

To Our Participants

6

Who We Serve

8

Products and Services Glossary

12

Core Services

16

Mutual Fund Services

19

**Insurance Services** 

20

**Government Securities** 

21

Mortgage-Backed Securities

22

**International Services** 

23

Internet

26

Timeline

30

Board of Directors

33

Financial Review

**National Securities Clearing Corporation** 

National Securities Clearing Corporation (NSCC) is the nation's leading provider of centralized clearance, settlement and information services for equities, bonds, mutual fund and annuity transactions to more than 2,000 brokers, dealers, banks, mutual funds, insurance carriers and financial organizations. Government Securities Clearing Corporation (GSCC), an affiliate, clears and settles a broad range of U.S. Government securities, including Treasury bills, bonds, notes, zero coupon securities and repurchase agreements. MBS Clearing Corporation (MBSCC), an affiliate, is this market's sole provider of clearance, netting and electronic pool notification services for mortgage-backed securities. International Securities Clearing Corporation (ISCC), a subsidiary, provides clearance and settlement services to U.S. brokers trading in overseas markets. ISCC also promotes the development of global standards for trade processing, reporting, settlement and custody. Emerging Markets Clearing Corporation (EMCC), an affiliate, provides trade matching, clearance and settlement services to global dealers, interdealer brokers and correspondent clearing firms involved in emerging market debt.

In 1998, NSCC processed nearly 947 million transactions, up 46%

Total value of transactions processed was \$44.6 trillion

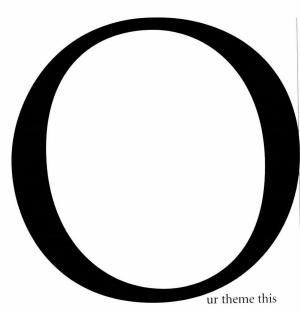
Netting eliminated the need to settle \$42.6 trillion in trading activity

Assets transferred through ACATS were valued at \$254 billion

Volume of mutual fund transactions processed reached almost 38 million, up 34%

Value of mutual fund orders exceeded \$578 billion

#### **Letter To Participants**



year, "A day closer, a decade away," captures the abiding spirit of this organization — and the people who work here — to be ever vigilant in serving the needs of our customers today, while understanding the trends that will shape our role in the future.

Every day, we move a day closer to Year 2000, confident in the steps our industry is taking to ensure the safety, soundness and continuity of financial markets. At the same time, just as we seamlessly moved to T+3 and Same Day Funds, Year 2000 compliance is but a new benchmark for the challenges that lie ahead.

The once-daunting task of clearing and settling unpredictable trading volumes is almost a faded memory, reduced as an industry concern by the seemingly endless capacity to handle whatever

volumes the marketplaces generate. During 1998, we experienced five trading days where volume exceeded 2 billion shares and peak days where NSCC handled as many as 6.7 million transactions. Average daily transaction volumes last year were up 46%, to roughly 3.8 million transactions. By netting the number of transactions requiring financial settlement by as much as 95%, we enable customers to free up capital to be used more efficiently.

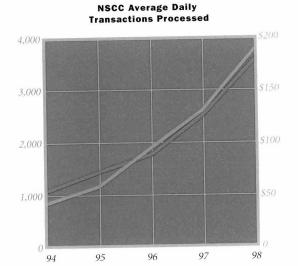
What better news can a management team report than the certainty we have developed, refined and maintained as the nation's leading clearance and settlement organization for markets and broker-to-broker activity. Well, perhaps we should add the steps taken by management and the Board to further reduce certain fees by almost \$20 million in early 1999.

Over the past five years, NSCC reduced fees cumulatively by over \$250 million and provided discounts to customers totalling over \$400 million. All of this was accomplished at the same time we were building new businesses and lowering unit costs.

On Year 2000 compliance, NSCC and SIAC have worked diligently with customers for over two years to prepare for this transition. We've conducted an extensive testing and communications program, including joint seminars with The Depository Trust Company (DTC), a Year 2000 Internet site complete with record layouts, regular newsletter stories and a Year 2000 hotline to answer questions. We've pursued these efforts working closely with our customers, DTC, the SIA and other industry organizations. The success of the industry-wide tests conducted in March/April 1999 are encouraging, and we'll continue our efforts through year-end.

