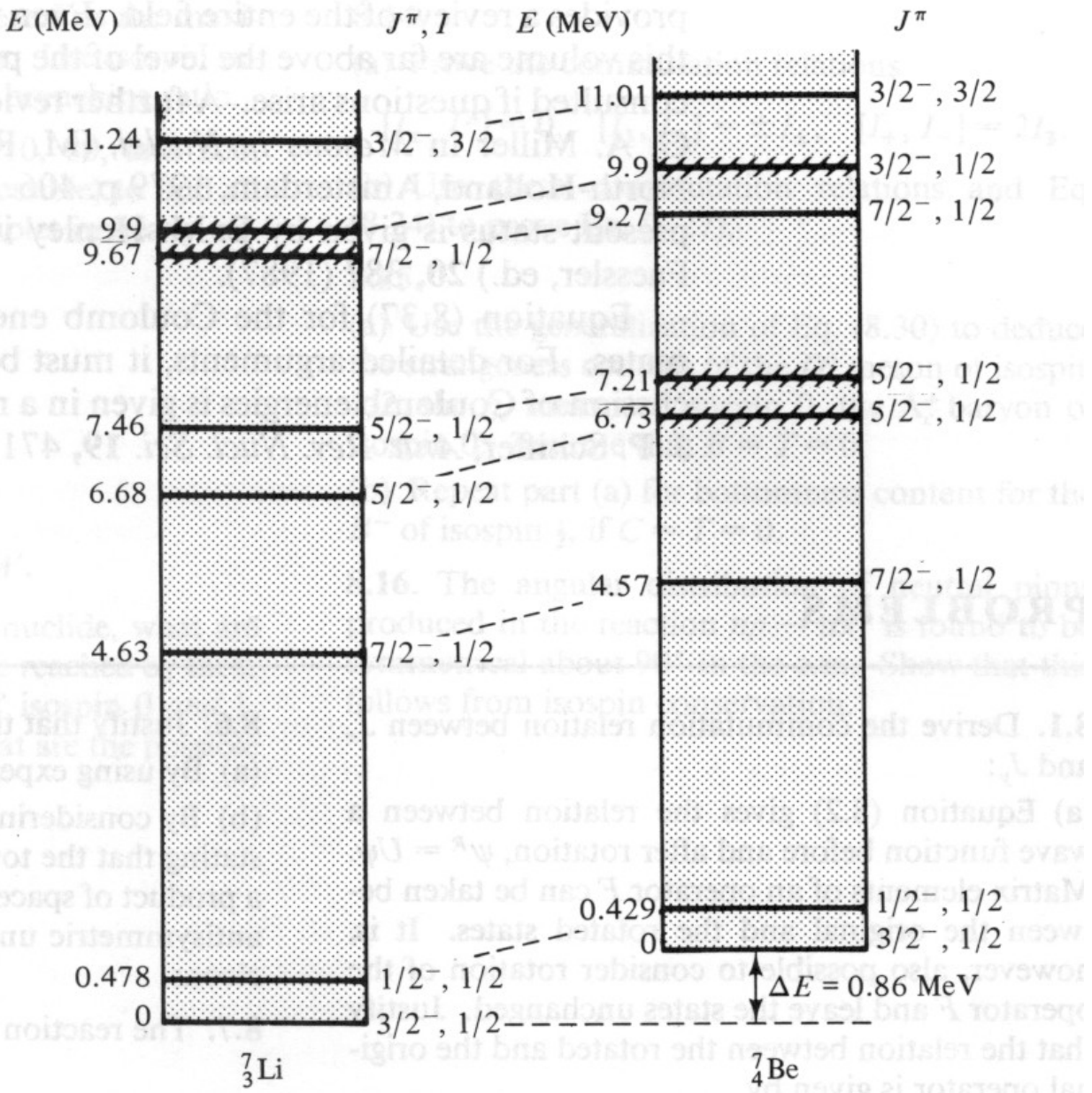


Fig. 8.6. Level structure in the two isobars ^{7}Li and ^{7}Be. These two nuclides contain the same number of nucleons; apart from electromagnetic effect, their level schemes should be identical. J^π denotes spin and parity of a level, I its isospin. Parity will be discussed in Chapter 9. [For reference see F. Ajzenberg-Selove, *Nucl. Phys.* **A490,** 1 (1988).]

