs we use and most of the background information required to understand their use having been developed within the last twenty years. Since most people involved in the management of racing, including commission veterinarians, tend to have had little formal education within this period, this book should be particularly useful to them. The probability is that most commission veterinarians will, like myself, have had courses rather quaintly called "Materia Medica" which discussed the medications and carried the intellectual stamp on an earlier, less complex era.

* Medication "free" in that no drugs are permitted to be administered within 48 hours of post time.

Another important goal of this book is to strip away as much as possible of the myth, rumor, and ignorance that surrounds the use of drugs in horses. On the principle that the less people know, the more they suspect, I have chosen to name drugs and to discuss their actions, doses, time to peak effect, and clearance times in a way that some might interpret as aiding individuals who wish to misuse drugs. I do not think this is likely to be the case. As one reads this book it becomes apparent that most of the effective stimulant dopes have been with us for some time, in many cases up to 100 years and longer. Little that I can say about these drugs will help that most astute equine pharmacologist, the horseman knowledgeable in the use of drugs. The goal of this book is to put drugs in horses into accurate perspective. In the hands of the popular press, and more recently television, completely unsupported rumors have unquestionably done more damage to racing's image than all the drugs that have ever been given to horses. Journalism and media presentations that equate drugs like Lasix® (furosemide) and "bute" (phenylbutazone) with apomorphine and Sublimaze® and lump all drugs under the heading of "dope" will, it is hoped, be easier to refute if the actions, effects, and problems with drugs of all classes are clearly laid out. Secrecy and the uneasy feeling that racing has something to hide in its use of medication do more damage to racing's public image than anything else. Further, this book comes at a time when the racing industry, having developed analytical methods for reserpine and fentanyl, has made spectacular advances in its control of prohibited medication and has good reason to be proud of its record.

The medication of performance horses is a complex area, an interface between the fields of veterinary medicine, pharmacology, analytical chemistry, law, business, public relations, and horse breeding, to mention but a few. As an individual trained in the first three of these fields, I am competent to discuss the actions and detection of drugs in horses with some authority and to offer advice and opinions elsewhere. The reader should keep in mind that the further I stray from the first three of these fields, the less sure my grip on the subject is likely to be. As for my command of the first three fields, most of the material on which I base my comments is published and listed in the reference lists, so if the reader is so inclined he can check it out for himself.

In organizing this book, I have chosen to divide it into five sections. The first section deals principally with the background required to understand why people put drugs into horses, how drugs produce their effects in horses, and, in a broad sense, how horsemen control the use of drugs in horses. We then proceed to a discussion of the specific drugs, starting with the drugs of controlled medication (Section II), followed by the illegal drugs (Section III), and then the drugs that are not considered a regulatory problem (Section IV). Finally, then, in the last section (Section V) we deal with medication control from the point of view of the analyst, the regulator, and the lawyer.

Although equine medication is a complex area, the field does have its humorous aspects. In an attempt to capture this lighter side, my good friend Bob Herndon went through the text and sketched some of the incidents described. While many of these sketches carry very valid messages, their primary role is to lighten an often tedious field. None of them, therefore, is meant to be taken too seriously.

This book is, to my knowledge, the first attempt to draw together pertinent information from the various fields of equine medication and present an understandable synopsis. It is my hope that this volume will serve as an introduction to the area for the many people with an interest in drugs in horses but with little background in pharmacology. It should also serve as an up-to-date refresher for those whose formal training in this area may be dated. Finally, with a media battle looming over the possibility of federal legislation in this area, I hope that this book will serve as a stable point of reference in what can, unfortunately, be a highly emotional area. If I succeed in attaining any one of these goals, I will consider this book a success for the reader. As for myself, I have thoroughly enjoyed writing it.

THOMAS TOBIN

ACKNOWLEDGMENTS

While the writing of this book was largely the result of my own efforts, it would not have been possible without the support that I received from many individuals and organizations. First among these organizations must come the Kentucky State Racing Commission and the Kentucky Harness Racing Commission. In the early 1970s, these commissions, in cooperation with the Department of Veterinary Science, College of Agriculture, University of Kentucky, set up the Kentucky Equine Drug Research Program to study the actions and effects of drugs in racehorses. This program was taken from the talking stage to its present status by my Chairman, Doctor John T. Bryans of the Department of Veterinary Science, and he, along with Mr. Clarkson Beard and Mr. Carl Larsen of the Commissions, have nurtured its progress ever since. In addition, the guidance of Senior Steward Keene Daingerfield and the enthusiastic support and interest of Commissioner Anita Madden have been invaluable. Without their support and contributions to this research program, which is a formal expression of the commitment of Kentucky horsemen to the welfare of the horse, this book could not have been written.

Given the environment and wherewithal to do this work, one then needs colleagues to work with, consult with, and learn from. Foremost among my colleagues stands Professor Jerry Blake, who runs the Kentucky Equine Drug Testing Program. To him go my deepest thanks for his unfailing cooperation and support as we tackled the problems of our respective programs. Our success, such as it may be, is due in no small part to his abilities and endeavors. Others among my colleagues at the University of Kentucky who have contributed to this research include Harry Kostenbauder of the College of Pharmacy, John Dougherty of the Veteran's Administration, Wyman Dorough of the Graduate Program in Toxicology, and Ernst Jokl of the College of Human Medicine, all of whose varied contributions are deeply appreciated.