Our new ACATS system, completed late last year and introduced early in 1999, reflects the trend toward product diversification that will continue over the next decade. Instead of simply broker-to-broker transfers, ACATS has been expanded to accommodate banks and new asset categories. It will shorten transfer time

3,758,000



Volume in thousands

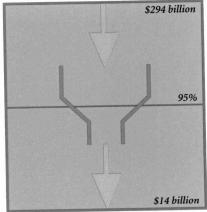
Value in billions of dollars

A peak Volume Day in 1998 compared to NSCC's Daily Average

A Peak Day

September 1, 1998





NSCC reduces or nets the total number of financial obligations requiring settlement

frames, improve the corrections process and offer firms the ability to process transfers several times a day.

During the 1990s, we created the centralized and automated processing required to enhance linkages between manufacturers and their distribution networks. We did this successfully for mutual funds, broker/dealers and banks with Fund/SERV, which in 1998 handled nearly 38 million mutual fund transactions.

We're now focused on providing this same type of centralized processing for insurance carriers, broker/dealers, banks and financial planners who market annuities and life insurance products. Early in 1999, we launched a pilot of our new insurance processing system, which will support the entire life cycle of an annuity, including applications, premiums and financial activity reporting, and builds upon our current support of positions, commissions and valuations.

As some financial organizations consolidate over the next decade, using NSCC may help them avoid having to build their own infrastructure. Some examples of this already exist, where a consolidated financial company uses NSCC's standardized and centralized infrastructure to link its insurance arm with its own broker/dealer distribution network. This unforeseen role, over time, may result in huge savings as the trend toward consolidation continues. It may even suggest a need to rethink how we introduce services during periods of significant organizational change.

The Internet represents the future, and NSCC is embracing this technology to better serve our customers. This past year we took several innovative steps with the launch of PCWeb Direct, our Internet-based transaction entry system. We introduced the use of digital certificates and encryption to safeguard our customers using this service. While PCWeb Direct will initially support six business applications, others will be added in 1999.

Over time, this technology platform opens the door for the delivery of a growing and more diverse range of services at less expense for our members.

During the past five years, the pace of change has accelerated and NSCC enjoyed one of the most productive periods in our history. We've introduced a new bond system (FITS); a new ACATS system; an enhanced version of Fund/SERV; created the New York Window to further reduce the handling of physical

certificates and save the industry millions; converted firms following the exit of Midwest Clearing Corp. and Philadelphia Stock Clearing Corp. from the clearing business; developed the Collateral Management System to give firms a snapshot of their collateral requirements at clearing agencies and depositories; helped manage the industry's transition to T+3 and Same Day Funds; minimized the impact of the Adler Coleman insolvency; launched the Defined Contribution Clearance & Settlement and the Annuity Processing Services, helped establish the Emerging Markets Clearing Corporation and created an affiliate company to support financial planners.

However, if that seemed like an aggressive agenda, it pales in comparison to what lies ahead of us. Competitive pressures on our customers, the exchanges and industry utilities are increasing the pace of change at a rate not envisioned before. This is driven in part by changing markets, technological opportunities, industry consolidation and globalization.

Last summer, management at NSCC and DTC, along with our respective Boards, began talks on the subject of integrating the two entities. NSCC and

National Securities Clearing Role, May National Securines Clearing
In latest SEC Effort to Sto. EMCC Begins Operations NSCC OFFERS ANNUITIES PROCESSING SYSTEM TO INSURANCE INDUSTRY One point of access will allow b NSCC Conducts Y2K Bilateral Tes EM.C will pound the dreat Readies For Industry Beta in Ju

NSC. TO Cleaning Corporation save per web present to your Compliant

SECURITIES INDUSTRY NEWS NSCC Begins Virtual Training On the Web for ACATS

 $m^{(n)}$ 

The National Securities Clearing The National Securities Creating
Corp. has made available on its
Web site free "virtual training" for its Automated Customer Transfer Services system

Acats automates and standardiz Acais automates and standardize of es procedures for the transfer of assets in a customer account from one brokerage firm to another