Fig. 4-1

$$E_{IA}(Z+1) = E_{IA}(Z) + \Delta E_c - (m_n - m_H)c^2, \qquad (10\text{-}8)$$

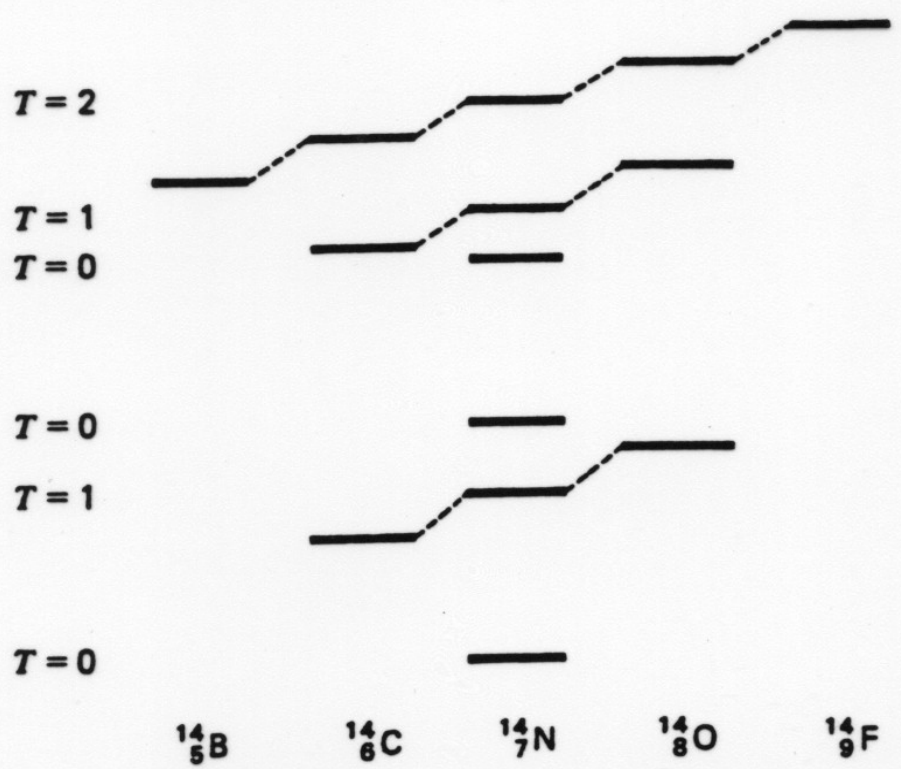
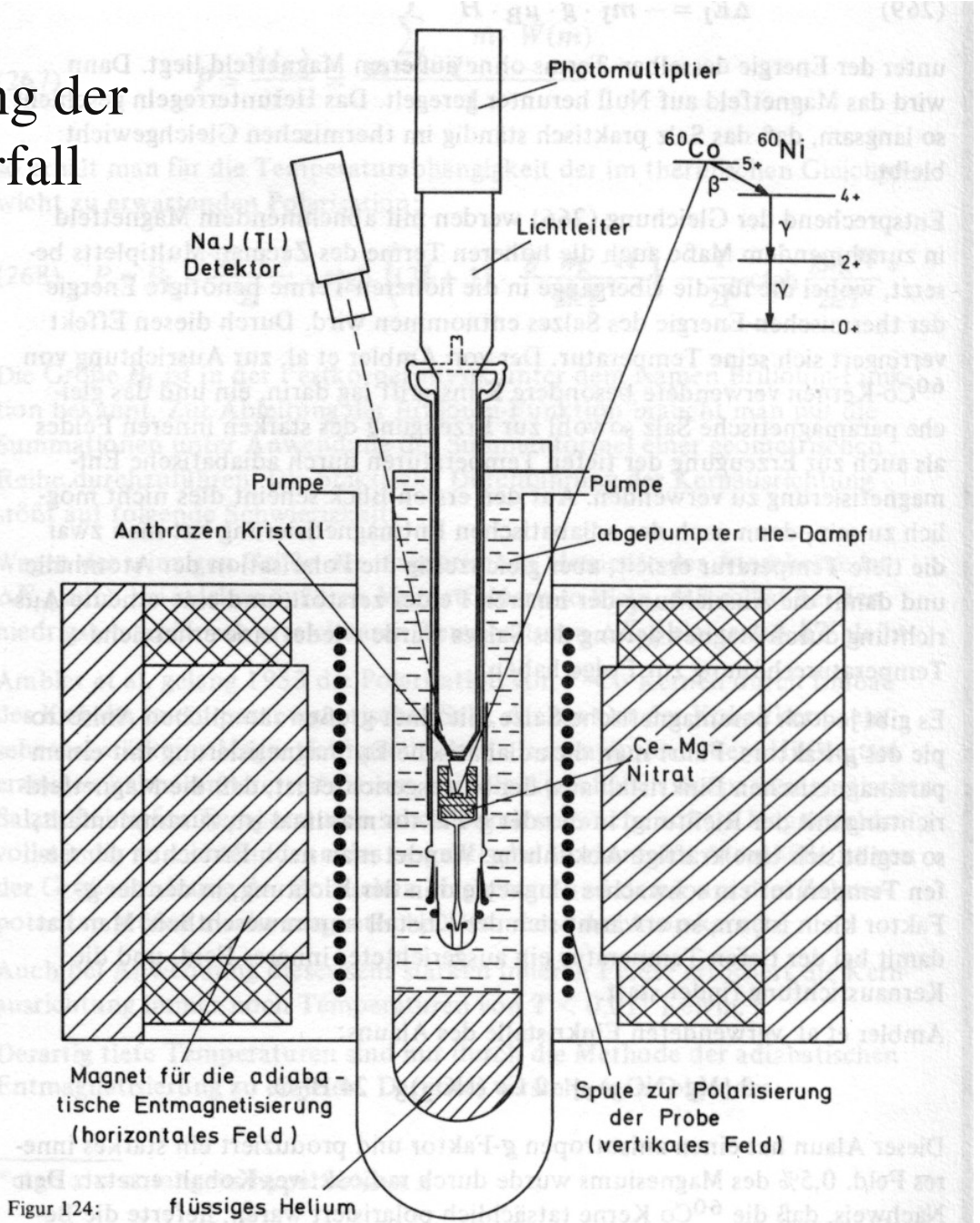


