

**An outline of this talk and
the images are posted at**

www.edwardothorp.com

**along with publications
presenting the math and
other details.**



American style double zero roulette wheel.
Photo courtesy www.abbiati.it





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C      EDWARD THORP  PROB K837  PROG NO 679
C      MAIN ROUTINE TWO  ARE SSETS  DLR SOFT 17
11     FORMAT(8F9.4)
13     FORMAT(10F5.0)
20     FORMAT(10F11.5)
21     FORMAT(12F5)
22     FORMAT(F11.5/2F11.5/3F11.5/4F11.5/5F11.5/6F11.5/7F11.5/8F11.5/9F1
11.5/10F11.5)
      DIMENSION Q(10),PR(22),PRU(22),PU(22),PUI(22),ES(21),ED(21),DE(20)
      DIMENSION K(15),PJS(22),PJSU(22),EDS(21),DES(21)
      DIMENSION CHK(10,10),EDD(10,10),DD(10,10),ESP(10),SP(10)
      DIMENSION PRN(22),EP(10,10),E(10,10),EVR(10)
      READ 81,LIH
      READ 81,NBR
12     READ 13,IC(1),I=1,10)
      ACES=Q(1)
      AMT=0.
      DO 14 I=1,10
14     AMT=AMT+Q(I)
      K(1)=10
      M=K(1)
20     Q(M)=Q(M)-1.
      PRBJ=0.