By signing on to NSCC's Web site www.nscc.com) users can hit the virtual Training" button, which virtual training button, willow leads them to a page containing leads them to a page containing a general overview of the system,

a frequently-asked-questions sec tion, locations and dates for seminars, news articles about Acats and contact information. The site also features password-protect sections, with an Acats training manual and a sample record la out. Users must register w
NSCC to view these section which are also free

NSCC will post virtual train sites for other topics, inclu procedures for mutual funds information on year-2000 cc ance, a NSCC spokesman s



Tuned M. Kell



DTC have been enormously successful over the past 20-plus years in bringing greater efficiency and certainty to the marketplaces. The question we focused on, however, was what about the future?

Over nine months of study and dialogue, we found that integration offered a number of tangible benefits, including the opportunity to harmonize the processing streams for clearance and settlement between the institutional (buy) and broker (sell) sides of the market. It would help us create a centralized infrastructure to provide a single point of access for global products and position us in overseas markets. And we concluded it would move us toward a single, industry-driven strategy that speeds the introduction of new products, services and technology solutions.



Robert J. Woldow

A decision to go forward on integration has been made by the respective Boards of NSCC and DTC, the details of which are being communicated to the industry. Suffice it to say that nothing will interfere with current efforts on Year 2000 or the delivery of critical services to the markets we serve and to our customers. And we will manage this

process with the same customary high standards of quality and reliability that you've come to expect from both NSCC and DTC.

Our goal is to create a new company which builds on the talent at NSCC and DTC. We believe a single, strategically focused effort resulting from this integration will leverage our respective experience and more effectively serve the interests of our customers — and the industry as a whole.

On a personal note: Robert J. Woldow, our valued colleague and friend, passed away suddenly in December. As General Counsel and Secretary, Bob played a key role in a long list of initiatives at NSCC going back to its inception in 1976. He was one of the most respected legal minds around on clearance, settlement and risk management issues. His valued advice and warm sense of humor will be missed. His passing was a great personal loss for us, NSCC — and the entire industry.

In closing, we'd like to thank our Board of Directors for their tireless efforts, valued guidance and ongoing support throughout the year. We are grateful to them and their organizations for the commitment of time and energy they devote to our activities. We also express our gratitude to the talented team at SIAC, who works closely with us in meeting our service commitments.

Finally, we'd like to single out our employees, many of whom you'll meet in the pages that follow. They are the lifeblood of this organization, and their commitment to excellence remains at the core of our success.

Gary F. Goldring
Chairman of the Board

David M. Kelly

President and Chief Executive Officer

# one eye on the present

Inventiveness often comes from a desire to understand and respond to trends shaping the future. In this year's Annual, we've chosen to feature several highly respected futurists to challenge our thinking as we enter the 21st century.

# fone eye on the full telephone of the foliation of the fo

Inventiveness often comes from a desire to understand and respond to trends shaping the future. In this year's Annual, we've chosen to feature several highly respected futurists to challenge our thinking as we enter the 21st century.

# fone eye on the full telephone of the foliation of the fo

Broker/Dealers

Spear Leeds & Kellogg SLK Clearing First Options of Chicago/LIT Troster Singer

Broker/Dealers that own Mutual Funds and/or Banks

The Bear, Stearns Companies, Inc.
Bear, Stearns & Co.
Bear, Stearns Securities Corp.
Bear, Stearns Asset Management
Bear, Stearns Custodial Trust Co.

The Goldman Sachs Group Goldman, Sachs & Co. Goldman, Sachs Mutual Funds Goldman, Sachs Asset Mgmt.

Merrill Lynch
Merrill Lynch Asset Management
Merrill Lynch Trust
Mercury

Morgan Stanley Dean Witter
Morgan Stanley & Co.
Dean Witter
Van Kampen American Capital
Morgan Stanley Dean Witter
Advisors
Discover Brokerage Direct
Morgan Stanley Trust
Dean Witter Trust

Mutual Funds that own Broker/Dealers and Insurance Companies

**FMR Corporation** 

National Financial Services Corp.
Fidelity Brokerage Services, Inc.
Fidelity Capital Markets
National Financial Correspondent
Services
Fidelity Investments Institutional
Services Company, Inc.
Fidelity Investments Life
Insurance Co.
Fidelity Distributors, Inc.