Fig. 10-2 Isobaric analog states in $A = 14$ nuclei. States are classified according to the T quantum numbers. [Adapted from *Concepts of Nuclear Physics* by B. L. Cohen. Copyright © 1971 by McGraw Hill, Inc. Used with the permission of McGraw Hill Book Company.]

$T_{min} = T_z =$	2	1	0	1	2
$T_{max} =$	7	7	7	7	7

Fig. 4-2

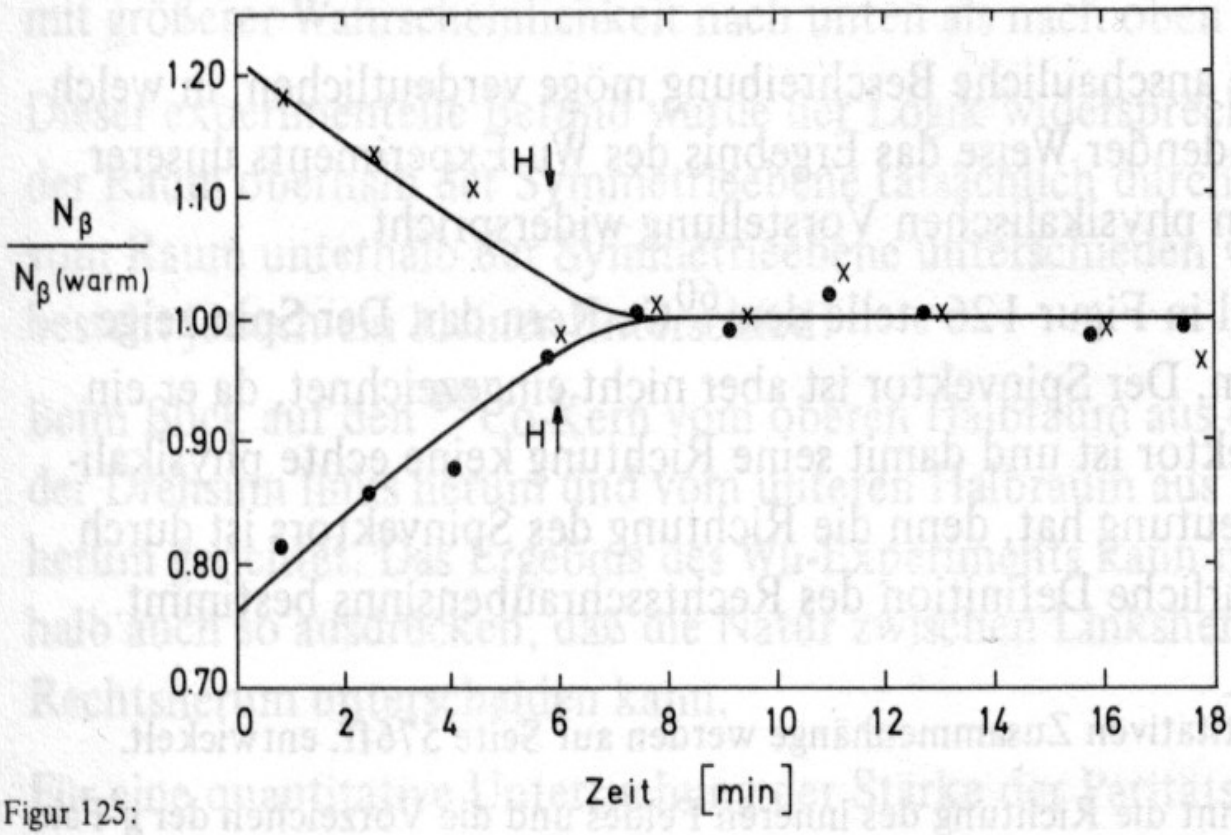
Wu Experiment zur Entdeckung der Paritätsverletzung im Beta-Zerfall



Figur 124:

Anordnung von Wu et al., Phys.Rev. 105, 1413 (1957) zur Beobachtung der Paritätsverletzung beim Beta-Zerfall.

Fig. 4-3



Figur 125:

Beobachtete Beta-Zählrate als Funktion der Zeit in der Anordnung der Figur 111. Diese Meßkurve ist der Arbeit von Wu et al., Phys.Rev. 105, 1413 (1957) entnommen.