      DO 24 I=1,22
24     PR(I)=0.
      PRB=1.
      ISUM=K(1)
      L=2
28     K(L)=10
      M=K(L)
29     AL=L
      PRB=PRB*Q(M)/(AMT+1.-AL)
      Q(M)=Q(M)-1.
      ISUM=ISUM+K(L)
      IF (ISUM-17)36,34,34
34     ITOT=ISUM
      GO TO 41
36     IF (Q(1)-ACES)39,37,74
37     IF (L-LIH)38,46,74
38     L=L+1
      GO TO 28
39     IF ((11-ISUM)*11ISUM-8)127,40,40
40     ITOT=ISUM+10
41     IF (ITOT-21)49,44,42
42     PR(22)=PR(22)+PRB
      GO TO 50
44     IF (L-2174.47,45
45     PR(21)=PR(21)+PRB
      GO TO 50
47     PRBJ=PRBJ+PRB
      GO TO 50
48     ITOT=ISUM
49     PR(ITOT)=PR(ITOT)+PRB
50     Q(M)=Q(M)+1.
      PRB=PRB*(AMT+1.-AL)/Q(M)
      ISUM=ISUM-K(L)
53     IF (K(L)-1174.56,54
54     K(L)=K(L)-1
      M=K(L)

```

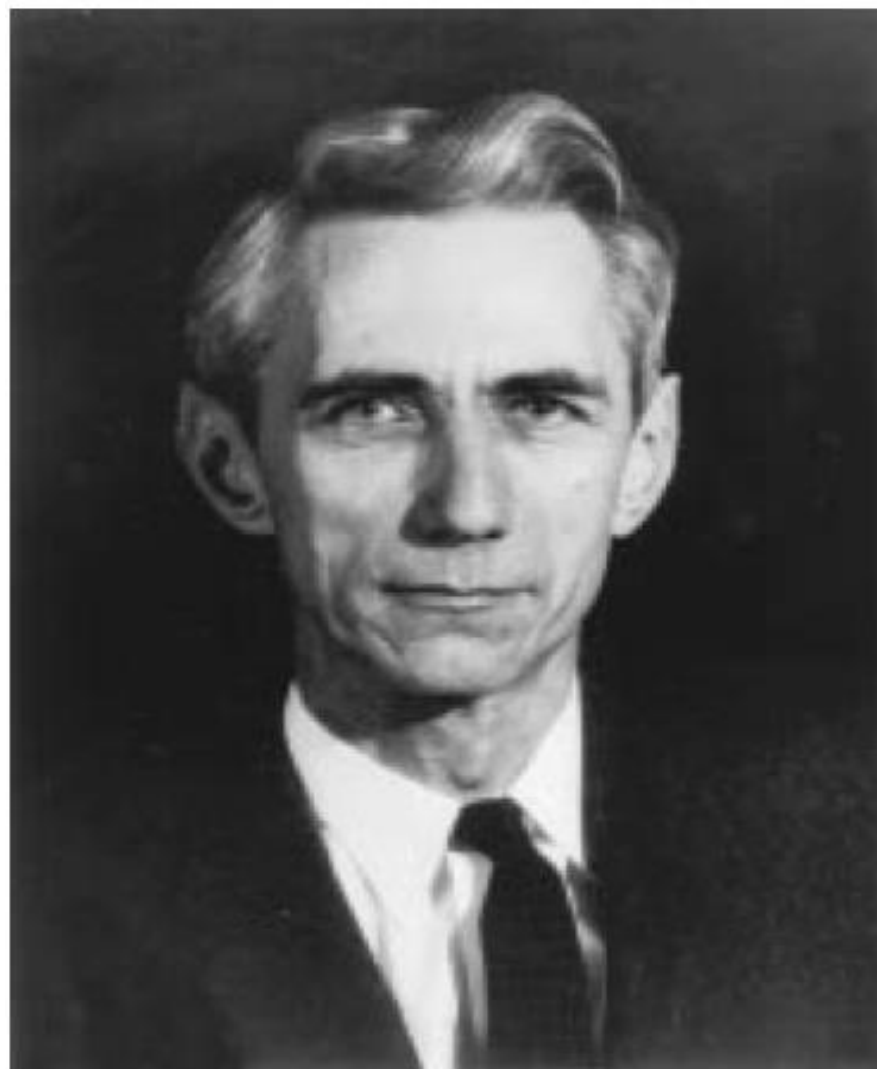


Photo by L. Zadeh

Claude Elwood Shannon
The founder of Information Theory



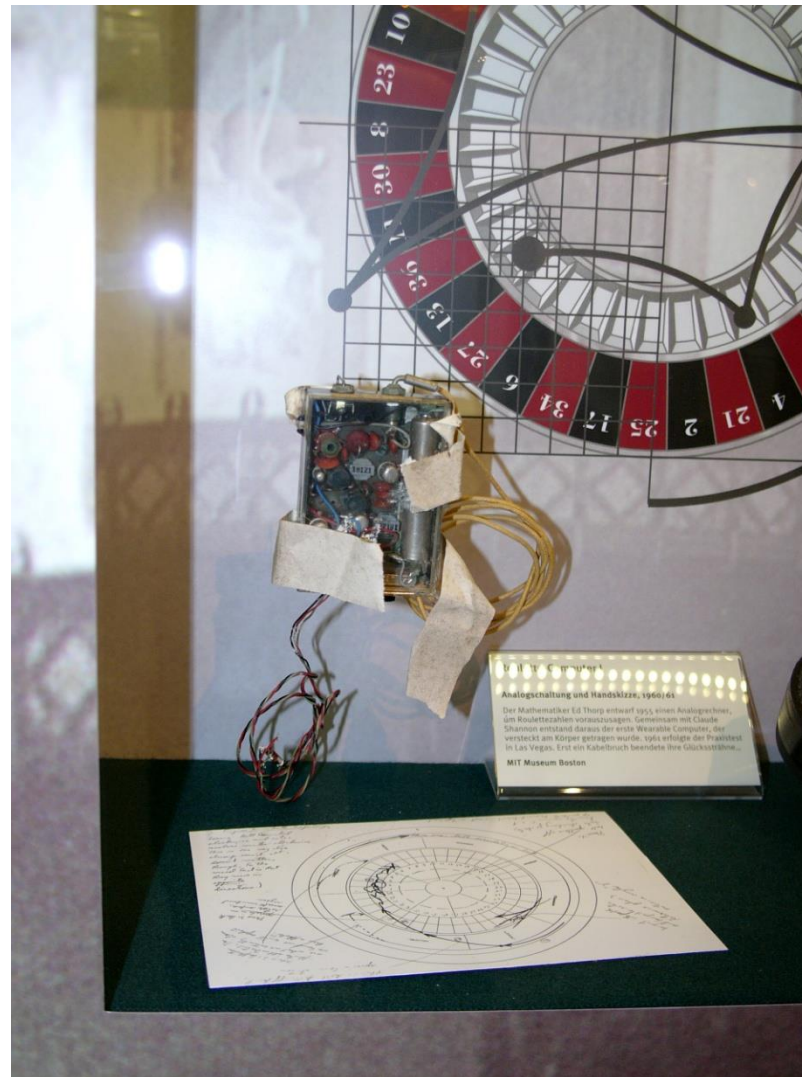
Claude Shannon playing chess with Russian World Champion M. Botvinnik.