Liberty Financial Companies
Keyport Life
Newport Pacific Management
Stein Roe & Farnham, Inc.
Colonial Mutual Funds
Independence Life & Annuity Co.
Independent Financial Marketing
Group, Inc.
Liberty Asset Management
Company

Banks that Own Broker/Dealers, Mutual Fund Companies and/or Insurance Companies

State Street Corp.
State Street Bank & Trust
State Street Brokerage Services,
Inc.
SSB Investments

State Street Global Advisors

First Union Corporation
First Clearing Corp.
First Union Brokerage Services,
Inc.
First Union Capital Markets
Corp.
Mentor Distributors Inc. –
Mentor Funds
Evergreen Funds
The Money Store

Fleet Financial Group
Quick & Reilly Discount
Brokerage
JJC Specialist Corp.
U.S. Clearing
Galaxy Mutual Funds
Galaxy Annuities

#### CORE SERVICES

#### Automated Customer Account Transfer Service (ACATS)

The Automated Customer Account Transfer Service (ACATS) is a system that automates and standardizes procedures for the transfer of assets in a customer account

from one financial institution to another.

#### Collateral Management Service (CMS)

The Collateral
Management Service (CMS)
provides members with
information on their
own clearing fund and
margin deposits and

requirements at NSCC and at other clearing entities that participate in the service. Members using CMS can determine if they have an excess or deficit at any of the participating clearing entities and access detailed data on their collateral.

#### Continuous Net Settlement (CNS) System

The Continuous Net Settlement (CNS) System is an automated book-entry accounting system that centralizes the settlement of compared security transactions and maintains an orderly flow of security and money balances.

#### Correspondent Clearing Service

Correspondent Clearing Service is a trade-reporting service that processes equity and corporate bond transactions executed by NSCC members (Special Representatives) on behalf of other participants (Correspondents).

# Fixed Income Transaction System (FITS)

The Fixed Income
Transaction System
(FITS) standardizes and
automates the processing
of transactions in municipal
and corporate bonds, and Unit
Investment Trusts.

#### **Fully-Paid-For Account**

The Fully-Paid-For Account is a special sub-account within NSCC's Continuous Net Settlement (CNS) System that assists participants in maintaining compliance with possession and control requirements pursuant to Rule 15c3-3 of the Securities Exchange Act.

#### ID/CNS Interface for Prime Broker Business

The ID/CNS Interface for Prime
Broker Business is a settlement option
that streamlines the processing of
Prime Broker trades. The interface,
which operates between National
Securities Clearing Corporation
(NSCC) and The Depository Trust
Company (DTC), connects NSCC's
Continuous Net Settlement
(CNS) System with DTC's

(CNS) System with DTC's Institutional Delivery (ID) System.

#### **PCWeb Direct**

PCWeb Direct is a PC data-entry and communications package that allows users to directly access NSCC services.

# Reconfirmation and Pricing Service (RECAPS)

Reconfirmation and Pricing Service (RECAPS) is a mandated service for all participants that reconfirms and reprices participants' aged equity, municipal bond, corporate bond, UIT and zero coupon security transactions that have failed previously to settle in NSCC's clearance and settlement system or by other means. Unsettled fails previously compared in RECAPS are required to be submitted with a special indicator.

#### Stock Borrow Program

The Stock Borrow Program allows participants to lend NSCC available stocks and corporate bonds from their account at the Depository Trust Company (DTC) to cover temporary shortfalls in NSCC's Continuous Net Settlement (CNS) System. NSCC credits members' money settlement accounts with the full market value of securities borrowed, and members can earn overnight interest on that value by investing the funds. In addition, members can enhance securities inventory management in a safe, controlled environment through the program.



## Commission Billing for Listed Equities

Commission Billing For Listed
Equities provides an automated
facility for the debiting and crediting
of commissions for NSCC Settling
Members and non-clearing members.
Non-clearing firms, often referred
to as Commission Bill firms, are
specialists and \$2 brokers that trade
on the New York and American
Stock Exchanges, but are not
NSCC members.