Fig. 4-4

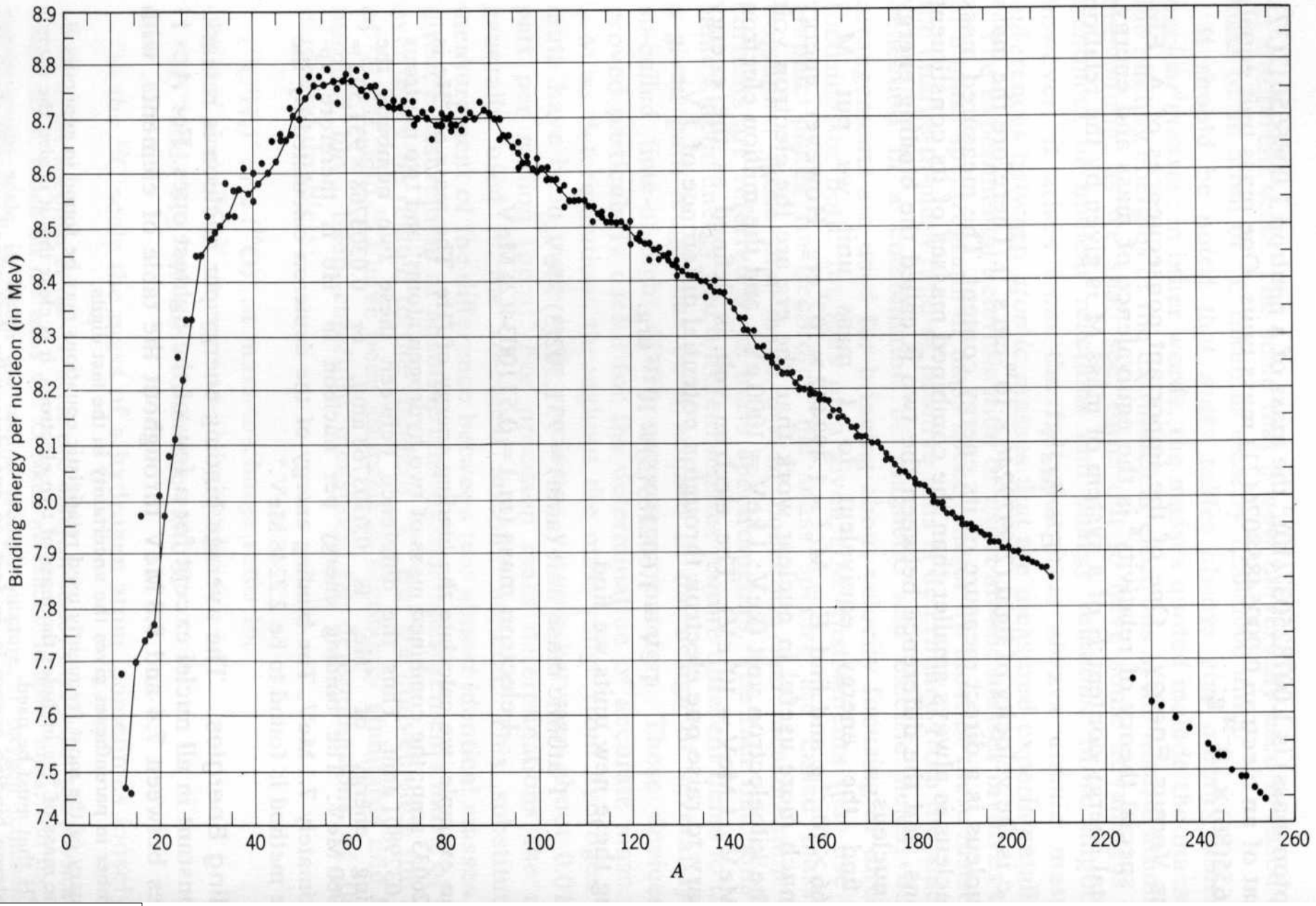

Binding energy per nucleon (in MeV)
8.9
8.8
8.7
8.6
8.5
8.4
8.3
8.2
8.1
8.0
7.9
7.8
7.7
7.6
7.5
7.4
0
20
40
60
80
100
120
140
160
180
200
220
240
260
A

