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nur Spiel und Betrug trieben, unzulässig öffentlicher Aemter fähig gehalten werden, wär' es auch aus keinem andern Grund, als weil zu präsumiren ist, daß demjenigen, der an nichts Unsichtbares glaubt, der mit dem Heiligsten nur Betrug vorhat, auch keine Eide noch andere, zuletzt nur auf unsichtbaren Gründen beruhende, Verpflichtungen heilig seyn werden. Wer einem Philosophen, der nicht ohne Wirkung auf sein Zeitalter geblieben, vorwirft, er suche mit den Worten Gott, moralische Freiheit, Gut und Böses nur irre zu führen, zu täuschen, absichtlich zu hintergehen, der sagt von ihm, daß er heimlich die Grundlagen der menschlichen Gesellschaft untergrabe, hinterlistig die Bande aufzulösen suche, auf deren Erhaltung das wahre, innere und äußere Wohl des einzelnen Menschen und ganzer Völker beruht; der sucht den (leider! nicht ohne Ursache) schon verhaßten Namen des Philosophen in ihm zum Gegenstande des öffentlichen Abscheus zu machen.

Hier hat die öffentliche Meinung ein Recht, die offenste unumwundenste Erklärung zu fordern, damit nicht entweder ein Unwürdiger das Vertrauen, welches ihm der Charakter eines wissenschaftlichen Mannes erwirbt, mißbrauche, oder der andere, welcher das Mittel einer so frevelhaften Verleumdung angewendet, durch die öffentliche Impunität ein einladendes Beispiel zu ähnlichem Frevel für andere werde, und auf solche Art öffentliche Skandale, anstatt verhindert und gemindert, vielmehr befördert und vermehrt werden.

Hieraus mag das Publikum den Ernst begreifen, mit welchem ich die von Hrn. Jacobi gegen mich vorgebrachten Beschuldigungen aufzunehmen nöthig fand, da mancher vielleicht der Meinung seyn könnte, sie hätten höchstens verdient, lächerlich gemacht, oder vielmehr von der Seite ihrer wirklichen Lächerlichkeit dargestellt, nicht aber widerlegt zu werden.

Nachdem ich indeß, zumal durch den letzten, wissenschaftlichen Abschnitt, alle Gerechtigkeit erfüllt hatte, fühlte ich doch lebhaft das Bedürfniß, ein Ganzes aufzustellen, wofür ich das Bisherige mit gutem Gewissen nicht gelten lassen konnte.

„Das also, sagte ich zu mir selbst, wären die Gründe, durch welche Hr. Jacobi alle wissenschaftliche Philosophie bestreitet — sie gern eines

nothwendigen Atheismus überführen möchte; die Gründe, auf welche er sich bisher so viel zu gut gethan. Ich kann nur bedauern, daß sie nicht besser sind; auch thätigere hätte ich aufzulösen verstanden. Eine so flache, höchst allgemeine Wissenschaft philosophischer Grundsätze, ja der ersten Regeln, der wesentlichsten Bestimmungen des gesetzlichen Denkens, gibt ihm den Muth zum Angriff auf ein durchdachtes Ganze der Wissenschaft. Mit solcher Unkenntniß der Grundgelente meines Systems meint er blindlings ihm die Sehnen zu lähmen. — Wie wenig ist aber mit alldem der vielseitige Mann umfaßt! Offenbar macht das Wissenschaftliche nur den geringsten Theil von ihm aus, den bei weitem bedeutendsten aber die Kunst, mit welcher er, gleich einem gewandten Manne, der durch wenig es viel auszurichten versteht, mit geringen und fast nicht der Rede werthen Begriffen sich eine solche Breite gegen die Welt zu geben weiß, indem er sie nach verschiedenen, ja nach allen Seiten hinwendet“.

Unter diesen Ueberlegungen kam es mir vor, als ließe sich jene Vielseitigkeit nicht besser umfassen, als wenn sie in Handlung, Hr. Jacobi also in thätiger Hinwendung nach allen jenen Seiten betrachtet, und dann zugleich beobachtet würde, wie er von einer jeden zurückkäme.

Diese Vorstellung beschäftigte mich bald so lebhaft, daß sie in wenigen Augenblicken sich vor mir in allen ihren Theilen ausgebildet hatte, und endlich in eine wirkliche Vision überging, mit deren Erzählung ich hoffen kann, dieser Schrift erst die gehörige Vollenbung zu geben.

Ich sah eine unermessliche Menge von Menschen von allen Arten, Geschlechtern, Altern und Beschäftigungen vor mir, worin ich nicht umhin konnte, nach einigem Bedenken das liebe sogenannte Publikum, oder auch das vielbesprochene Zeitalter zu erkennen. Hr. Jacobi stand dieser Menge als Redner gegenüber; ich konnte wohl sehen, wie er mit vieler Aktion sprach, aber der großen Entfernung wegen nichts hören. Indeß wie er redete, gleich als wären seine Worte lauer Regen, schmolz die Menge nicht anders als Schnee hinweg, ein Theil verlief sich dahin, der andere dorthin, nur noch ein kleiner Kernhaufen widerstand, der

schlechterdings nicht wegzubringen schien. Hiedurch erhielt auch ich Raum näher zu treten, und bemerkte nun, daß ihn einer von den übrig Gebliebenen bereits zu antworten angefangen hatte, wovon ich nur noch Folgendes vernahm.

„Da Sie die schwächste Note des Theismus angeben, unter welcher nicht leicht noch einige Religion stattfinden kann, so ist das praktische Postulat Ihrer Schriftstellerei die allgemeine Gottesleugnung. Aber unmöglich können Sie doch die ganze Zeit zur gottesleugnerischen herunter demonstrieren<sup>1</sup>, besonders da sich weit kräftigere Regungen lebendiger Religion, ja sogar Vorzeichen eines nicht allegorischen, sondern ernstlich gemeinten Christenthums von solchen Seiten hervorthun, von welchen Sie es am wenigsten erwartet haben.

„Sie der Retter des Theismus? — Gestehen wir, Sie benehmen sich dabei auf eine sonderbare Art. Ohngefähr wie der Befehlshaber einer festen Stadt, der dem davor liegenden Feinde nicht nur das Geschütz sammt Pulver und Kugeln, sondern sogar den Mundvorrath der Besatzung hinauswürfte, bloß in der Absicht, sein Herz zu zeigen, und in der Gewißheit, daß er verhungere, und also die Festung doch eigentlich

<sup>1</sup> Man hat in öffentlichen Blättern dieses Jahrs ein Gelegenheits-Carmen zu Ehren des Hrn. Jacobi gelesen, worin dieser unter andern auf folgende Art verherrlicht wird:

„Gottes-Lehrer (i. Leerer) bist du unsrer Gott leugnenden Zeit“

Fast so rührend, wie das bekannte (von Hrn. Jacobi selbst erwähnte) Sinn- gebicht Nicolais:

„Es ist ein Gott, das sagte Moses schon,  
Doch den Beweis gab Moses Mendelssohn.“

Obgleich eine gewisse Lahnheit im Ganzen, besonders der Jacobisch (man s. tiefer unten) verkürzte Gott auf einen etwas ärmlichen Dichter schließen läßt, so ist doch bekannt, daß solche Clienten immer am besten wissen, wodurch ihr Principal am meisten geschmeichelt wird. Daher es wohl kaum ungerecht wäre, anzunehmen, daß jener Vers nur die eigne geheime Meinung des Verherrlichten von seinem Beruf enthalte, wenn auch nicht seine ganze Schriftstellerei den vollgültigsten Beweis des wirklichen Vorhandenseyns dieser Meinung abgäbe.

nicht ihm genommen werden könne. Anstatt den Verstand durch noch kräftigeren Verstand zu bekämpfen, wollen Sie ihm lieber gar absterben, als könnte Ihnen der Verstand auch nicht mehr bei, oder als verlören ihn alle anderen, wenn Sie des Ihrigen sich begäben. Es ist das alte Stratagem des Vogels Strauß, der seinen Kopf in den Sand steckend meint, dem Verfolger ebenso unsichtbar geworden zu seyn wie dieser ihm.

„Das wäre ächter Theismus, der behauptet, nicht nur, daß es keine wissenschaftliche Erkenntniß Gottes gibt, sondern, daß wir die Natur eines solchen persönlichen Wesens nach unserer Vorstellungsart unmöglich finden müssen? — Das wäre Theismus, das Meisterwerk der Schöpfung, das Ebenbild Gottes, „den Er sich selbst zu schaffen vorbehielt, dem Er Seinen Geist einhauchte“, für so dumm zu halten, daß man sagen dürfte (S. 168), unmöglich sey ihm darzuthun, daß die Natur — die Ihrige versteht sich, diese unter unsere Füße erniedrigte — nicht Gott, nicht Schöpfer, daß sie nur Werk und Geschöpf sey, unmöglich also sey ihm den plumpesten Fetischismus roher Wilder mit dem Verstande zu widerlegen?

„O! daß er käme, der uns den ächten Theismus lehrte, die Höhen und Tiefen dieses wundervollen Systems uns eröffnete! Er würde ein empfängliches Geschlecht finden, nachdem wir zwar den einfältigen Glauben unserer Väter nicht wiedergewonnen, aber doch die leeren Begriffe eines sogenannt-philosophischen Glaubens und Unglaubens, mit denen wir uns so lange gebrüstet, schmerzlich belehrt von ihrer Unzulänglichkeit, rein in uns ausgerottet haben. Könnten Sie den wahren Theismus lehren, die Zeit würde Sie auf den Händen tragen, und Sie brauchten nicht schon auf dem Titel Ihrer Bücher zu klagen: „Es gibt unempfindliche Zeiten“. Unempfindlich ist freilich auch die gegenwärtige, aber auf zweierlei Art, für einiges, weil es über, für anderes, weil es wirklich unter ihr ist.

„Lassen Sie sehen, was der Hauptinhalt des theistischen Glaubens ist, und lassen Sie uns damit Ihre Reden vergleichen.

<sup>1</sup> Jacobis David Hume, oder über Idealismus und Realismus, S. 189.

„Der erste Artikel dieses Glaubens war von Anbeginn bis jetzt, daß Gott diese gegenwärtige Welt freiwillig erschaffen, daß sie also nicht von Ewigkeit her existire, sondern ihrer Natur nach anfänglich und endlich — somit überhaupt die Zeit dieser Welt eine bestimmte Zeit sey.

„Sie dagegen lehren: „daß Gott nothwendig, von Ewigkeit her erschaffen habe, wird auch von dem tiefer denkenden Theisten nicht gelengnet“. (S. 174). Hätten Sie nur dieß Eine Wort nicht gesagt! Dieß Eine zeigt, daß Sie für die eigentlichen Tiefen, für die höchste Paradoxie dieses Systems, welche, überwunden, sich in die klärtesten und zugleich einfachsten Gedanken auflöst, keinen Sinn — daß Sie, trotz der beständigen Versicherungen, der Verstand sey antitheistisch, für die Behauptung dessen, was eigentlich in diesem System den Verstand anzustoßen scheint, aber gerade deshalb die höchste Kraft des Verstandes erfordert, — selber keinen Muth haben, indem Sie ihm leichtherzig ausweichen. Wenn Sie einmal über diesen Punkt hinweg sind, was hat dann noch der Theismus Unbegreifliches, oder jene ewige Zeit, die Ihr Haupt-, ja Ihr einziger theoretiſcher Einwurf gegen den Pantheismus ist<sup>1</sup>, Anstößiges?