Funds Only Settlement Service (FOSS) is a system that centralizes the routing of envelopes that contain money-only charges to full-service participants located in New York City and Jersey City. FOSS is primarily used for debits and credits that result from mark-to-the-market adjustments.

It can also be used for other moneyonly charges.



## Dividend Settlement Service (DSS)

Dividend Settlement Service (DSS) is a centralized claims-processing system that manages the collection of dividends and interest owed to participants by other financial institutions. DSS enables users to claim funds due them by charging other DSS participants through NSCC's clearance and settlement system. Money settlement normally occurs within five business days.

# Envelope Settlement Service (ESS)

Envelope Settlement Service (ESS) standardizes and controls participant-to-participant physical delivery of securities in New York City and Jersey City. Intercity Envelope Settlement Service (IESS) standardizes and controls participant-to-participant physical delivery of securities between New York and NSCC branch cities.

#### MUTUAL FUND SERVICES

#### Fund/SERV

Fund/SERV has become the industry standard for automated, centralized processing of mutual fund purchase and redemption orders, settlement, and account registration. The system reduces the time and cost of processing transactions, and increases efficiency.



The mix of customers NSCC supports is changing rapidly, driven in part by consolidation, market opportunities and new technology. We've identified some of these customers to illustrate the growing diversity and complexity of financial organizations we serve.

# Serve

Insurance Companies that Own
Mutual Funds, Broker/Dealers
and/or Banks
Lincoln Financial Group
Lincoln National
Delaware Management
Holdings
Lynch & Mayer
Vantage Global Advisors

#### **AXA**

Equitable Companies, Inc.
Equitable Life Assurance
Society of U.S.
Equitable Distributors, Inc.
Alliance Capital
Donaldson, Lufkin & Jenrette
Pershing

SunLife Assurance Company
of Canada
Sun Life of Canada
Sun Life Insurance and
Annuity Company of
New York
New London Trust FSB
MFS Investment Management
Sun Capital Advisers
Sun Life of Canada (U.S.)
Distributors

#### AIG

SunAmerica
CalAmerica Life
SunAmerica National Life
SunAmerica Securities
Sentra Spelman
SunAmerica Asset
Management Group
Resources Trust Co.

#### Financial Conglomerates Citigroup

Salomon Smith Barney
Citibank Securities
Travelers Insurance
Travelers Life Annuity
Citibank
Primerica Financial Services

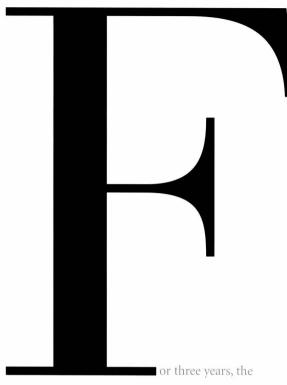
#### Bank of America

BankAmerica Corp.
NationsBank Corporation
NationsBanc Montgomery
Securities LLC
Fleetwood Credit Corp.
NationsBanc Investments,
Inc.
TradeStreet Investment
Associates

#### **Fisery**

IPS Sendero GTE ATM Networks BHC Securities Fiserv Correspondent Services, Inc.

#### Core Services



entire securities industry has been inching a day closer to the millennium, employing vast resources to ensure firms and customers experience a seamless systems transition to the Year 2000.

Staying focused and following a rigorous timetable of testing, applications modifications and disaster recovery planning has been the "order of the day" at NSCC for quite some time. And while it has been only one of a host of major projects undertaken in 1998, this interaction among so many market players will no doubt be recorded as the most intense in the last 50 years.

NSCC completed coding work on all critical applications in 1998, so that we could direct our resources at the Y2K needs of our customers. We conducted an extensive communication effort, including seminars, and established a Year 2000 web site to offer customers access to record layouts and other important information.

The testing stage for NSCC began in earnest with bilateral tests involving marketplaces, exchanges and other utilities last July. NSCC and 28 other firms participated in the first industry beta test, a four-day

dress rehearsal, sponsored by the Securities Industry Association, that simulated trading from the time an order is entered in 1999 until the trade is settled in 2000. Following this industry-wide test, NSCC conducted point-to-point testing through the fall, to assess the ability to send and receive files in Year 2000-compliant formats. NSCC also successfully participated in the second industry-wide test conducted in March/April 1999.