Fig. 5-1

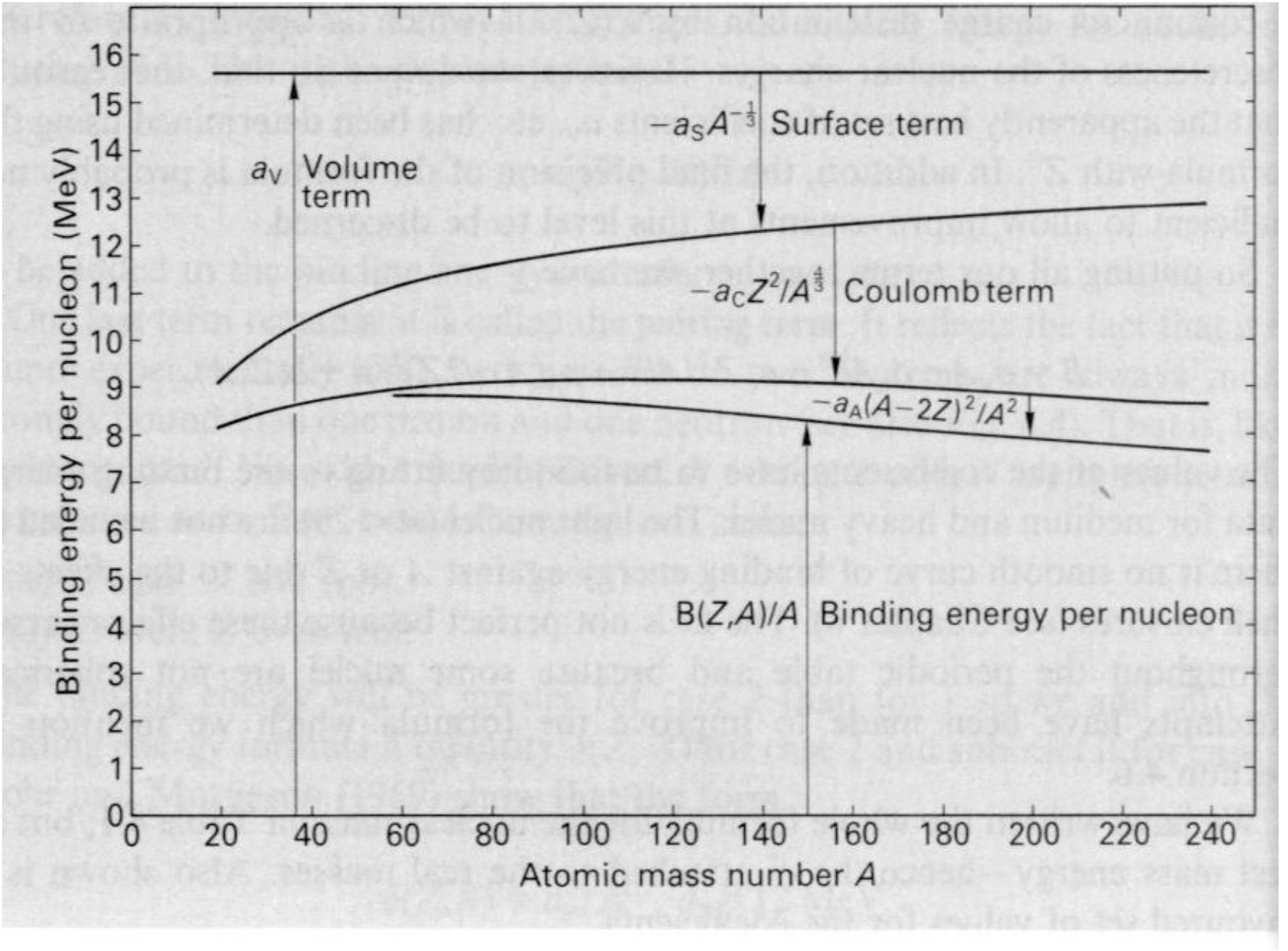

Binding energy per nucleon (MeV)
Atomic mass number A
a_V Volume term
$-a_S A^{-\frac{1}{3}}$ Surface term
$-a_C Z^2/A^{\frac{1}{3}}$ Coulomb term
$-a_A(A-2Z)^2/A^2$
$B(Z,A)/A$ Binding energy per nucleon