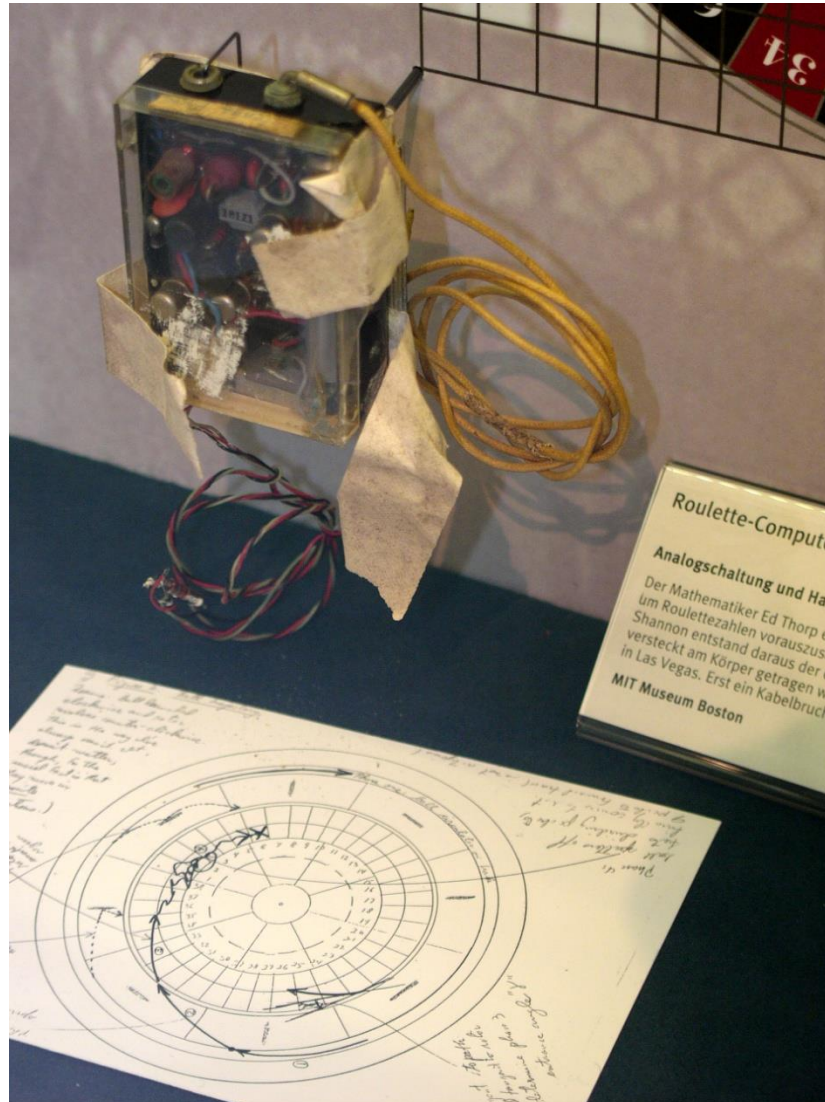
*From My Life and Travels with the Father of Fuzzy
Logic by Fay Zadeh, Photo ©1998 TSI Press,
Albuquerque, NM USA*

Nixdorf Museum Roulette Wheel



Nixdorf Museum wheel layout with wearable computer





Roulette-Computer

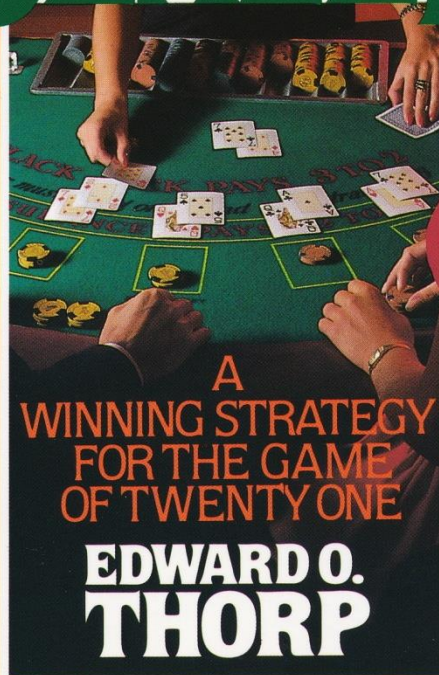
Analogschaltung und Hand