„Ein zweiter Hauptartikel des theistischen Glaubens ist, daß wir, vermöge unseres freien Willens, auch in einem freien und unmittelbaren Bezug zu Gott stehen, daß dieser Wille eine von jenem persönlichen Wesen als solchem unabhängige Wurzel hat, kraft deren er zu beidem fähig ist, sich in Liebe ihm zu-, oder in Verschlossenheit von ihm abzuwenden. Sie aber erklären, die Freiheit des menschlichen Willens bestehe bloß in einer unbegreiflichen Kraft zum Guten, nimmer aber in der, wie Sie meinen, unseligen Fähigkeit, das Böse wie das Gute zu wollen. Der Mensch, setzen Sie hinzu, sey vielmehr bloß, inwiefern diese unselige Fähigkeit ihm bewohne, nicht frei (S. 97). Was heißt dieß anders, als das Wort Freiheit beibehalten, die Kraft derselben aber, den eigentlichen

<sup>1</sup> Wie nämlich Jacobi diesen versteht, als hätte aus der Thatsache, daß die Dinge sich bewegten und veränderten, Spinoza geschlossen, sie müßten sich von Ewigkeit her bewegt und verändert haben. (Zus. im Handexemplar). — Briefe über Spinoza S. 410, vergl. Vorrede zu eben demselben Buch S. XX.

Willen, den Menschen entziehen? <sup>1</sup> Und dabei erlauben Sie sich die unverantwortliche Zweideutigkeit, zu sagen: „dieses Vermögen, seine sinnlichen Neigungen nach den Forderungen der Tugend zu bestimmen, sey von jeher die moralische Freiheit genannt worden (ebend.), welches entweder eine unbegreifliche historische Verblendung oder ein offenbar betrüglisches Vorgeben ist, um so irreführender, als das Falsche davon auf dem bloßen Wörtchen die beruht. Das natürliche Gefühl, gleichwie der Verstand, sagt uns, daß, wenn es zu dem, was böse genannt wird, keinen freien Willen gibt, auch das Böse unmöglich ein wahrhaftes Böses seyn kann; Sie aber wollen das Wort nicht haben, und ziehen sich, um aller weiteren Nachfrage wegen dieses — wahrlich nicht bloß materiellen, sondern formellen Widerspruchs zu entgehen, in Ihr gewöhnliches geheimnißvolles Dunkel zurück. Wollten Sie jedoch einmal über diese Abgründe der Wissenschaft auf der leicht geschlagenen Brücke Ihrer Unwissenheit hinwegschreiten, warum gestanden Sie nicht lieber gleich, Sie begreifen gar nichts von der Sache, als daß Sie uns jetzt unter dem Schein, eine moralische Freiheit zu behaupten, sogar den Begriff derselben hinwegzunehmen suchen?

„Ein dritter wesentlicher Artikel dieses Glaubens ist der Gedanke einer künftigen näheren Vereinigung mit dem Gott, den wir hier nicht sehen, dem persönlichen, und einer gleichmöglichen weiteren Entfernung von ihm — der Gedanke einer Scheidung der Guten und Bösen, welcher ohne eine eigentliche Geisterwelt schlechterdings undenkbar ist. Sie

<sup>1</sup> Friedrich Schlegel in der Recension des Baldemar drückt sich hierüber so aus: „Da er (Jacobi) trotz der schönen Lobreden auf die angebliche Freiheit, den Willen leugnet; indem er ihn theils mit dem vernünftigen Instinkt für identisch (Br. über Spin. S. XXIX. XXXVIII. Allw. S. XVIII. Anr.), theils für einen „Ausbruch des göttlichen Willens“, für einen „Funken aus dem ewigen, reinen Lichte“, für eine „Kraft der Allmacht,“ für einen Ausbruch des göttlichen Herzens in dem Innersten unseres Herzens (Spin. S. XIV. S. 253. Allw. S. 300) erklärt: so kann seine Sittlichkeit nur Liebe oder Gnade seyn; auch scheint er von keiner Tugend zu wissen, welche Gesetze ehrte, und sich in Thaten bewiese“. Man s. Charakteristiken und Kritiken von A. W. Schlegel und Friedrich Schlegel. Erster Band S. 40. 41.



LETTER IV  
ON THE QUAKERS

ABOUT this time arose the illustrious William Penn, who established the power of the Quakers in America, and would have made them appear venerable in the eyes of the Europeans, were it possible for mankind to respect virtue when revealed in a ridiculous light. He was the only son of Vice-Admiral Penn, favourite of the Duke of York, afterwards King James II.

William Penn, at twenty years of age, happening to meet with a Quaker<sup>2</sup> in Cork, whom he had known at Oxford, this man made a proselyte of him; and William being a sprightly youth, and naturally eloquent, having a winning aspect, and a very engaging carriage, he soon gained over some of his intimates. He carried matters so far, that he formed by insensible degrees a society of young Quakers, who met at his house; so that he was at the head of a sect when a little above twenty.

Being returned, after his leaving Cork, to the Vice-Admiral his father, instead of falling upon his knees to ask his blessing, he went up to him with his hat on, and said, "Friend, I am very glad to see thee in good health." The Vice-Admiral imagined his son to be crazy, but soon finding he was turned Quaker, he employed all the methods that prudence could suggest to engage him to behave and act like other people. The youth made no other answer to his father, than by exhorting him to turn Quaker also. At last his father confined himself to this single request, viz., "that he should wait upon the King and the Duke of York with his hat under his arm, and should not 'thee' and 'thou' them." William answered, "that he could not do these things, for conscience' sake," which exasperated his father to such a degree, that he turned him out of doors. Young Penn gave God thanks for permitting him to suffer so early in His cause, after which he went into the city, where he held forth, and made a great number of converts.

The Church of England clergy found their congregations

<sup>2</sup> Thomas Loe.

dwindle away daily; and Penn being young, handsome, and of a graceful stature, the court as well as the city ladies flocked very devoutly to his meeting. The patriarch, George Fox, hearing of his great reputation, came to London (though the journey was very long) purely to see and converse with him. Both resolved to go upon missions into foreign countries, and accordingly they embarked for Holland, after having left labourers sufficient to take care of the London vineyard.

Their labours were crowned with success in Amsterdam, but a circumstance which reflected the greatest honour on them, and at the same time put their humility to the greatest trial, was the reception they met with from Elizabeth, the Princess Palatine, aunt to George I. of Great Britain, a lady conspicuous for her genius and knowledge, and to whom Descartes had dedicated his *Philosophical Romance*.

She was then retired to The Hague, where she received these Friends, for so the Quakers were at that time called in Holland. This princess had several conferences with them in her palace, and she at last entertained so favourable an opinion of Quakerism, that they confessed she was not far from the kingdom of heaven. The Friends sowed likewise the good seed in Germany, but reaped very little fruit; for the mode of "theeing" and "thouing" was not approved of in a country where a man is perpetually obliged to employ the titles of "highness" and "excellency." William Penn returned soon to England upon hearing of his father's sickness, in order to see him before he died. The Vice-Admiral was reconciled to his son, and though of a different persuasion, embraced him tenderly. William made a fruitless exhortation to his father not to receive the sacrament, but to die a Quaker, and the good old man entreated his son William to wear buttons on his sleeves, and a crape hatband in his beaver, but all to no purpose.

William Penn inherited very large possessions, part of which consisted in Crown debts due to the Vice-Admiral for sums he had advanced for the sea service. No moneys were at that time more insecure than those owing from the king. Penn was obliged to go more than once, and "thee" and "thou" King Charles and his Ministers, in order to

recover the debt; and at last, instead of specie, the Government invested him with the right and sovereignty of a province of America, to the south of Maryland. Thus was a Quaker raised to sovereign power. Penn set sail for his new dominions with two ships freighted with Quakers, who followed his fortune. The country was then called Pennsylvania from William Penn, who there founded Philadelphia, now the most flourishing city in that country. The first step he took was to enter into an alliance with his American neighbours, and this is the only treaty between those people and the Christians that was not ratified by an oath, and was never infringed. The new sovereign was at the same time the legislator of Pennsylvania, and enacted very wise and prudent laws, none of which have ever been changed since his time. The first is, to injure no person upon a religious account, and to consider as brethren all those who believe in one God.

He had no sooner settled his government, but several American merchants came and peopled this colony. The natives of the country, instead of flying into the woods, cultivated by insensible degrees a friendship with the peaceable Quakers. They loved these foreigners as much as they detested the other Christians who had conquered and laid waste America. In a little time a great number of these savages (falsely so called), charmed with the mild and gentle disposition of their neighbours, came in crowds to William Penn, and besought him to admit them into the number of his vassals. It was very rare and uncommon for a sovereign to be "thee'd" and "thou'd" by the meanest of his subjects, who never took their hats off when they came into his presence; and as singular for a Government to be without one priest in it, and for a people to be without arms, either offensive or defensive; for a body of citizens to be absolutely undistinguished but by the public employments, and for neighbours not to entertain the least jealousy one against the other.

William Penn might glory in having brought down upon earth the so much boasted golden age, which in all probability never existed but in Pennsylvania. He returned to England to settle some affairs relating to his new dominions.

After the death of King Charles II., King James, who had loved the father, indulged the same affection to the son, and no longer considered him as an obscure sectary, but as a very great man. The king's politics on this occasion agreed with his inclinations. He was desirous of pleasing the Quakers by annulling the laws made against Nonconformists, in order to have an opportunity, by this universal toleration, of establishing the Romish religion. All the sectarists in England saw the snare that was laid for them, but did not give into it; they never failing to unite when the Romish religion, their common enemy, is to be opposed. But Penn did not think himself bound in any manner to renounce his principles, merely to favour Protestants to whom he was odious, in opposition to a king who loved him. He had established a universal toleration with regard to conscience in America, and would not have it thought that he intended to destroy it in Europe, for which reason he adhered so inviolably to King James, that a report prevailed universally of his being a Jesuit. This calumny affected him very strongly, and he was obliged to justify himself in print. However, the unfortunate King James II., in whom, as in most princes of the Stuart family, grandeur and weakness were equally blended, and who, like them, as much overdid some things as he was short in others, lost his kingdom in a manner that is hardly to be accounted for.

All the English sectarists accepted from William III. and his Parliament the toleration and indulgence which they had refused when offered by King James. It was then the Quakers began to enjoy, by virtue of the laws, the several privileges they possess at this time. Penn having at last seen Quakerism firmly established in his native country, went back to Pennsylvania. His own people and the Americans received him with tears of joy, as though he had been a father who was returned to visit his children. All the laws had been religiously observed in his absence, a circumstance in which no legislator had ever been happy but himself. After having resided some years in Pennsylvania he left it, but with great reluctance, in order to return to England, there to solicit some matters in favour of the

commerce of Pennsylvania. But he never saw it again, he dying in Ruscombe, in Berkshire, in 1718.