Fig. 5-2

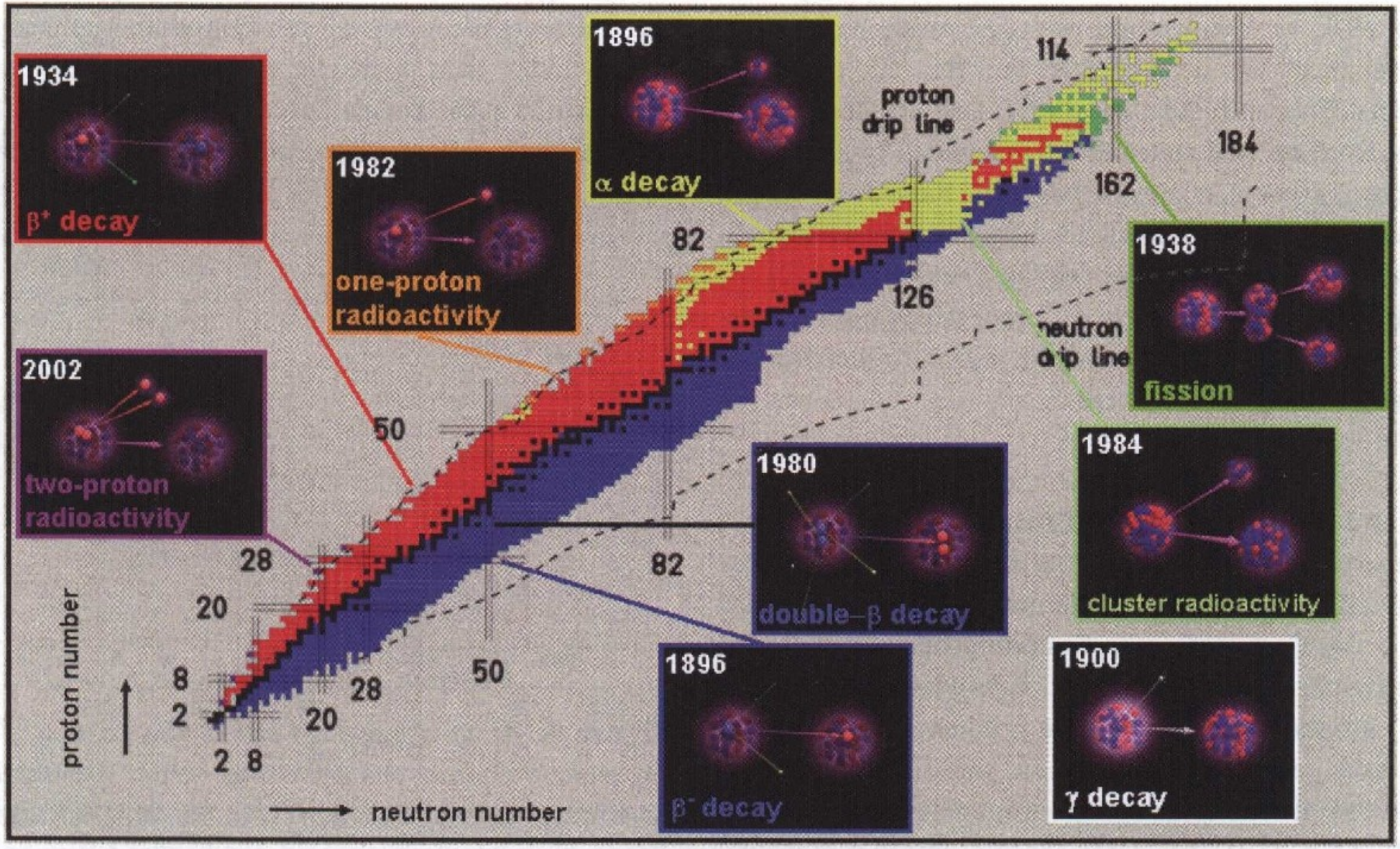

1934
β+ decay
1982
one-proton
radioactivity
1896
α decay
114
proton
drip line
184
162
82
126
neutron
drip line
1938
fission
2002
two-proton
radioactivity
50
28
20
8
2
2 8
20
28
50
82
1980
double–β decay
1984
cluster radioactivity
1896
β- decay
1900
γ decay
proton number
neutron number