Der Mathematiker Ed Thorp ent-
wickelte um Roulettezahlen vorauszusagen
Shannon entstand daraus der er-
ste versteckt am Körper getragene
in Las Vegas. Erst ein Kabelbruch

MIT Museum Boston

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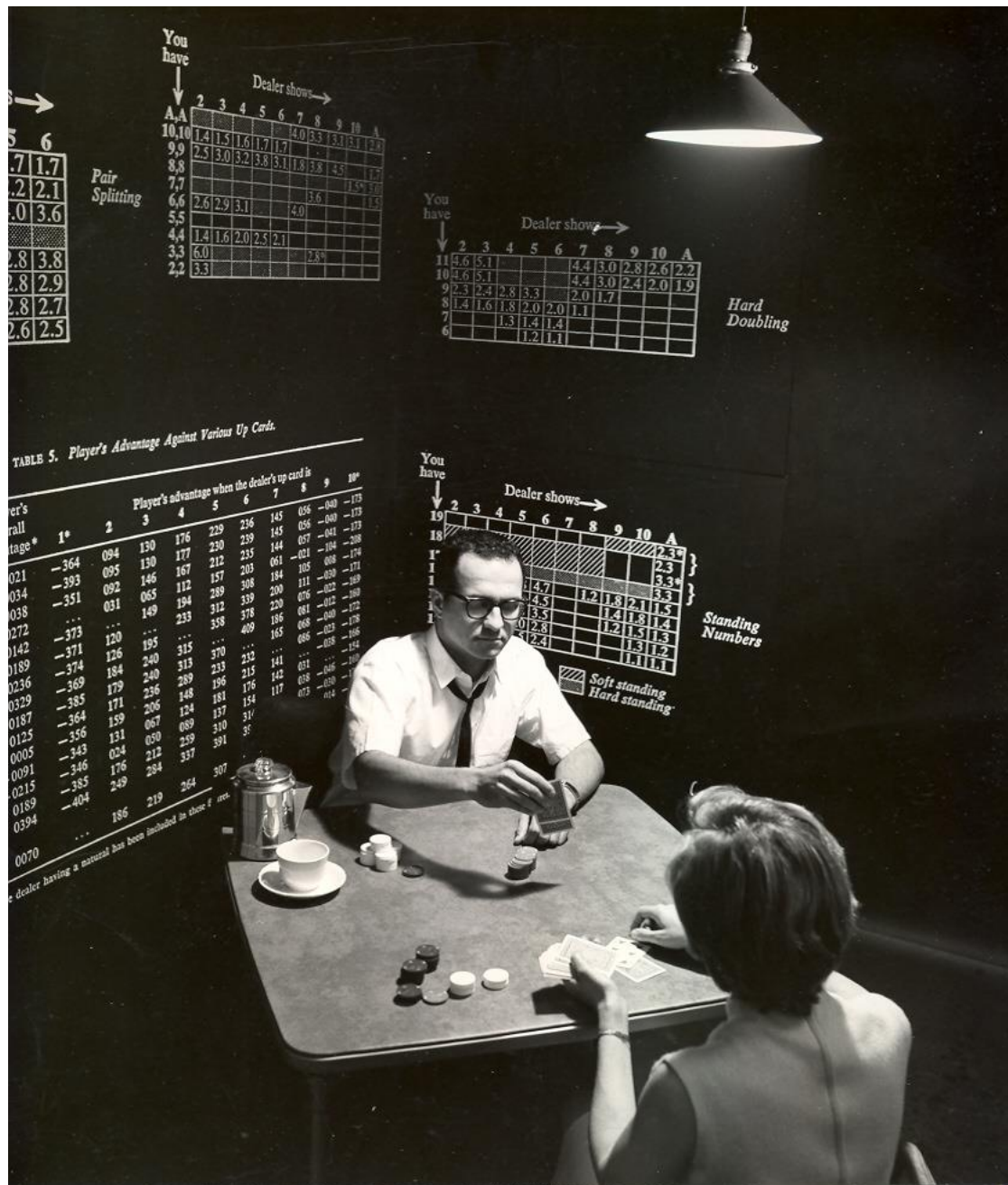


TABLE 5. Player's Advantage Against Various Up Cards.