I am not able to guess what fate Quakerism may have in America, but I perceive it dwindles away daily in England. In all countries where liberty of conscience is allowed, the established religion will at last swallow up all the rest. Quakers are disqualified from being members of Parliament; nor can they enjoy any post or preferment, because an oath must always be taken on these occasions, and they never swear. They are therefore reduced to the necessity of subsisting upon traffic. Their children, whom the industry of their parents has enriched, are desirous of enjoying honours, of wearing buttons and ruffles; and quite ashamed of being called Quakers they become converts to the Church of England, merely to be in the fashion.

## LETTER V

## ON THE CHURCH OF ENGLAND

ENGLAND is properly the country of sectarists. *Multe sunt mansiones in domo patris mei* (in my Father's house are many mansions). An Englishman, as one to whom liberty is natural, may go to heaven his own way.

Nevertheless, though every one is permitted to serve God in whatever mode or fashion he thinks proper, yet their true religion, that in which a man makes his fortune, is the sect of Episcopalians or Churchmen, called the Church of England, or simply the Church, by way of eminence. No person can possess an employment either in England or Ireland unless he be ranked among the faithful, that is, professes himself a member of the Church of England. This reason (which carries mathematical evidence with it) has converted such numbers of Dissenters of all persuasions, that not a twentieth part of the nation is out of the pale of the Established Church. The English clergy have retained a great number of the Romish ceremonies, and especially that of receiving, with a most scrupulous attention, their tithes. They also have the pious ambition to aim at superiority.

Moreover, they inspire very religiously their flock with a



holy zeal against Dissenters of all denominations. This zeal was pretty violent under the Tories in the four last years of Queen Anne; but was productive of no greater mischief than the breaking the windows of some meeting-houses and the demolishing of a few of them. For religious rage ceased in England with the civil wars, and was no more under Queen Anne than the hollow noise of a sea whose billows still heaved, though so long after the storm when the Whigs and Tories laid waste their native country, in the same manner as the Guelphs and Ghibellines formerly did theirs. It was absolutely necessary for both parties to call in religion on this occasion; the Tories declared for Episcopacy, and the Whigs, as some imagined, were for abolishing it; however, after these had got the upper hand, they contented themselves with only abridging it.

At the time when the Earl of Oxford and the Lord Bolingbroke used to drink healths to the Tories, the Church of England considered those noblemen as the defenders of its holy privileges. The lower House of Convocation (a kind of House of Commons) composed wholly of the clergy, was in some credit at that time; at least the members of it had the liberty to meet, to dispute on ecclesiastical matters, to sentence impious books from time to time to the flames, that is, books written against themselves. The Ministry which is now composed of Whigs does not so much as allow those gentlemen to assemble, so that they are at this time reduced (in the obscurity of their respective parishes) to the melancholy occupation of praying for the prosperity of the Government whose tranquillity they would willingly disturb. With regard to the bishops, who are twenty-six in all, they still have seats in the House of Lords in spite of the Whigs, because the ancient abuse of considering them as barons subsists to this day. There is a clause, however, in the oath which the Government requires from these gentlemen, that puts their Christian patience to a very great trial, viz., that they shall be of the Church of England as by law established. There are few bishops, deans, or other dignitaries, but imagine they are so *jure divino*; it is consequently a great mortification to them to be obliged to confess that they owe their dignity to a pitiful law enacted by

# HIROSHIMA

*The following note  
appeared in the NEW YORKER of 31 August, 1946,  
as an introduction to John Hersey's article*

The NEW YORKER this week devotes its entire editorial space to an article on the almost complete obliteration of a city by one atomic bomb, and what happened to the people of that city. It does so in the conviction that few of us have yet comprehended the all but incredible destructive power of this weapon, and that everyone might well take time to consider the terrible implications of its use.





# I

## A NOISELESS FLASH

AT exactly fifteen minutes past eight in the morning, on August 6th, 1945, Japanese time, at the moment when the atomic bomb flashed above Hiroshima, Miss Toshiko Sasaki, a clerk in the personnel department at the East Asia Tin Works, had just sat down at her place in the plant office and was turning her head to speak to the girl at the next desk. At that same moment, Dr. Masakazu Fujii was settling down cross-legged to read the Osaka *Asahi* on the porch of his private hospital, overhanging one of the seven deltaic rivers which divide Hiroshima; Mrs. Hatsuyo Nakamura, a tailor's widow, stood by the window of her kitchen watching a neighbour tearing down his house because it lay in the path of an air-raid-defence fire lane; Father Wilhelm Kleinsorge, a German priest of the Society of Jesus, reclined in his underwear on a cot on the top floor of his order's three-storey mission house, reading a Jesuit magazine, *Stimmen der Zeit*; Dr. Terufumi Sasaki, a young member of the surgical staff of the city's large, modern Red Cross Hospital, walked along one of the hospital corridors with a blood specimen for a Wassermann test in his hand; and the Reverend Mr. Kiyoshi Tanimoto, pastor of the Hiroshima Methodist Church, paused at the door of a rich man's house in Koi, the city's western suburb, and prepared to unload a handcart full of things he had evacuated from town in fear of the massive B29 raid which everyone expected Hiroshima to suffer. A hundred thousand people were killed

by the atomic bomb, and these six were among the survivors. They still wonder why they lived when so many others died. Each of them counts many small items of chance or volition—a step taken in time, a decision to go indoors, catching one street-car instead of the next—that spared him. And now each knows that in the act of survival he lived a dozen lives and saw more death than he ever thought he would see. At the time none of them knew anything.

The Reverend Mr. Tanimoto got up at five o'clock that morning. He was alone in the parsonage, because for some time his wife had been commuting with their year-old baby to spend nights with a friend in Ushida, a suburb to the north. Of all the important cities of Japan, only two, Kyoto and Hiroshima, had not been visited in strength by *B-san*, or Mr. B, as the Japanese with a mixture of respect and unhappy familiarity, called the B-29; and Mr. Tanimoto, like all his neighbours and friends, was almost sick with anxiety. He had heard uncomfortably detailed accounts of mass raids on Kure, Iwakuni, Tokuyama, and other nearby towns; he was sure Hiroshima's turn would come soon. He had slept badly the night before, because there had been several air-raid warnings. Hiroshima had been getting such warnings almost every night for weeks, for at that time the B-29s were using Lake Biwa, north-east of Hiroshima, as a rendezvous point, and no matter what city the Americans planned to hit, the Super-fortresses streamed in over the coast near Hiroshima. The frequency of the warnings and the continued abstinence of Mr. B with respect to Hiroshima had made its citizens jittery; a rumour was going

central limit theorem is the mathematical reason why.

Okay, time to demonstrate the central limit theorem in action. I'm not going to give a mathematical proof, since very few people would want to read it. Instead, I'm going to do the same thing I've done throughout this chapter: I'll use R to simulate it. Let's suppose that the population distribution is rectangular (i.e., all values over a certain range are equally likely). Generating 100,000 samples from this distribution gives us the sampling distribution shown in Figure 10.4a for  $N = 1$ , where I've plotted the appropriate normal distribution over the top to give you a sense of what to compare it to. Clearly, this population isn't very close to normal at all. Next, let's see what happens then if we generate 100,000 samples of size  $N = 2$ , and then plot the histogram of the means of these samples? This time, we get the triangular distribution shown in Figure 10.4b. That's not normal either, but it's definitely closer. When, we increase the sample size to  $N = 3$ , the sampling distribution of the mean looks closer to normal, as illustrated in Figure 10.4c, and by the time we've raised our sample size to a massive  $N = 4$ , as shown in Figure 10.4, it's pretty hard to think that this is anything other than a normal distribution. In other words, while the central limit theorem *technically* refers only to things getting normal as  $N$  approaches infinity, in this example all it took was a sample size of 4. Which is a bit smaller than infinity, I must admit. The take home message is that everything turns into a normal distribution, eventually.<sup>5</sup>

## 10.5

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### Estimating a confidence interval

The last thing I'm going to talk about in this chapter are confidence intervals. The estimates that we talked about in the last section are all examples of "point" estimates. What I mean by that is that what we're doing is making a single "best guess" about what the value of a particular population parameter is. Most of the time, we don't just want a single best guess, we also want to be able to estimate a range of values, in such a way that we can feel pretty confident that the range includes the true value. The name for this is a **confidence interval**.

This is actually pretty easy, since all the hard work was done in the previous sections. To see how this works, let's suppose for the moment that we actually knew the true mean  $\mu$  and the true standard deviation  $\sigma$ . Then we would also be able to say that (as long as  $N$  is big enough) the sampling distribution for the mean  $\bar{X}$  of a sample drawn from this population would be normal with mean  $\mu$ . Not only that, we also know that the standard error of the mean is calculated by dividing the population standard deviation  $\sigma$  by the square root of the sample size  $\sqrt{N}$ . Now, remember from our previous discussion of the normal distribution in Section 9.4 that 95% of the distribution lies within 2 standard deviations of the mean? To be slightly more precise, we can use the `qnorm()` function to compute the 2.5th and 97.5th percentiles of the normal distribution

```
> qnorm( p = c(.025, .975) )  
[1] -1.959964  1.959964
```

and we see that in fact 95% of the distribution falls within 1.96 standard deviations either side of the mean. What does that tell us about  $\bar{X}$ ? Well, it tells us that 95% of all data sets (of size  $N$ ) that we could sample from this population will have a sample mean  $\bar{X}$  that falls within 1.96 standard errors of

---

<sup>5</sup>Well, sort of. The central limit theorem doesn't cover every possible situation, but it is very very broad. Like most introductory stats texts, I've discussed one situation where the central limit theorem holds: when you're taking an average across lots of independent events drawn from the same distribution. However, the central limit theorem is much broader than this. There's a whole class of things called "*U*-statistics" for instance, all of which satisfy the central limit theorem and therefore become normally distributed for large sample sizes. The mean is one such statistic, but it's not the only one.

the mean! In other words, there is a 95% probability that:

$$\mu - \left(1.96 \times \frac{\sigma}{\sqrt{N}}\right) \leq \bar{X} \leq \mu + \left(1.96 \times \frac{\sigma}{\sqrt{N}}\right)$$

Okay, that's all well and good, but in some ways it's the opposite of what we're interested in. The equation above tells us what we should expect about the sample mean, given that we know what the population parameters are. What we want is to have this work the other way around: we want to know what we should believe about the population parameters, given that we have observed a particular sample. However, it's not too difficult to do this. Using a little high school algebra, a sneaky way to rewrite our equation is like this:

$$\bar{X} - \left(1.96 \times \frac{\sigma}{\sqrt{N}}\right) \leq \mu \leq \bar{X} + \left(1.96 \times \frac{\sigma}{\sqrt{N}}\right)$$

What this is telling is is that the range of values has a 95% probability of containing the population mean  $\mu$ . We refer to this range as a **95% confidence interval**, denoted  $CI_{95}$ . In short, as long as  $N$  is sufficiently large – large enough for us to believe that the sampling distribution of the mean is normal – then we can write this as our formula for the confidence interval:

$$CI_{95} = \bar{X} \pm \left(1.96 \times \frac{\sigma}{\sqrt{N}}\right)$$

Of course, there's nothing terribly special about the value 1.96, other than the fact it's the number of standard deviations away from the mean that you need to extend your interval to cover 95% of the sampling distribution. If I'd wanted a 70% confidence interval, I could have used the `qnorm()` function to calculate the 15th and 85th quantiles:

```
> qnorm( p = c(.15, .85) )
[1] -1.036433  1.036433
```

and so the formula for  $CI_{70}$  would be the same as the formula for  $CI_{95}$  except that we'd use 1.04 as our magic number rather than 1.96.