Fig. 5-2a

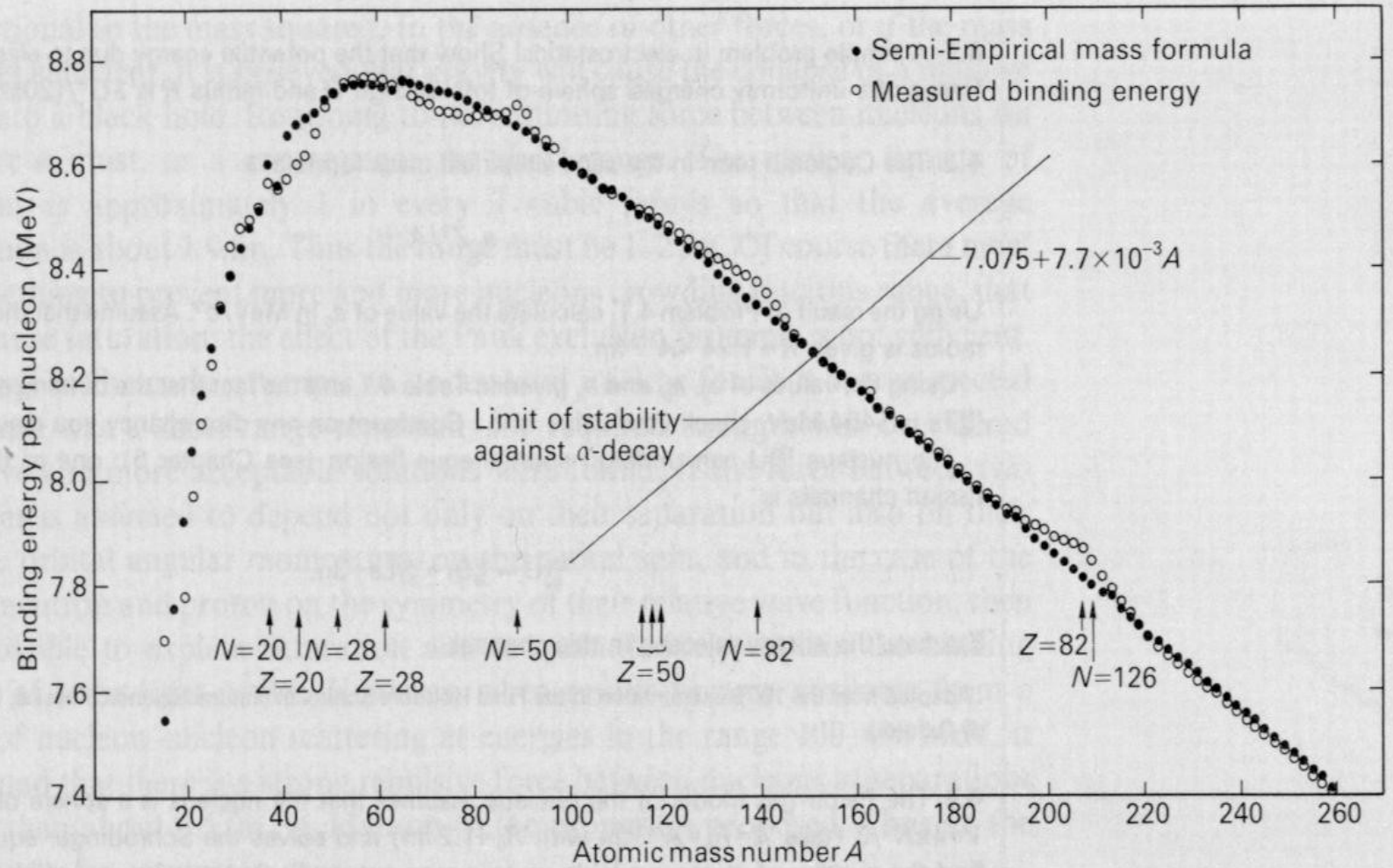


Fig. 4.6 The binding energy as a function of A for the odd-A nuclei from $A = 15$–259. The solid points are the prediction of the semi-empirical mass formula as given in Table 4.1. The open points are the measured values. The points for the formula do not lie on a smooth curve because Z for these nuclei is not a smooth function of A (see Fig. 4.1). Note that the zero of the ordinate is suppressed and its scale is much enlarged. Thus, in spite of the deviations from the formula, it is clear that the formula predicts the binding energy per nucleon for $A > 20$ with a precision which is, for the majority of cases, better than 0.1 MeV. The straight line crossing the curve at $A = 151$ gives the limit of stability of nuclei to α-decay (see Section 5.4).