Player's Total Advantage*	Player's advantage when the dealer's up card is									
	1*	2	3	4	5	6	7	8	9	10*
0021	-364	084	130	176	229	236	145	056	-040	-173
0034	-393	095	130	177	230	239	145	056	-040	-173
0038	-351	092	146	167	212	235	144	057	-041	-173
0272	...	...	065	112	157	201	061	-021	-104	-208
0142	-373	120	...	233	289	308	184	105	008	-174
0189	-371	126	195	...	312	339	220	076	-022	-169
0236	-374	184	240	313	358	378	220	081	-012	-172
0329	-369	179	236	289	358	378	220	081	-012	-172
0187	-385	171	236	289	358	378	220	081	-012	-172
0125	-364	159	206	148	...	...	...	...	...	...
0005	-343	131	050	212	259	310	310	310	310	310
0091	-346	176	284	...	...	...	...	...	...	...
0215	-385	249	...	...	...	...	...	...	...	...
0189	-404	...	...	...	...	...	...	...	...	...
0394	...	186	219	264	307	...	...	...	...	...
0070	...	...	...	...	...	...	...	...	...	...

* dealer having a natural has been included in these figures.

→

5	6
7	1.7
2	2.1
0	3.6
8	3.8
8	2.9
8	2.7
2	2.5

Pair
Splitting

You have ↓

Dealer shows →

A	A	2	3	4	5	6	7	8	9	10	A
10	10	1.4	1.5	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7
9	9	2.5	3.0	3.2	3.8	3.1	1.8	3.8	4.5	1.7	1.7
8	8	2.6	2.9	3.1	...	4.0	...	...	1.5	1.5	1.5
7	7	...	...	...	...	...	...	...	...	...	...
6	6	...	...	...	...	...	...	...	...	...	...
5	5	...	...	...	...	...	...	...	...	...	...
4	4	...	...	...	...	...	...	...	...	...	...