Development of a foolproof plan on Year 2000 has involved close coordination and an active dialogue with DTC, the Securities and Exchange Commission, the SIA, the Securities Industry Automation Corporation and our owners, the NYSE, AMEX and NASD, as well as regional exchanges and other utilities.

During 1999, NSCC will continue to focus on completing Year 2000 contingency plans for every financial instrument we support, and that will involve every department, both line and staff, of our organization. Essentially, we are leaving nothing to chance.

Anticipating trends almost a decade away is a cornerstone of our success, and nowhere is that more evident than in our capacity planning for the clearance and settlement of equities, bonds and mutual fund transactions.

In the last two years, the average number of daily transactions processed by NSCC has nearly doubled to 3.8 million. In 1998, the average number of shares per transaction was 1,327.

Where a billion-share trading day in all marketplaces used to be unusual, it is now the rule. In 1998, NSCC handled five trading days with volume of or in excess of 2 billion shares. And whether it's the market correction in October 1987 or NSCC's highest volume day ever of 6.7 million transactions on September 1, 1998, we're constantly vigilant to ensure adequate post-trade processing capacity.

Not only has NSCC created certainty in handling unpredictable spikes in trading volume, but through trade netting it has significantly reduced risk and enhanced capital efficiency for member firms. Of the nearly \$45 trillion in transactions entering our Continuous Net Settlement System in 1998, NSCC reduced or netted down the number of obligations requiring settlement by about 94%. For the layman, this means over \$42 trillion in payments did not have to change hands.

#### Networking

Networking is the industry standard for mutual fund customer account maintenance and reporting. The automated recordkeeping system allows non-trade related client information to appear identically on the records of the firm and the fund or its transfer agent. With Networking, firms and funds can exchange timely, accurate information about their customers in a controlled environment.

#### Commission Settlement and Global Update Service

Commission Settlement and Global Update Service is an automated system that facilitates the exchange of mutual fund commission-related information between financial services organizations and funds, and centralizes commission payments into NSCC's settlement system. The service also allows firms to provide mutual funds with global and individual update information that affects single as well as multiple accounts, e.g., when there is a change in branch address, branch number, or account executive information.

# Offer:

#### ACATS-Fund/SERV Interface

The ACATS-Fund/SERV Interface is a system that links NSCC's Automated Customer Account Transfer Service

system. The ACATS-Fund/SERV Interface allows mutual funds to electronically update their account registrations when a customer account is transferred

from one broker to another.



# Defined Contribution Clearance & Settlement (DCC&S)

Defined Contribution Clearance & Settlement (DCC&S) standardizes, centralizes and automates the processing of defined contribution mutual fund transactions, utilizing the capabilities of NSCC's existing Fund/SERV, Networking and Mutual Fund Profile systems. DCC&S reduces the time, costs and risks associated with defined contribution mutual fund transactions.

# Mutual Fund Profile Service (MFPS)

The Mutual Fund Profile Service (MFPS) is an automated, centralized system that has been created to improve the flow of information among NSCC's participants in the mutual fund industry and to enable them to exchange accurate and timely information on daily prices and dividend rates; firm and fund members; individual security identifications; processing capabilities, and projected and actual distribution declarations.

## Transfer of Retirement Assets Service (TORA)

Transfer of Retirement Assets Service (ToRA) is part of the Fund/SERV system and enables two mutual fund companies to initiate, acknowledge, confirm and settle the transfer of the value of mutual fund shares held in Individual Retirement Accounts (IRAs) in a centralized, standardized and automated fashion.

#### Underwritings & Tender Offers

The Underwritings & Tender Offers feature of NSCC's Fund/SERV system automates the process by which investment companies offer new funds, initial public offerings (IPOs) and underwritings. The service also streamlines the tender offer process by which mutual funds redeem shares during specified periods. By using the Underwritings & Tender Offers capability, brokers and funds can save time and money by processing largevolume transactions via a centralized, automated system. In addition, the feature allows orders to be processed over an extended period of time.