Unfortunately, this formula assumes that we actually know the true population standard deviation  $\sigma$ . In practice, we never really do know this, so we have to use an estimate of the standard deviation  $\hat{\sigma}$  instead. This is pretty straightforward to do, but (for reasons we'll talk about in Chapter 13) this has the consequence that we need to use the quantiles of the  $t$ -distribution rather than the normal distribution to calculate our magic number; and the answer depends on the sample size. When  $N$  is very large, we get pretty much the same value using `qt()` that we would if we used `qnorm()`...

```
> N <- 10000 # suppose our sample size is 10,000
> qt( p = .975, df = N-1) # calculate the 97.5th quantile of the t-dist
[1] 1.960201
```

But when  $N$  is small, we get a much bigger number when we use the  $t$  distribution:

```
> N <- 10 # suppose our sample size is 10
> qt( p = .975, df = N-1) # calculate the 97.5th quantile of the t-dist
[1] 2.262157
```

There's nothing too mysterious about what's happening here. Bigger values mean that the confidence interval is wider, indicating that we're more uncertain about what the true value of  $\mu$  actually is. When we use the  $t$  distribution instead of the normal distribution, we get bigger numbers, indicating that we have more uncertainty. And why do we have that extra uncertainty? Well, because our estimate of the population standard deviation  $\hat{\sigma}$  might be wrong! If it's wrong, it implies that we're a bit less sure about what our sampling distribution of the mean actually looks like... and this uncertainty ends up getting reflected in a wider confidence interval.

### 10.5.1 Calculating confidence intervals in R

As far as I can tell, the core packages in R don't include a simple function for calculating confidence intervals for the mean. They *do* include a lot of complicated, extremely powerful functions that can be used to calculate confidence intervals associated with lots of different things, such as the `confint()` function that we'll use in Chapter 15. But I figure that when you're first learning statistics, it might be useful to start with something simpler. As a consequence, the `lsr` package includes a function called `ciMean()` which you can use to calculate your confidence intervals. There are two arguments that you might want to specify:<sup>6</sup>

- `x`. This should be a numeric vector containing the data.
- `conf`. This should be a number, specifying the confidence level. By default, `conf = .95`, since 95% confidence intervals are the de facto standard in psychology.

So, for example, if I load the `afl124.Rdata` file, calculate the confidence interval associated with the mean attendance:

```
> ciMean( x = afl$attendance )
      2.5%      97.5%
31597.32 32593.12
```

Hopefully that's fairly clear.

### 10.5.2 Plotting confidence intervals in R

There's several different ways you can draw graphs that show confidence intervals as error bars. I'll show three versions here, but this certainly doesn't exhaust the possibilities. In doing so, what I'm assuming is that you want to draw is a plot showing the means and confidence intervals for one variable, broken down by different levels of a second variable. For instance, in our `afl` data that we discussed earlier, we might be interested in plotting the average `attendance` by `year`. I'll do this using three different functions, `bargraph.CI()`, `lineplot.CI()` (both of which are in the `sciplot` package), and `plotmeans()` (which is in the `gplots` package). First, let's load the data and the packages:

```
> load( "afl124.Rdata" ) # contains the "afl" data frame
> library( sciplot )     # bargraph.CI() and lineplot.CI() functions
> library( gplots )      # plotmeans() function
```

Here's how to plot the means and confidence intervals drawn using `bargraph.CI()`.

```
> bargraph.CI( x.factor = year,           # grouping variable
+             response = attendance,      # outcome variable
+             data = afl,                 # data frame with the variables
+             ci.fun= ciMean,             # name of the function to calculate CIs
+             xlab = "Year",              # x-axis label
+             ylab = "Average Attendance" # y-axis label
+ )
```

This produces the output shown in Figure 10.5. We can use the same arguments when calling the `lineplot.CI()` function:

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<sup>6</sup>As of the current writing, these are the only arguments to the function. However, I am planning to add a bit more functionality to `ciMean()`. However, regardless of what those future changes might look like, the `x` and `conf` arguments will remain the same, and the commands used in this book will still work.

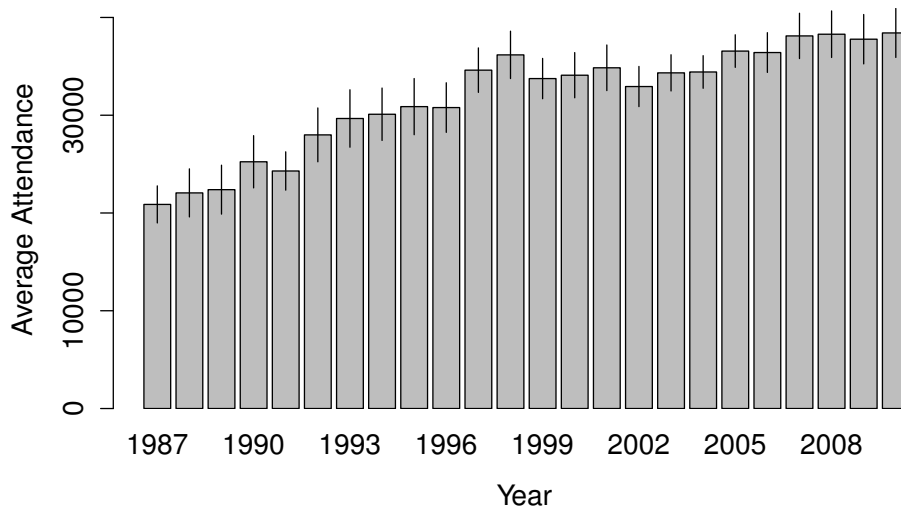


Figure 10.5: Means and 95% confidence intervals for AFL [attendance](#), plotted separately for each [year](#) from 1987 to 2010. This graph was drawn using the [bargraph.CI\(\)](#) function.

.....

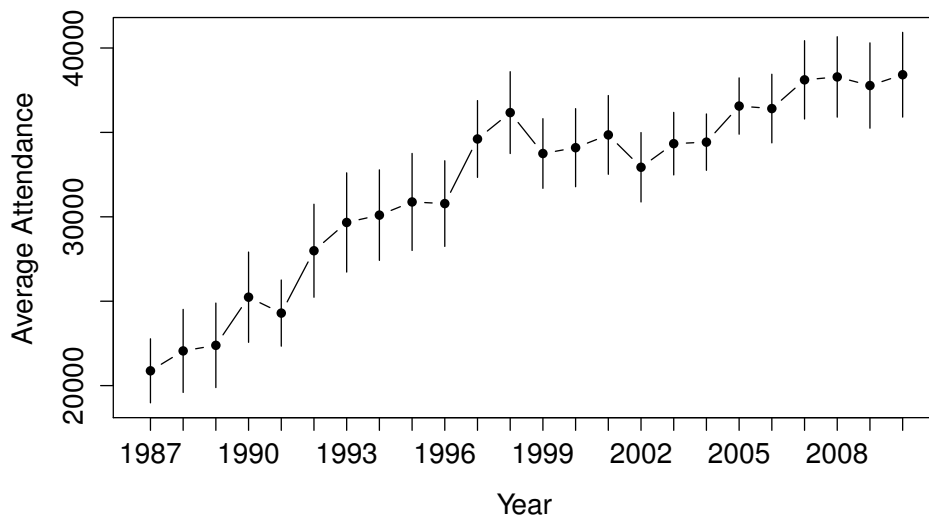


Figure 10.6: Means and 95% confidence intervals for AFL [attendance](#), plotted separately for each [year](#) from 1987 to 2010. This graph was drawn using the [lineplot.CI\(\)](#) function.

.....

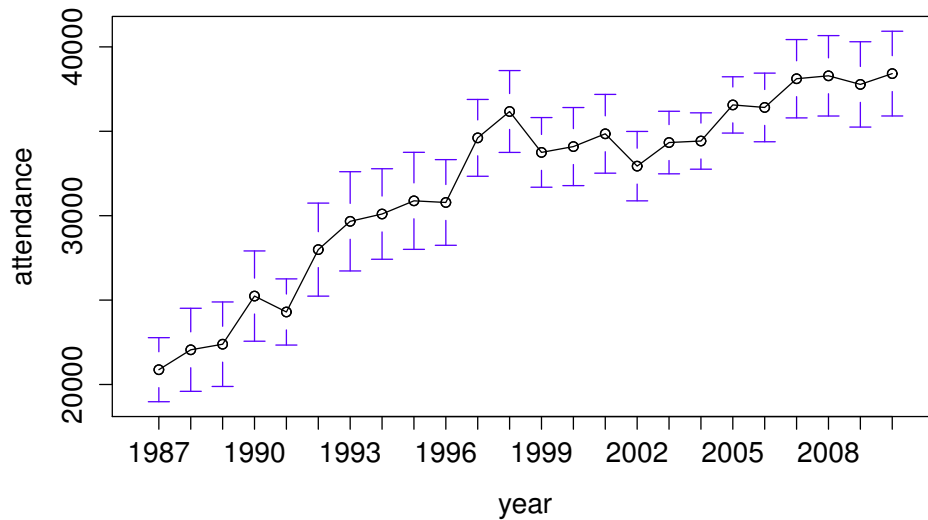


Figure 10.7: Means and 95% confidence intervals for AFL `attendance`, plotted separately for each `year` from 1987 to 2010. This graph was drawn using the `plotmeans()` function.

```
> lineplot.CI( x.factor = year,           # grouping variable
+             response = attendance,      # outcome variable
+             data = afl,                 # data frame with the variables
+             ci.fun= ciMean,             # name of the function to calculate CIs
+             xlab = "Year",              # x-axis label
+             ylab = "Average Attendance" # y-axis label
+ )
```

And the output for this command is shown in Figure 10.6. Finally, here's how you would do it using `plotmeans()`:

```
> plotmeans( formula = attendance ~ year, # outcome ~ group
+           data = afl,                   # data frame with the variables
+           n.label = FALSE                # don't show the sample sizes
+ )
```

This is shown in Figure 10.7.

### 10.5.3 Interpreting a confidence interval

The most counterintuitive thing about confidence intervals is how they are supposed to be interpreted. Whenever people first encounter confidence intervals, their first instinct is almost always to interpret it like this:

There is a 95% chance that the population mean falls within the 95% confidence interval.