3	3	...	...	...	...	...	...	...	...	...	...
2	2	...	...	...	...	...	...	...	...	...	...

You have ↓

Dealer shows →

11	4.6	5.1	...	...	...	...	...	...	...	...	...
10	4.6	5.1	...	...	...	...	...	...	...	...	...
9	2.3	2.4	2.8	3.3	...	...	...	...	...	...	...
8	1.4	1.6	1.8	2.0	2.0	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...

Hard
Doubling

You have ↓

Dealer shows →

19	2	3	4	5	6	7	8	9	10	A
18	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...
1	...	...	...	...	...	...	...	...	...	...

Standing
Numbers

Soft standing
Hard standing

Warrant diagram

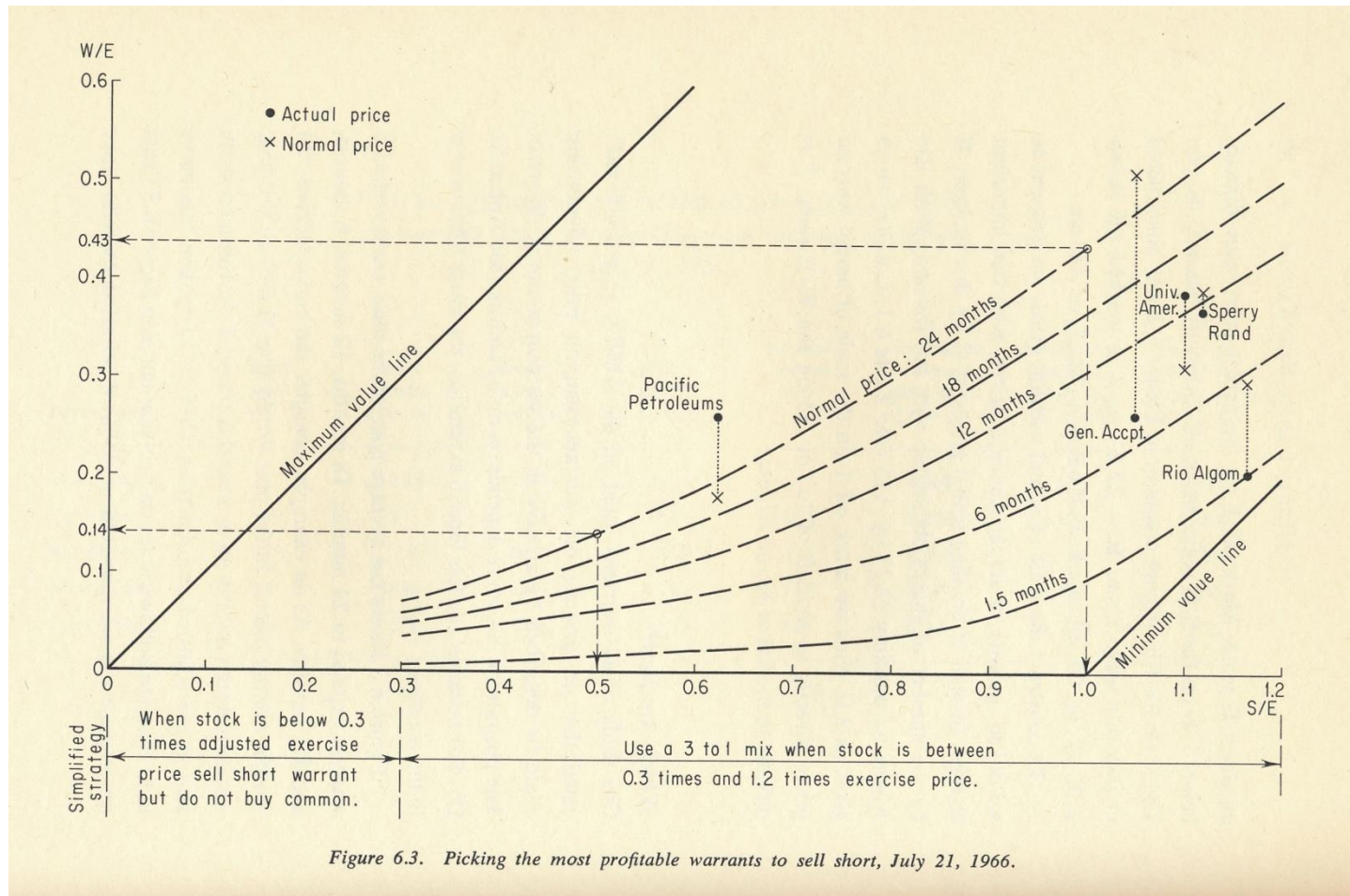
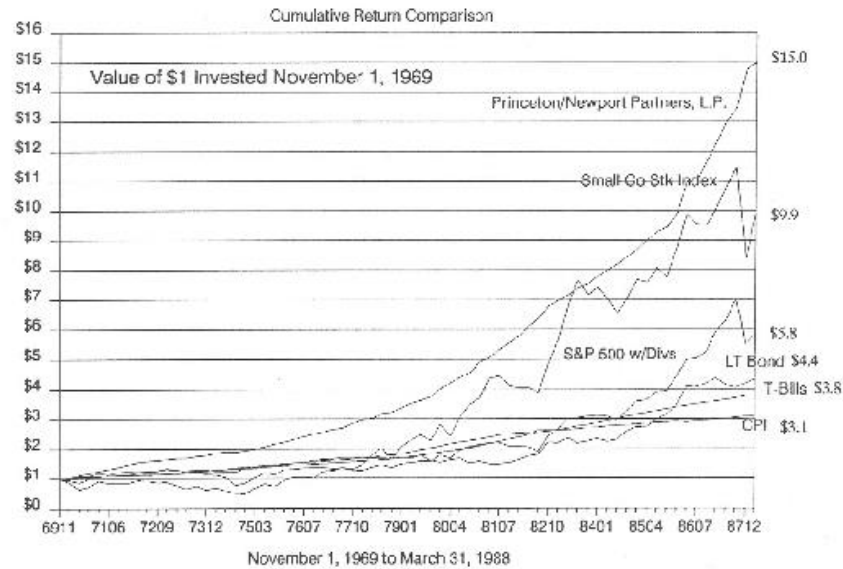


Figure 6.3. Picking the most profitable warrants to sell short, July 21, 1966.

Figure 2

Princeton Newport Partners, L.P.



COMPOUND ANNUAL RETURN AND STANDARD DEVIATION

	Return	STD.
Princeton Newport Partners, L.P.:	15.8%	4.3%
Small Company Stock Index:	13.3%	27.4%
S&P 500 with Dividend Adjustment:	10.1%	17.3%
Long Term Government Bond Total Return:	8.3%	10.7%
U.S. Treasury Bill Total Return:	7.6%	1.5%
U.S. Consumer Price Index:	6.4%	2.0%

XYZ Performance Comparison I



THE QUANTS

SCOTT PATTERSON



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THE CASINOS AND WALL STREET

William Poundstone

1st

2nd 12

3rd 12

2 to 1

2 to 1

2 to 1

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