#### INSURANCE SERVICES

#### Insurance Processing Services (IPS)

NSCC's Insurance Processing Services (IPS) for life insurance and annuity products automate and centralize the processing and electronic communications linking insurance carriers with broker/dealers, banks and/or their affiliated insurance agencies. IPS will support the full range of processing activities that take place between carriers and distributors during the life of a life insurance or annuity contract. These include the transmission of information relating to annuity applications, contracts, premiums and commissions, position/valuation information and related money settlement.

#### INTERNATIONAL SERVICES

# Foreign Securities Comparison and Netting (FSCN) System

The Foreign Securities

Comparison and Netting

(FSCN) System automates
the comparison and netting of non-U.S. equity
transactions executed
by members of NSCC.

Developed by NSCC
in conjunction with
its wholly owned subsidiary
rnational Securities Clearing

International Securities Clearing Corporation (ISCC), FSCN allows non-U.S. equity transactions to be processed in NSCC's Over-

The-Counter (OTC)
Comparison

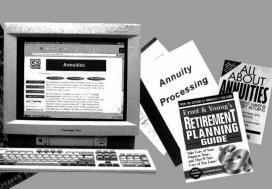
System.

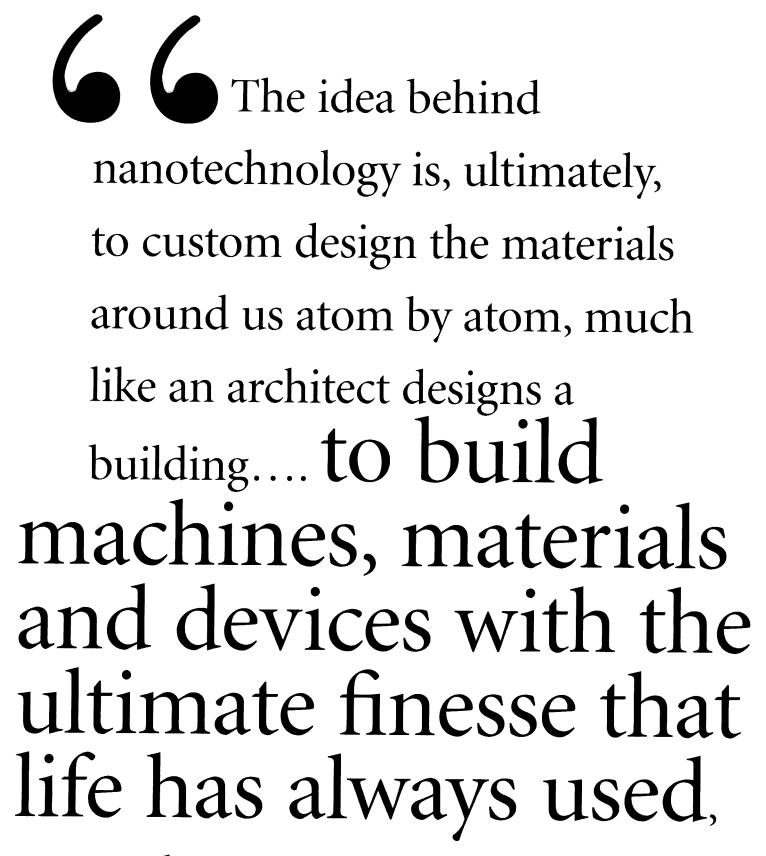
#### Global Clearing Network (GCN)

Global Clearing Network (GCN) is a service that clears and settles cross-border trades through a central point. Launched in 1992, GCN enables firms to move quickly into markets, to issue instructions and receive reports in a consistent format, and to lower transaction costs based on the collective volume of the network participants.

## The Emerging Markets Clearing Corporation

The Emerging Markets Clearing Corporation (EMCC) provides trade matching, clearance, settlement and risk management services to global dealers, interdealer brokers and correspondent clearing firms involved in emerging markets debt instruments. Established in 1997, EMCC is owned by firms active in this market and is a U.S. registered clearing agency. The International Securities Clearing Corporation (ISCC), a wholly owned subsidiary of NSCC, acts as facilities manager.





on the same scale as the machinery

in living cells.

Dr. Richard Smalley, Ph.D. Professor of Chemistry, Rice University ..... winner of the 1996 Nobel Prize for Chemistry