This is the natural, intuitive and obvious way to think about the confidence interval. Unfortunately, it's technically incorrect to do this. Strictly speaking, however, you're not allowed to do this. Remember how, back in Section 9.6, I said that there were two warring theories of what the word "probability" means? And I said that it would turn out to matter some time? Well, that time is now.

The basic problem with the statement that I made above is that you're making a probabilistic statement about the true population mean (i.e., you're saying that there's a 95% chance that the population mean takes on a value that fall within some fixed range). However, confidence intervals are a tool invented within the frequentist paradigm, and the frequentist definition of probability forbids this. Remember, the frequentist definition of probability requires that replication is possible. Because, in order for a probability statement to be meaningful, you have to be able to imagine "repeating the procedure" over and over again. This works really well for some things: for instance, I *can* say that "the probability of a coin flip being heads is 0.5", because I can imagine flipping a coin millions of times. And if I did flip a coin a million times, I'd expect about half of those coin flips to land on heads. Cool.

Okay, now let's try this on for size: "there is a 95% probability that the average global temperature is between 15 and 20 degrees" (or whatever). According to the frequentist view, this is gibberish. I can't generate a million planet Earths and measure their temperature. Therefore, there's no way to assign a probability value to "global average temperatures". In general, frequentists *aren't* allowed to make probability claims about population parameters. For frequentists, probabilities attach only to estimates, not to parameters.

The solution that we adopt is to rewrite the statement so that we're making a probability claim about the interval itself, *not* the population mean. If we say something like this

95% of all confidence intervals constructed using this procedure will include the corresponding population mean

we're being clear about the fact that we're only making probability statements about the confidence interval, and not about the population mean. Stating things this way is kind of awkward, and practice no-one ever uses the explicitly frequentist statement. In fact, most people are quite happy to ignore the whole issue. But there are some people who get a bit pedantic about how confidence intervals should be interpreted, so as a rough guide it's helpful to think of it like this:

- "There is a **95% chance that a 95% confidence interval** will include the population mean." This statement seems to imply that the "95% chance" attaches to the confidence interval, so this is okay.
- "There is a **95% chance that the population mean** falls within the 95% CI." This statement seems to imply that the "95% chance" actually relates to the population mean. Occasionally people will ask you to rephrase this.

Kind of silly, isn't it?<sup>7</sup>

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<sup>7</sup>As it happens, there's a magic wand that we can wave over the confidence interval to make this idiotic problem go away. It's called "Bayesian probability". All you have to do is be willing to say that probabilities are "in the mind" and not "in the world", and this whole problem vanishes. And in fact, Bayesians have a nearly identical tool called a *credible interval* which behaves almost the same way as a confidence interval, except that you're allowed to interpret it the natural way.



as the necessary ground of possibility, Kant then proceeds to derive traditional predicates of God such as uniqueness, simplicity, immutability, and indeed even the claim that the necessary being is a mind.<sup>41</sup>

The introduction of God as the ground of all possibility must have seemed to Kant logically sounder than the ontological argument and theologically more orthodox than the Leibnizian conception, on which the power of God in the creation of the universe is constrained by the antecedent existence of determinate possible worlds. But in the *Critique of Pure Reason* Kant was ultimately to reject this argument as well as the three traditional ones, and to argue that both the existence and predicates of God could only be demonstrated on moral grounds, as practical beliefs rather than theoretical dogmas (A810–16/B838–44; A828–9/B856–7). Nevertheless, the underlying idea of Kant's argument, that a genuine or "real possibility" is not established just by demonstrating that a concept is free from contradiction but must have some sort of affirmative ground in actual existence, was remarkably deep-seated in Kant's thought, and would manifest itself again not just in the structure of Kant's theoretical philosophy but at crucial points in his practical philosophy as well.

The second main section of the *Only Possible Basis* shows Kant's early concern to find a proper characterization of scientific laws of nature, and reveals that Kant's complex view of teleology, or final causes, which seems to be a late accretion to the *Critique of Pure Reason*, touched on only in the appendix to the "Transcendental Dialectic" (A642–704/B670–732) and fully developed only in the *Critique of Judgment*, was actually a longstanding part of his thought. Against the background of the debate between occasionalism and preestablished harmony, Kant argues that God's purposes for the world would be expressed through unchanging natural laws valid throughout its entire history, and not through any miraculous episodic interventions: "Where nature operates in accordance with necessary laws, there will be no need for God to correct the course of events by direct intervention; for, in virtue of the necessity of the effects that occur in accordance with the order of nature, that which is displeasing to God cannot occur."<sup>42</sup> Thus Kant argues "That in the procedure of purified philosophy there prevails a rule which, even if it is not formally stated, is nonetheless always observed in practice . . . that in investigating the causes of certain effects one must pay careful attention to maintaining the unity of nature as far as possible."<sup>43</sup>

Here Kant defined an ideal of human knowledge that was to be central to the *Critique of Pure Reason* and all of his subsequent works, even as its theological foundation in a conception of God became ever more attenuated. To have knowledge of the events of an objective world beyond one's own consciousness is to subsume those events under causal laws, and to have knowledge of causal laws is to conceive of those laws

as themselves part of a system of laws that, if not actually created by God, can nevertheless only be conceived by us as if they had been created by an intelligence like but more powerful than ours.<sup>44</sup> Though Kant did not yet see how much effort this would involve, his task in the *Critique of Pure Reason* and subsequent works would be precisely to show that knowledge of the “unity of nature” or of constant laws of nature is the necessary condition of the unity of our own experience, and to explain how knowledge of such laws of nature itself is possible.

Kant’s thought about the problem of causal laws would be advanced further in the last of the four key works of 1762–63, the essay on *Negative Magnitudes*. But before we turn to that, we will consider the different steps in the direction of the *Critique* that Kant took in the third of these works, the *Inquiry concerning the Distinctness of the Principles of Natural Theology and Morality*. Kant wrote this work in the late fall of 1762 and submitted it to the Academy of Sciences in Berlin by 1 January 1763, the deadline for the Academy’s competition on the question of whether metaphysics, conceived to include natural theology and ethics, had the same prospects for certitude as mathematics and could use the same method. The Academy, still dominated by Wolffians, preferred Moses Mendelssohn’s elegant restatement of the fundamental tenets of Wolffianism for the first prize, but recognized the merits of Kant’s essay with an honorable mention and publication along with Mendelssohn’s essay (which did not take place until 1764).

In the rationalist tradition, Mendelssohn argued for the similarity of the methods of mathematics and philosophy – although with a twist, the suggestion that the certitude of metaphysics is even greater than that of mathematics. In an account of the epistemology of mathematics that would still be acceptable to many philosophers, he argued that the *proof* of mathematical theorems from their premises depends solely on the application of logical principles to mathematical concepts, but that the *truth* of mathematical propositions is an empirical matter, depending upon the incontestable but still observational fact that the basic concepts of our mathematics fit our experience. Mendelssohn then held that metaphysical argumentation proceeds for the most part along the same lines as mathematical proof, with the one difference that in two key cases the connection of the formal system of proof to reality does not have to be made empirically but is also secured on purely conceptual grounds. These two cases are the metaphysics of the soul (what Kant would later label “rational psychology”) where the Cartesian *cogito* proves the existence of the soul in a non-empirical way, and the metaphysics of God (or “rational theology”), where Mendelssohn accepted the ontological argument as proving the existence of God from the mere concept of God. Since in these two paradigmatic parts of philosophy existence claims could be proved without recourse even to the

most secure observation, Mendelssohn judged philosophy to have the potential for even greater certainty than mathematics.<sup>45</sup>

Although he wrote without prior knowledge of Mendelssohn's essay, Kant was of course familiar with the Wolffian background on which Mendelssohn was drawing, and in criticizing the methodological assumptions of Wolffianism more firmly than he had ever done before, Kant wrote an essay diametrically opposed to that of his competitor. This essay takes major steps toward the position of the *Critique of Pure Reason*, although crucial differences still remain. Kant's most radical departure from prevailing orthodoxy and his biggest step toward the *Critique* comes in his account of mathematical certainty. Instead of holding that mathematics proceeds by the two-front process of analyzing concepts on the one hand and confirming the results of those analyses by comparison with our experience on the other hand, Kant argues that in mathematics definitions of concepts, no matter how similar they may seem to those current in ordinary use, are artificially constructed by a process which he for the first time calls "synthesis," and that mathematical thinking gives itself objects "*in concreto*" for these definitions, or *constructs* objects for its own concepts from their definitions. Thus, whatever exactly the concept of a cone might signify in ordinary discourse, in mathematics the concept of a cone "is the product of the arbitrary representation of a right-angled triangle which is rotated on one of its sides."<sup>46</sup> Thus, we can have certain knowledge of the definition because we ourselves construct it; and we can have certain knowledge that the definition correctly applies to its objects because the true objects of mathematics are nothing but objects constructed, however that may be, in accordance with the definitions that we ourselves have constructed.

In philosophy, however, things are quite different. Philosophy does not begin from self-constructed and well-defined definitions, but from concepts, which are already given but are also given in a confused manner. Complete definitions of philosophical concepts come, if they come at all, at the end of philosophical inquiry. In fact, Kant insists, the goal of defining concepts – so central to the academic philosophy of the time – is not the goal of philosophy at all. Instead, Kant compares the proper method for philosophy to what he takes to be the method "introduced by Newton into natural science": obtaining certainty not about complete definitions but about "those characteristic marks that are certainly to be found in the concept of any general property" and can lead to "judgments about the object that are true and completely certain." The certainty of such judgments has to be grounded in something other than definitions, in the case of metaphysics in "an immediate and self-evident inner consciousness."<sup>47</sup> Such sources of evidence then have to be carefully analyzed for their implications, so while

“geometers acquire their concepts by means of *synthesis* . . . Philosophers can acquire their concepts only by means of *analysis* – and that completely changes the method of thought.”<sup>48</sup> Further, while from the definitions introduced into mathematics determinate objects can be constructed, this is not the case in philosophy, where the objects of knowledge are not our own constructs, and where our concepts give us only abstract and indeterminate knowledge of objects rather than determinate and concrete objects themselves. Thus “in mathematics, the object is considered under sensible signs *in concreto*, whereas in philosophy the object is only ever considered in universal abstracted concepts.”<sup>49</sup> So mathematical knowledge is certain because it is grounded on definitions of our own construction and fully determinate because concrete objects can be constructed from those definitions, whereas philosophical knowledge is less certain because it is dependent on the analysis of given concepts and less determinate because it yields only general judgments about objects.

