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Preface

IN 1973, JUST as I began my medical practice in laboratory medicine, a resident called me to say that his wife had just delivered a baby. I congratulated him, but his response was immediate and unhappy: "Not so fast! Tell me if two people who are blood type O can have a type A baby." I mumbled something about the Bombay blood group, but we both knew the truth. Subsequently, I was asked to serve as an expert witness in a paternity case. I prepared to discuss the evidence of non-paternity in the ABO, RH, and MNSs blood groups. But instead, as the court session opened, the judge counseled the couple. The law in Maryland followed Lord Mansfield's Rule: If the couple chose to reconcile and did not divorce, the husband would be declared the child's legal father! As a result, I did not testify that day. The field of relationship testing (RT) is often full of surprises.

Expertise of RT lab directors and technical staff has shifted from serology and biochemistry to molecular biology over the past 50 years. Automation now provides rapid and accurate molecular test results for alleged paternity and other relationships. Unfortunately, many RT lab directors who understand biological and analytical principles have forgotten RT test logic because now we depend on data processors to generate the probabilities.

I first noticed the problem in my reviews of documents from labs recently applying for AABB accreditation in RT. Subsequently, I learned from a certified genetics counselor, new to the RT field, that there were no current and inexpensive reference sources that explained RT logic. I realized that forensic and RT lab staff, genetics counselors, attorneys, judges, and others could benefit from an

introductory source of RT information. I decided to write this little monograph to present RT fundamentals as a primer for them, but also as a review for others.

Chapter 1 reviews simple genetics, molecular chemistry, and reproductive biology upon which RT depends. Chapter 2 defines relevant RT statistics and how they are used to determine the strength of evidence favoring or rejecting a hypothesis. Chapter 3 presents a historical perspective of RT—the why and how its logic evolved. Chapter 4 deals specifically with common parentage tests and Chapter 5 specifically describes testing of full- and half-siblings.

Further information may be obtained from the most recent edition of the AABB *Standards for Relationship Testing Laboratories*. Particularly useful is the Portal version of the Standards, which also provides guidance, citations to relevant literature, and information on approved variances to accreditation requirements

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