Equine medication control is an international concern. Among my other colleagues with whom I have consulted, cooperated, or argued, as the case may be, are Albert Gabel, Richard Ray and Richard Sams of the Ohio State University, George Maylin and Jack Henion of Cornell, and John McDonald of the Illinois Racing Board Laboratory. North of the border, Gerry Johnston of Montreal, and in Europe, Michael Moss and Douglas Witherington spring to mind. From all of these people and many others, I have learned much and always enjoyed their company.

Much of the original research on which this book is based was carried out by my students, to whom I will always be indebted. To take them in the order in which they joined my lab, they included Brian Roberts and Richard Miller, Connie White, Joan Combie and Eugenie Greene, Ted Shults and Steve Ballard, and Sylvia Chay. At times as important, and almost always carrying a heavy work load,

have been my student assistants, including Steve Arnett, Edith Nugent, Sandy Kownacki, Tommy Nugent, and Mark Crisman. For excellent technical assistance and providing the day-to-day backbone of my laboratory, I have to thank Lee Sturma, Roger Valentine, and William Edward Woods. All of these people made their own unique contributions to this program and thus to the completion of this book.

If you must write a book, a university is a good place to do it. Essential support services, such as artwork, photography, and secretarial work, can be begged, borrowed, bootlegged, or just plain stolen on campus more readily than perhaps anywhere else. Further, since the quality of my artwork and handwriting can only be described as dismal, these people had a further load to bear. To Gene Courtney and Bob Herndon, who did the graphs and cartoons, and to Diane Haughey and Virginia Ransdell, who did most of the typing, go my gratitude for taking this project from my pictographs to the finished product.

Finally, the last proofreading of this manuscript was completed in Nine Mile House, County Tipperary, under the eagle eye of my father, Nicholas Tobin. From Tipperary it went to my publisher, Payne Thomas of Charles C Thomas, Publisher, with whom it has been a pleasure to work.

CONTENTS

DRUGS AND THE PERFORMANCE HORSE

Section I

THE HISTORY AND PRINCIPLES OF MEDICATION IN PERFORMANCE HORSES

As this book developed, it became clear that it divided into five major sections. This first section, of five chapters, consists principally of the background material necessary to understand the subject of performance horse medication. In the first chapter of this section, we present an overview of the field to orient the reader to its broad general outlines. Having done this, we can then start to trace the history of the field from Roman to recent times.

In tracing the history of this field, I have taken the stories, rumors, anecdotes, and so forth as I found them. The fact that I recount these stories is not meant to authenticate them or the pseudopharmacology in them in any way, but merely to present some of the richly human texture of this subject. If any lesson should come from this section, it is probably that the urge to medicate for advantage is strongly woven into human nature, and as such will inevitably always be with us.

Given that the urge to medicate is likely to be with us indefinitely, the third chapter sketches the cast of characters involved in current medication control. This chapter therefore presents the societal framework within which the use of drugs in performance horses is regulated.

Finally, then, we are ready to look at the drugs themselves. Rather surprisingly, most drugs are natural products, or are derived from natural products, and in fact probably existed on this planet long before we did. As such, horses are well adapted to their use, and they absorb, metabolize, and eliminate these agents readily. Along the way, however, the drugs in which we are interested produce very specific effects in the horse, and the remainder of the book is devoted to consideration of these specific effects.

Chapter 1

THE MEDICATION OF PERFORMANCE HORSES: AN OVERVIEW

THE WORD "DOPING" first appeared in an English dictionary about 1899, defined as a mixture of opium and narcotics used for horses. The root of this word does not stem from English but apparently from the Dutch language, where the word "doop" means to dip. It was incorporated from the Dutch into a dialect spoken by the native workers in southeastern Africa, where the word "dop" meant the local schnapps or hard liquor that was used by them as a stimulant at worship. The word is still in use in that part of the world today, where it refers to the wine ration issued to native workers in South Africa by their overseers. According to Crosier, the word also made its way into American slang, where it was used to describe a gypsy habit of using tobacco adulterated with the seeds of *Datura stramonium* to stupefy wayfarers before robbing them. As modern "doping" is apparently an American habit, it became associated with the illicit medication of racing animals. In everyday English the word "dope" has many meanings, mostly connected with its early associations with drugging. Its basic meaning in the horse world concerns any drug used to affect the performance or demeanor of a horse, but most especially with reference to stimulant effects in the horse.

Two other slang words are also widely used to describe the doping of racehorses. In the United States, a stimulatory doping is often referred to as "hopping," with the obvious meaning that the horse will be visibly stimulated by the drug. This word is also found in the drug subculture, where a drug addict is known as a "hophead." In Great Britain the word "nobbling" is used to describe either depressant doping or laming of a horse, and a horse so treated is spoken of as having been "nobbled."

These terms, and most particularly the term "doping," carry sinister connotations of narcotic administration, addiction, insensibility to normal stimuli, and the stimulation of exceptional or unpredictable performances. In his first description of what he took to be "doped" horses racing in England in about the year 1900, the Honorable George Lambton described "horses who were notorious rogues running, and winning as if they were possessed by the devil, with their eyes staring out of their heads and sweat pouring off them" and one horse, "after winning a race dashed madly into a stone wall and killed itself." Because the general public draws no clear distinction between this very disturbing picture of stimulant doping and the beneficial effects of the legitimate medications approved in some states, American racing authorities prefer to avoid the word "dope" as a loaded and misused term. Thus, in North America "doping" is "illegal medication," in contrast with legal or controlled medication, or permitted medication, which encompasses legitimate therapeutic agents whose use on or close to race day may be approved. On the other hand, the racing authorities in Britain, where no medica-