Kant illustrates the differences between mathematical and philosophical method with three examples. First, following Crusius, he argues that metaphysics depends not only on two distinct formal or logical principles (as Kant had already argued in 1755), but also on many “first material principles of human reason” that are “indemonstrable,” such as “*a body is compound*.”<sup>50</sup> Second, he reiterates his argument of the *Only Possible Basis* that from the argument for the existence of God as the ground of all possibility other predicates of God can be derived – this is supposed to show how from a certain though incomplete consciousness of some of a thing’s characteristics other certain judgments can be derived – but also adds that in further judgments, about God’s justice and goodness, only an “approximation to certainty” is possible.<sup>51</sup> Finally, about morality Kant argues that although we may easily be able to identify some *formal* principles of obligation, such as “I ought to advance the total greatest perfection,” such principles are useless without *material* principles of obligation, which tell us what the extension of an abstract concept like perfection actually is – what courses of action actually contribute to perfection – and such material principles are themselves indemonstrable.<sup>52</sup>

Kant is here clearly working his way toward several of the central ideas of the *Critique of Pure Reason*. Although he does not yet speak of analytic or synthetic *judgments*, his distinction between analytic and synthetic *methods* is leading in that direction: whereas traditionally this contrast between methods was merely a contrast between direction in causal or syllogistic inference,<sup>53</sup> for Kant the difference has become one between constructing concepts or their definitions (the synthetic method) and unpacking concepts to get to definitions (the analytical method). This will lead to the distinction between judgments that con-

struct fuller concepts by amplifying what is given (synthetic judgments) and those that merely explicate given concepts by showing what predicates they already contain (analytic judgments) (see A 6–7 / B 10–11). Further, Kant's argument that both metaphysics and morality depend upon indemonstrable material principles, and not just formal or logical principles, is clearly preparing the way for the fundamental tenet of his mature theoretical and practical philosophy that the basic propositions of both are synthetic yet *a priori* judgments. But Kant's conception of philosophical method in the *Inquiry* has not yet caught up to this recognition: he is at a loss to explain how we know these "indemonstrable" principles when the method of philosophy is still considered to be analytic, rather than synthetic like the method of mathematics. Before Kant's mature work could be written, he would have to discover a philosophical method that could yield "material" or synthetic judgments. This would be the philosophical work of the 1770s that would finally pave the way for the *Critique of Pure Reason*.

Once Kant takes this further step, however, the contrast between mathematics and philosophy provided in the *Inquiry* will have to be revised. The difference between mathematics and philosophy will no longer simply be that the former uses the synthetic method and the latter the analytical method. On Kant's mature account, both mathematics and philosophy must use a synthetic method. This does not mean that the account of the *Inquiry* will be completely surrendered, but rather that the difference between the concrete constructions of mathematics and the abstract results of philosophy will have to be recast as a difference *within* the synthetic method: The use of the synthetic method in mathematics will yield synthetic yet certain results about *determinate objects*, whereas the use of the synthetic method in philosophy will yield synthetic yet certain *principles for the experience of objects*, or what Kant will call "schemata" of the pure concepts of the understanding, "the true and sole conditions for providing [these concepts] with a relation to objects" (A 146 / B 185). Thus the *Inquiry* already contains key aspects of Kant's mature theory of mathematics, but does not yet see that both mathematics and philosophy must use synthetic methods. Once Kant sees this, however, then the *Inquiry's* distinction between the concrete results of mathematics and the abstract results of philosophy can be retained as the difference between the construction of determinate mathematical objects and the construction of philosophical principles for the possibility of the experience of objects in general.<sup>54</sup>

The last of the essays of 1762–63, the *Attempt to Introduce the Concept of Negative Magnitudes into Philosophy*, focuses on a substantive rather than a methodological issue. Kant considers a variety of relationships that must be construed as real opposition rather than logical contradiction: positive and negative numbers, motion in opposite directions,

# Preface

It is sometimes hard for me to believe that the first edition of this book was only 330 pages and 13 chapters long! The book has grown and been adapted to keep up with the fast pace of change in derivatives markets.

Like earlier editions, the book serves several markets. It is appropriate for graduate courses in business, economics, financial mathematics, and financial engineering. It can be used on advanced undergraduate courses when students have good quantitative skills. Also, many practitioners who are involved in derivatives markets find the book useful. I am delighted that half the purchasers of the book are analysts, traders, and other professionals in derivatives and risk management.

One of the key decisions that must be made by an author who is writing in the area of derivatives concerns the use of mathematics. If the level of mathematical sophistication is too high, the material is likely to be inaccessible to many students and practitioners. If it is too low, some important issues will inevitably be treated in a rather superficial way. I have tried to be particularly careful about the way I use both mathematics and notation in the book. Nonessential mathematical material has been either eliminated or included in end-of-chapter appendices and in the technical notes on my website. Concepts that are likely to be new to many readers have been explained carefully, and many numerical examples have been included.

*Options, Futures, and Other Derivatives* can be used for a first course in derivatives or for a more advanced course. There are many different ways it can be used in the classroom. Instructors teaching a first course in derivatives are likely to want to spend most classroom time on the first half of the book. Instructors teaching a more advanced course will find that many different combinations of chapters in the second half of the book can be used. I find that the material in Chapter 35 works well at the end of either an introductory or an advanced course.

## ***What's New?***

Material has been updated and improved throughout the book. The changes in the eighth edition include the following:

1. There is a new chapter (Chapter 8) devoted to securitization and the credit crisis. The events in financial markets since the seventh edition was published make these topics particularly relevant.
2. There is more discussion (Chapter 33) of the way commodity prices are modeled and how commodity derivatives are valued. Energy derivatives and other commodity derivatives have become progressively more important in recent years.

3. The chapter on hedging using futures (Chapter 3) has been simplified and an appendix explaining the capital asset pricing model has been included. This was suggested by a number of instructors.
4. Material on central clearing, liquidity risk, and overnight indexed swaps has been included. Following the credit crisis, these are features of derivatives markets that all students need to understand.
5. An appendix to Chapter 12 shows that the Black–Scholes–Merton formula can be derived as the limiting case of a binomial tree. Some instructors like to introduce the Black–Scholes–Merton result this way.
6. The material on value at risk is developed using an example involving real data taken from the credit crisis. Spreadsheets for the example are on my website. This change makes the material more interesting for readers and allows richer assignment questions to be used by instructors.
7. New material has been added on topics such as principal-protected notes, gap options, cliquet options, and jump processes, reflecting their importance in derivatives markets.
8. More material has been added on applications of the Vasicek and CIR models. This material provides a way in which readers can improve their understanding of key concepts. It is particularly important for actuarial students and fund managers.
9. There are a number of enhancements to the DerivaGem software. The software now covers credit derivatives. A version of the software is provided that can be used with Open Office by Mac and Linux users. In response to many requests from users, the code is provided for the DerivaGem functions. The software is now much easier to install and a “Getting Started” section is included on page 812.
10. The Test Bank available to adopting instructors has been improved.
11. New end-of-chapter problems have been added.

## **Software**

DerivaGem version 2.01 is included with this book. It consists of two Excel applications: the *Options Calculator* and the *Applications Builder*. The Options Calculator consists of easy-to-use software for valuing a wide range of options. The Applications Builder consists of a number of Excel functions from which users can build their own applications. A number of sample applications are included to enable students to explore the properties of options and numerical procedures more easily. The Applications Builder also allows more interesting assignments to be designed.

The latest version of the software allows credit derivatives to be valued. A version of the software’s functions that is compatible with Open Office for Mac and Linux users is now provided, and users can now access the code for the functions underlying DerivaGem.

The description of the software starting on page 812 includes a “Getting Started” section. Updates to the software can be downloaded from my website:

[www.rotman.utoronto.ca/~hull](http://www.rotman.utoronto.ca/~hull).

## **Slides**

Several hundred PowerPoint™ slides can be downloaded from Pearson’s Instructor Resource Center ([www.pearsonglobaleditions.com/hull](http://www.pearsonglobaleditions.com/hull)). Instructors who adopt the text may adapt the slides to meet their own needs.

## **Test Bank**

The Test Bank has been improved and provides a wealth of multiple-choice and short-calculation questions that can be used by instructors for testing. It can be downloaded from the Instructor Resource Center at [www.pearsonglobaleditions.com/hull](http://www.pearsonglobaleditions.com/hull).

## **Solutions Manual**

End-of-chapter problems are divided into two groups: “Questions and Problems” and “Further Questions”. Solutions to the Questions and Problems are in *Options, Futures, and Other Derivatives 8e: Solutions Manual*, which is published by Pearson and can be purchased by students.

## **Instructors Manual**

The Instructors Manual contains solutions to both “Practice Questions” and “Further Questions”, notes on the teaching of each chapter, test bank questions, notes on course organization, and some relevant Excel worksheets. It is available for download from the Instructor Resource Center at [www.pearsonglobaleditions.com/hull](http://www.pearsonglobaleditions.com/hull).

## **Technical Notes**

Technical Notes are used to elaborate on points made in the text. They are referred to in the text and can be downloaded from [www.rotman.utoronto.ca/~hull/TechnicalNotes](http://www.rotman.utoronto.ca/~hull/TechnicalNotes). By not including the Technical Notes in the book, I am able to streamline the presentation of material so that it is more student-friendly.

## **Acknowledgments**

Many people have played a part in the development of successive editions of this book. Indeed, the list of people who have provided me with feedback on the book is now so long that it is not possible to mention everyone. I have benefited from the advice of many academics who have taught from the book and from the comments of many derivatives practitioners. I would like to thank the students on my courses at the University of Toronto who have made many suggestions on how the material can be improved. Eddie Mizzi from The Geometric Press did an excellent job editing the final manuscript and handling page composition. Emilio Barone from Luiss Guido Carli University in Rome provided many detailed comments.

Alan White, a colleague at the University of Toronto, deserves a special acknowledgement. Alan and I have been carrying out joint research and consulting in the areas of derivatives and risk management for over 25 years. During that time, we have spent many hours discussing key issues. Many of the new ideas in this book, and many of the new ways used to explain old ideas, are as much Alan’s as mine. Alan has done most of the development work on the DerivaGem software.

Special thanks are due to many people at Pearson, particularly Tessa O’Brien, Donna Battista, and Nancy Fenton for their enthusiasm, advice, and encouragement. I welcome comments on the book from readers. My e-mail address is:

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*The American signers of the Declaration of Independence had reason to fear for their necks. In 1802, twenty-six years later, George III (1738–1820) approved this death sentence for seven Irish rebels:*

“. . . [You] are to be hanged by the neck, but not until you are dead; for while you are still living your bodies are to be taken down, your bowels torn out and burned before your faces, your heads then cut off, and your bodies divided each into four quarters, and your heads and quarters to be then at the King's disposal; and may the Almighty God have mercy on your souls.”

The formal Declaration of Independence cleared the air as a thundershower does on a muggy day. Foreign aid could be solicited with greater hope of success. Those Patriots who defied the king were now rebels, not loving subjects shooting their way into reconciliation. They must all hang together, Franklin is said to have grimly remarked, or they would all hang separately. Or, in the eloquent language of the great declaration, “We mutually pledge to each other our lives, our fortunes and our sacred honor.”

Jefferson's defiant Declaration of Independence had a universal impact unmatched by any other American document. This “shout heard round the world” has been a source of inspiration to countless revolutionary movements against arbitrary authority. Lafayette hung a copy on a wall in his home, leaving beside it room for a future French Declaration of the Rights of Man—a declaration that was officially born thirteen years later.



### **Patriots and Loyalists**

The War of Independence, strictly speaking, was a war within a war. Colonials loyal to the king (Loyalists) fought the American rebels (Patriots), while the rebels also fought the British redcoats (see “Makers of America: The Loyalists,” pp. 148–149). Loyalists were derisively

called “Tories,” after the dominant political factions in Britain, whereas Patriots were called “Whigs,” after the opposition factions in Britain. A popular definition of a Tory among the Patriots betrayed bitterness: “A Tory is a thing whose head is in England, and its body in America, and its neck ought to be stretched.”

Like many revolutions, the American Revolution was a minority movement. Many colonists were apathetic or neutral, including the Byrds of Virginia, who sat on the fence. The opposing forces contended not only against each other but also for the allegiance and support of the civilian population. In this struggle for the hearts and minds of the people, the British proved fatally inept, and the Patriot militias played a crucial role. The British military proved able to control only those areas where it could maintain a massive military presence. Elsewhere, as soon as the redcoats had marched on, the rebel militiamen appeared and took up the task of “political education”—sometimes by coercive means. Often lacking bayonets but always loaded with political zeal, the ragtag militia units served as remarkably effective agents of Revolutionary ideas. They convinced many colonists, even those indifferent to independence, that the British army was an unreliable friend and that they had better throw in their lot with the Patriot cause. They also mercilessly harassed small British detachments and occupation forces. One British officer ruefully observed that “the Americans would be less dangerous if they had a regular army.”

Loyalists, numbering perhaps 16 percent of the American people, remained true to their king. Families often split over the issue of independence: Benjamin Franklin supported the Patriot side, whereas his handsome illegitimate son, William Franklin (the last royal governor of New Jersey), upheld the Loyalist cause.

The Loyalists were tragic figures. For generations the British in the New World had been taught fidelity to the crown. Loyalty is ordinarily regarded as a major virtue—loyalty to one's family, one's friends, one's country. If the king had triumphed, as he seemed likely to do, the Loyalists would have been acclaimed patriots, and defeated rebels like Washington would have been disgraced, severely punished, and probably forgotten.

Many people of education and wealth, of culture and caution, remained loyal. These wary souls were satisfied with their lot and believed that any violent change would only be for the worse. Loyalists were also more numerous among the older generation. Young people make revolutions, and from the outset energetic, purposeful, and militant young people surged forward—



## EXAMINING THE EVIDENCE

**A Revolution for Women? Abigail Adams Chides Her Husband, 1776** In the midst of the revolutionary fervor of 1776, at least one woman—Abigail Adams, wife of noted Massachusetts Patriot (and future president) John Adams—raised her voice on behalf of women. Yet she apparently raised it only in private—in this personal letter to her husband. Private documents like the correspondence and diaries of individuals both prominent and ordinary offer invaluable sources for the historian seeking to discover sentiments, opinions, and perspectives that are often difficult to discern in the official public record. What might it suggest about the historical circumstances of the 1770s that Abigail Adams confined her claim for women's equality to this confidential exchange with her spouse? What might have inspired the arguments she employed? Despite her privileged position and persuasive power, and despite her threat to “foment a rebellion,” Abigail Adams's plea went largely unheeded in the Revolutionary era—as did comparable pleadings to extend the revolutionary principle of equality to blacks. What might have accounted for this limited application of the ideas of liberty and equality in the midst of a supposedly democratic revolution?

the House and Committee of the Solicitor General have taken a way to their own private party— surely the new friends feel a prevalent awe for British patriotism, whilst thus Delist the genocide & traitors —

I feel very differently at the approach of Spring to what I did a month ago, I know not then whether we could plant or live with safety, whether when we had till we could reap the fruits of our own industry, whether we could stay in our own cottages, or whether we should not be driven from the sea coasts to seek shelter in the wilderness but now we feel as if we might sit under our own vine and eat the fruit of the land — I feel a quietude to which before I was a stranger, I think the sun looks brighter the birds sing more melodiously, & nature puts on a more cheerful countenance — we feel a temporary peace, the fugitives are returning to their deserted habitations

As we breathe ourselves, we sympathize with those who are humbling left the lot of bottom should be theirs — they cannot have similar circumstances unless propriety & civility should take possession of them — they have time & warning given them to see the evils then it — I long to hear that you have declared our independency — and by the way in the new code of laws which I suppose it will be necessary for you to make I desire you would remember the ladies, & be more generous & favourable to them than your ancestors do not put such unlimited power into the hands of the husbands, remember all men would be tyrants if they could. if particular care & attention is not paid to the ladies we are determined to foment a rebellion, and will not hold ourselves bound by any laws in which we have no voice, or representation — that your sex are naturally

the evils then it — I long to hear that you have declared our independency — and by the way in the new code of laws which I suppose it will be necessary for you to make I desire you would remember the ladies, & be more generous & favourable to them than your ancestors do not put such unlimited power into the hands of the husbands, remember all men would be tyrants if they could. if particular care & attention is not paid to the ladies we are determined to foment a rebellion, and will not hold ourselves bound by any laws in which we have no voice, or representation — that your sex are naturally





## The Loyalists

In late 1776 Catherine Van Cortlandt wrote to her husband, a New Jersey merchant fighting in a Loyalist brigade, about the Patriot troops who had quartered themselves in her house. “They were the most disorderly of species,” she complained, “and their officers were from the dregs of the people.”

Like the Van Cortlandts, many Loyalists thought of themselves as the “better sort of people.” They viewed their adversaries as “lawless mobs” and “brutes.” Conservative, wealthy, and well-educated, Loyalists of this breed thought a break with Britain would invite anarchy. Loyalism made sense to them, too, for practical reasons. Viewing colonial militias as no match for His Majesty’s army, Loyalist pamphleteer Daniel Leonard warned his Patriot enemies in 1775 that “nothing short of a miracle could gain you one battle.”

But Loyalism was hardly confined to the well-to-do. It also appealed to many people of modest means who identified strongly with Britain or who had reason to fear a Patriot victory. Thousands of British veterans of the Seven Years’ War, for example, had settled in the colonies after 1763. Many of them took up farming on

two-hundred-acre land grants in New York. They were loath to turn their backs on the crown. So, too, were recent immigrants from non-English regions of the British Isles, especially from Scotland and Ireland, who had settled in Georgia or the backcountry of North and South Carolina. Many of these newcomers, resenting the plantation elite who ran these colonies, filled the ranks of Tory brigades such as the Volunteers of Ireland and the North Carolina Highlanders, organized by the British army to galvanize Loyalist support.

Other ethnic minorities found their own reasons to support the British. Some members of Dutch, German, and French religious sects believed that religious tolerance would be greater under the British than under the Americans, whose prejudices they had already encountered. Above all, thousands of African Americans joined Loyalist ranks in the hope that service to the British might offer an escape from bondage. British officials encouraged that belief. Throughout the war and in every colony, some African Americans fled to British lines, where they served as soldiers, servants, laborers, and spies. Many of them joined black regiments that



### Loyalists Take Flight

This watercolor shows an encampment on the St. Lawrence River of Loyalists who had fled the rebellious colonies for the safe haven of Canada, where they applied to the British government for land grants.







**New York Patriots Pull Down the Statue of King George III**  
Erected after the repeal of the Stamp Act in 1766, this statue was melted down by the revolutionaries into bullets to be used against the king's troops.

figures like the sleeplessly scheming Samuel Adams and the impassioned Patrick Henry. His flaming outcry before the Virginia Assembly—"Give me liberty or give me death!"—still quickens patriotic pulses.

Loyalists also included the king's officers and other beneficiaries of the crown—people who knew which side their daily bread came from. The same was generally true of the Anglican clergy and a large portion of their congregations, all of whom had long been taught submission to the king.

Usually the Loyalists were most numerous where the Anglican Church was strongest. A notable exception was Virginia, where the debt-burdened Anglican aristocrats flocked into the rebel camp. The king's followers were well entrenched in aristocratic New York City and Charleston, and also in Quaker Pennsylvania and New Jersey, where General Washington felt that he was fighting in "the enemy's country." While his men were starving at Valley Forge, nearby Pennsylvania farmers were selling their produce to the British for the king's gold.

Loyalists were least numerous in New England, where self-government was especially strong and mercantilism was especially weak. Rebels were the most numerous where Presbyterianism and Congregationalism flourished, notably in New England. Invading British armies vented their contempt and anger by using Yankee churches for pigsties.



### The Loyalist Exodus

Before the Declaration of Independence in 1776, persecution of the Loyalists was relatively mild. Yet they were subjected to some brutality, including tarring and feathering and riding astride fence rails.

After the Declaration of Independence, which sharply separated Loyalists from Patriots, harsher methods prevailed. The rebels naturally desired a united front. Putting loyalty to the colonies first, they regarded their opponents, not themselves, as traitors. Loyalists were roughly handled, hundreds were imprisoned, and a few noncombatants were hanged. But there was no wholesale reign of terror comparable to that which later bloodied both France and Russia during their revolutions. For one thing, the colonists reflected Anglo-Saxon regard for order; for another, the leading Loyalists were prudent enough to flee to the British lines.

About eighty thousand loyal supporters of George III were driven out or fled, but several hundred thousand or so of the mild Loyalists were permitted to stay. The estates of many of the fugitives were confiscated and sold—a relatively painless way to help finance the war. Confiscation often worked great hardship, as, for example, when two aristocratic women were forced to live in their former chicken house for leaning Toryward.





**Washington Crossing the Delaware, by Emanuel Gottlieb Leutze, 1851** On Christmas Day, 1776, George Washington set out from Pennsylvania with twenty-four hundred men to surprise the British forces, chiefly Hessians, in their quarters across the river in New Jersey. The subsequent British defeat proved to be a turning point in the Revolution, as it checked the British advance toward Philadelphia and restored American morale. Seventy-five years later, Leutze, a German American immigrant who had returned to Germany, mythologized the heroic campaign in this painting. Imbued with the liberal democratic principles of the American Revolution, Leutze intended his painting to inspire Europeans in their revolutions of 1848. To that end, he ignored the fact that the Stars and Stripes held by Lieutenant James Monroe was not adopted until 1777; that Washington could not possibly have stood so long on one leg; that the colonists crossed the Delaware at night, not during the day; and that no African American would have been present. What Leutze did capture was the importance of ordinary men in the Revolutionary struggle and the tremendous urgency they felt at this particular moment in 1776, when victory seemed so elusive.

Some fifty thousand Loyalist volunteers at one time or another bore arms for the British. They also helped the king's cause by serving as spies, by inciting the Indians, and by keeping Patriot soldiers at home to protect their families. Ardent Loyalists had their hearts in their cause, and a major blunder of the haughty British was not to make full use of them in the fighting.



### General Washington at Bay

With Boston evacuated in March 1776, the British concentrated on New York as a base of operations. Here was a splendid seaport, centrally located, where the

king could count on cooperation from the numerous Loyalists. An awe-inspiring British fleet appeared off New York in July 1776. It consisted of some five hundred ships and thirty-five thousand men—the largest armed force to be seen in America until the Civil War. General Washington, dangerously outnumbered, could muster only eighteen thousand ill-trained troops with which to meet the crack army of the invader.

Disaster befell the Americans in the summer and fall of 1776. Outgeneraled and outmaneuvered, they were routed at the Battle of Long Island, where panic seized the raw recruits. By the narrowest of margins, and thanks to a favoring wind and fog, Washington escaped to Manhattan Island. Retreating northward, he crossed the Hudson River to New Jersey and finally

〔三〕正義 祓音廢，又音拂。齋音札皆反。祓謂除不祥求福也。

〔三〕正義 音至。周公祓齋，自以贊幣告三王，請代武王，武王病乃瘳也。

〔四〕集解 徐廣曰：「封禪書曰『武王克殷二年，天下未寧而崩』。」皇甫謐曰：「武王定位元年歲在乙酉，六年庚寅崩。」駟按：皇覽曰「文王、武王、周公冢皆在京兆長安鎬聚東社中也」。〔正義〕括地志云：「武王墓在雍州萬年縣西南二十八里畢原上也。」

成王少，周初定天下，周公恐諸侯畔周，公乃攝行政當國。管叔、蔡叔羣弟疑周公，與武庚作亂，畔周。周公奉成王命，伐誅武庚、管叔，放蔡叔。以微子開代殷後，國於宋。〔二〕頗收殷餘民，以封武王少弟封爲衛康叔。〔三〕晉唐叔得嘉穀，〔三〕獻之成王，成王以歸周公于兵所。〔四〕周公受禾東土，魯天子之命。〔五〕初，管、蔡畔周，周公討之，三年而畢定，故初作大誥，次作微子之命，〔六〕次歸禾，次嘉禾，次康誥、酒誥、梓材，〔七〕其事在周公之篇。周公行政七年，成王長，周公反政成王，北面就羣臣之位。

〔二〕正義 今宋州也。

〔三〕正義 尚書洛誥云：「我卜瀍水東，亦惟洛食，以居邠、鄘、衛之衆。」又多士篇序云：「成周既成，遷殷頑民。」按：是爲東周，古洛陽城也。括地志云：「洛陽故城在洛州洛陽縣東北二十六里，周公所築，卽成周城也。輿地志云：『以周地在王城東，故曰東周。敬王避子朝亂，自洛邑東居此。以其迫阨不受王都，故壞翟泉而廣之。』」按：武王



滅殷國爲鄒、衛，三監尹之。武庚作亂，周公滅之，徙三監之民於成周，頗收其餘衆，以封康叔爲衛侯，卽今衛州是也。孔安國云「以三監之餘民，國康叔爲衛侯。周公懲其數叛，故使賢母弟主之」也。

〔三〕集解 鄭玄曰：「二苗同爲一穗。」

〔四〕集解 徐廣曰：「歸，一作『餽』。」

〔五〕集解 徐廣曰：「尙書序云『旅天子之命』。」

〔六〕集解 孔安國曰：「封命之書。」

〔七〕集解 孔安國曰：「告康叔以爲政之道，亦如梓人之治材也。」

成王在豐，使召公復營洛邑，如武王之意。周公復卜申視，卒營築，居九鼎焉。曰：「此天下之中，四方入貢道里均。」作召誥、洛誥。成王既遷殷遺民，周公以王命告，作多士、無佚。召公爲保，周公爲師，東伐淮夷，殘奄，〔一〕遷其君薄姑。〔二〕成王自奄歸，在宗周，〔三〕作多方。〔四〕既紂殷命，襲淮夷，歸在豐，作周官。〔五〕興正禮樂，度制於是改，而民和睦，頌聲興。〔六〕成王既伐東夷，息慎來賀，王賜榮伯，作賄息慎之命。〔七〕

〔一〕集解 鄭玄曰：「奄國在淮夷之北。」

〔二〕正義 奄音於險反。括地志云：「泗（水）（州）徐城縣北三十里古徐國，卽

淮夷也。兗州曲阜縣奄里，卽奄國之地也。」

〔三〕集解 馬融曰：「齊地。」

〔四〕正義 括地志云：「薄姑故城在青州博昌縣東北六十里。薄姑氏，殷諸侯，封於此，周

滅之也。」

〔三〕正義 伐奄歸鎬京也。

〔四〕集解 孔安國曰：「告衆方天下諸侯。」

〔五〕集解 孔安國曰：「言周家設官分職用人之法。」古文尙書序，周官，書篇名。

〔六〕集解 何休曰：「頌聲者，太平歌頌之聲，帝王之高致也。」

〔七〕集解 孔安國曰：「賄，賜也。」馬融曰：「榮伯，周同姓，畿內諸侯，爲卿大夫也。」

成王將崩，懼太子釗之不任，〔一〕乃命召公、畢公率諸侯以相太子而立之。成王既崩，二公率諸侯，以太子釗見於先王廟，申告以文王、武王之所以爲王業之不易，務在節儉，毋多欲，以篤信臨之，作顧命。〔二〕太子釗遂立，是爲康王。康王卽位，徧告諸侯，宣告以文武之業以申之，作康誥。故成康之際，天下安寧，刑錯四十餘年不用。〔三〕康王命作策，畢公分居里，成周郊，〔四〕作畢命。

〔一〕正義 釗音招，又古堯反。任，而針反。

〔二〕集解 鄭玄曰：「臨終出命，故謂之顧。顧，將去之意也。」

〔三〕集解 應劭曰：「錯，置也。民不犯法，無所置刑。」

〔四〕集解 孔安國曰：「分別民之居里，異其善惡也。成定東周郊境，使有保護也。」

康王卒，子昭王瑷立。昭王之時，王道微缺。昭王南巡狩不返，卒於江上。其卒不赴告，諱之也。〔一〕立昭王子滿，是爲穆王。穆王卽位，春秋已五十矣。王道衰微，穆王閱文武

之道缺，乃命伯禦〔三〕申誠〔三〕太僕〔四〕國之政，作禦命〔五〕復寧。

〔二〕正義帝王世紀云：「昭王德衰，南征，濟于漢，船人惡之，以膠船進王，王御船至中流，膠液船解，王及祭公俱沒于水中而崩。其右辛游靡長臂且多力，游振得王，周人諱之。」

〔三〕集解孔安國曰：「伯問，臣名也。」

〔三〕集解徐廣曰：「一作『部』。」

〔四〕集解應劭曰：「太僕，周穆王所置。蓋太御衆僕之長，中大夫也。」

〔五〕正義尚書序云：「穆王令伯禦爲太僕正。」應劭云：「太僕，周穆王所置。蓋太御衆僕之長，中大夫也。」

穆王將征犬戎，〔二〕祭公謀父諫曰：〔三〕「不可。先王耀德不觀兵。夫兵戢而時動，動則威，觀則玩，玩則無震。」〔三〕是故周文公之頌曰：〔四〕「載戢干戈，載櫜弓矢，〔五〕我求懿德，肆于時夏，允王保之。」〔六〕先王之於民也，茂正其德而厚其性，阜其財求而利其器用，明利害之鄉，〔七〕以文脩之，使之務利而辟害，懷德而畏威，故能保世以滋大。昔我先王世后稷〔八〕以服事虞、夏。及夏之衰也，〔九〕弃稷不務，〔一〇〕我先王不畀用失其官，而自竄於戎狄之間。不敢怠業，時序其德，遵脩其緒，〔一一〕脩其訓典，朝夕恪勤，守以敦篤，奉以忠信。奕世載德，不忝前人。〔一二〕至于文王、武王，昭前之光明而加之以慈和，事神保民，無不欣喜。商王帝辛大惡于民，庶民不忍，訖載武王，以致戎于商牧。〔一三〕是故先王非務武也，勤恤民隱而除其害。



也。夫先王之制，邦內甸服，邦外侯服，侯衛賓服，<sup>〔一〕</sup>夷蠻要服，<sup>〔二〕</sup>貉翟荒服。甸服者祭，<sup>〔三〕</sup>侯服者祀，<sup>〔四〕</sup>賓服者享，<sup>〔五〕</sup>要服者貢，<sup>〔六〕</sup>荒服者王。<sup>〔七〕</sup>日祭，月祀，時享，歲貢，終王。先王之順祀也，<sup>〔八〕</sup>有不祭則脩意，<sup>〔九〕</sup>有不祀則脩言，<sup>〔一〇〕</sup>有不享則脩文，<sup>〔一一〕</sup>有不貢則脩名，<sup>〔一二〕</sup>有不王則脩德，<sup>〔一三〕</sup>序成而有不至則脩刑。<sup>〔一四〕</sup>於是有刑不祭，伐不祀，征不享，讓不貢，告不王。於是有刑罰之辟，有攻伐之兵，有征討之備，有威讓之命，有文告之辭。布令陳辭而有不至，則增脩於德，無勤民於遠。是以近無不聽，遠無不服。今自大畢、伯士之終也，<sup>〔一五〕</sup>犬戎氏以其職來王，<sup>〔一六〕</sup>天子曰<sup>〔一七〕</sup>『予必以不享征之，且觀之兵』，無乃廢先王之訓，而王幾頓乎？<sup>〔一八〕</sup>吾聞犬戎樹敦，<sup>〔一九〕</sup>率舊德而守終純固，其有以禦我矣。』王遂征之，得四白狼四白鹿以歸。自是荒服者不至。

〔一〕集解 徐廣曰：「一作『獸』。」

〔二〕集解 韋昭曰：「祭，畿內之國，周公之後，爲王卿士。謀父，字也。」正義 括地志云：「故祭城在鄭州管城縣東

北十五里，鄭大夫祭仲邑也。釋例云『祭城在河南，上有敖倉，周公後所封也』。」

〔三〕集解 韋昭曰：「震，懼也。」

〔四〕集解 韋昭曰：「文公，周公旦之諡。」

〔五〕集解 唐固曰：「疊，韜也。」

〔六〕集解 韋昭曰：「言武王常求美德，故陳其功於是夏而歌之。信哉武王能保此時夏之美。樂章大者曰夏。」

〔七〕集解 韋昭曰：「鄉，方也。」

〔八〕集解 韋昭曰：「謂弃與不畱也。」唐固曰：「父子相繼曰世。」

〔九〕正義 謂太康也。

〔一〇〕正義 言太康弃廢稷官。

〔一一〕集解 徐廣曰：「遵，一作『選』。」

〔一二〕正義 前人謂后稷也。言不畱亦世載德，不忝后稷。及文王、武王，無不務農事。

〔一三〕正義 紂近郊地，名牧野。

〔一四〕集解 韋昭曰：「此總言之也。侯，侯圻；衛，衛圻也。」

〔一五〕集解 韋昭曰：「供日祭。」

〔一六〕集解 韋昭曰：「供月祀。」

〔一七〕集解 韋昭曰：「供時享。」

〔一八〕集解 韋昭曰：「供歲貢。」

〔一九〕集解 韋昭曰：「王，王事天子也。詩曰『莫敢不來王』。」

〔二〇〕集解 徐廣曰：「外傳云『先王之訓』。」

〔二一〕集解 韋昭曰：「先脩志意以自責也。畿內近，知王意也。」

〔二二〕集解 韋昭曰：「言號令也。」

〔二三〕集解 韋昭曰：「文，典法也。」