Fig. 5-3

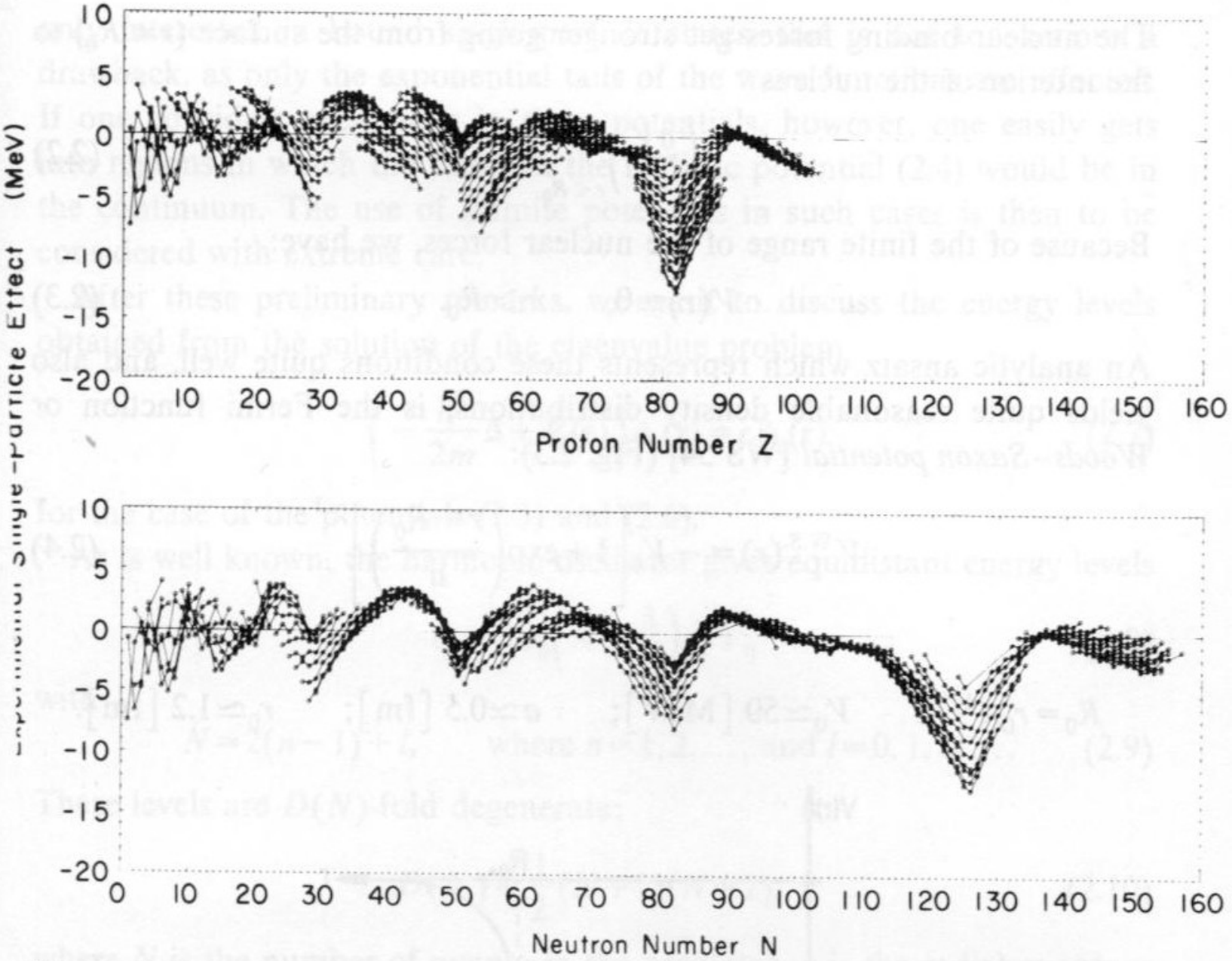


Figure 2.2. Deviations of nuclear masses from their mean values plotted as a function of neutron and proton number. (From [MS 66].)

Fig. 5-4

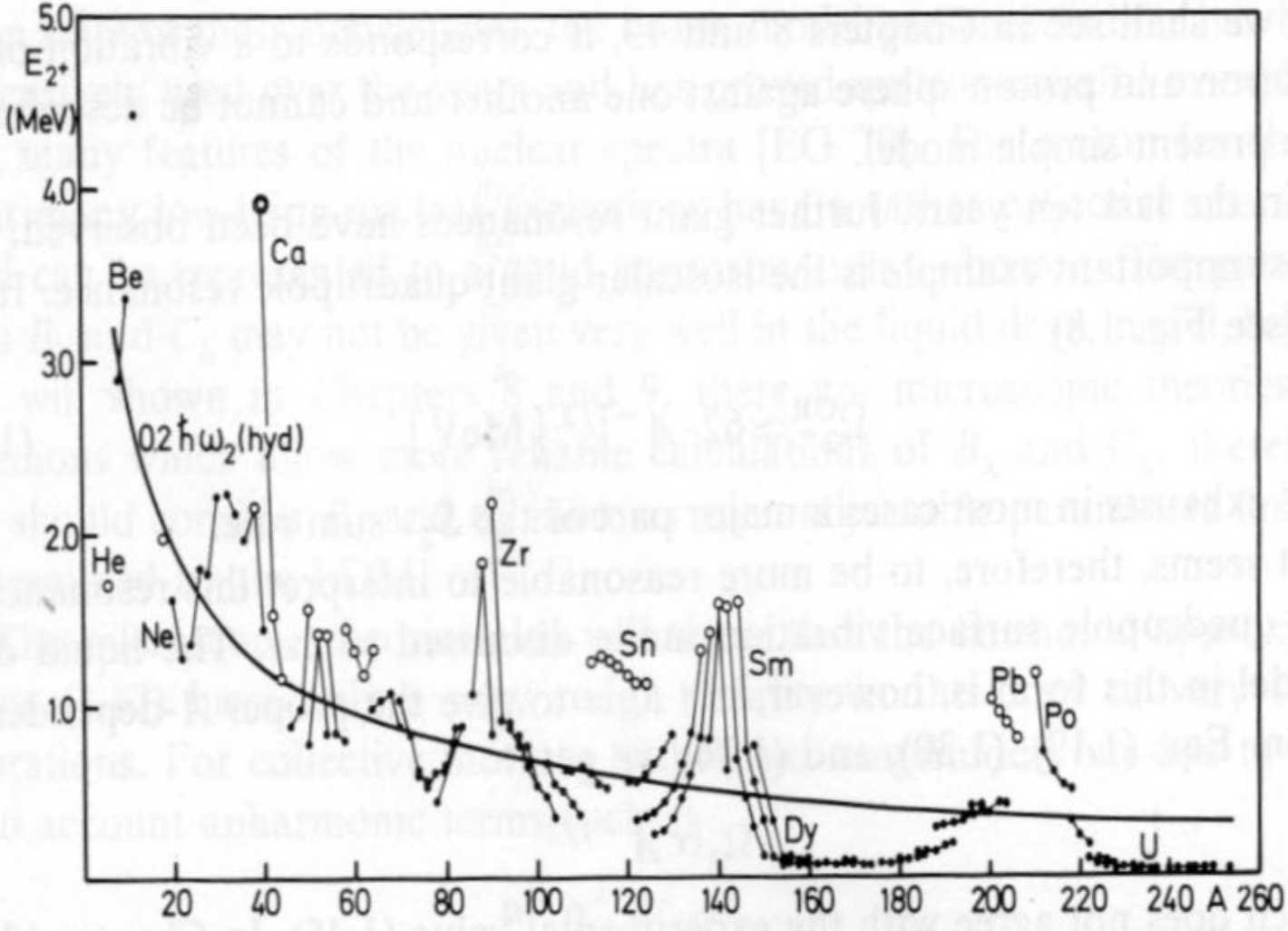


Figure 1.7. The energy of the first 2^+ state in even–even nuclei. The nuclei with closed neutron or proton shells are marked by open circles. (From [NN 65].)

Fig. 5-5

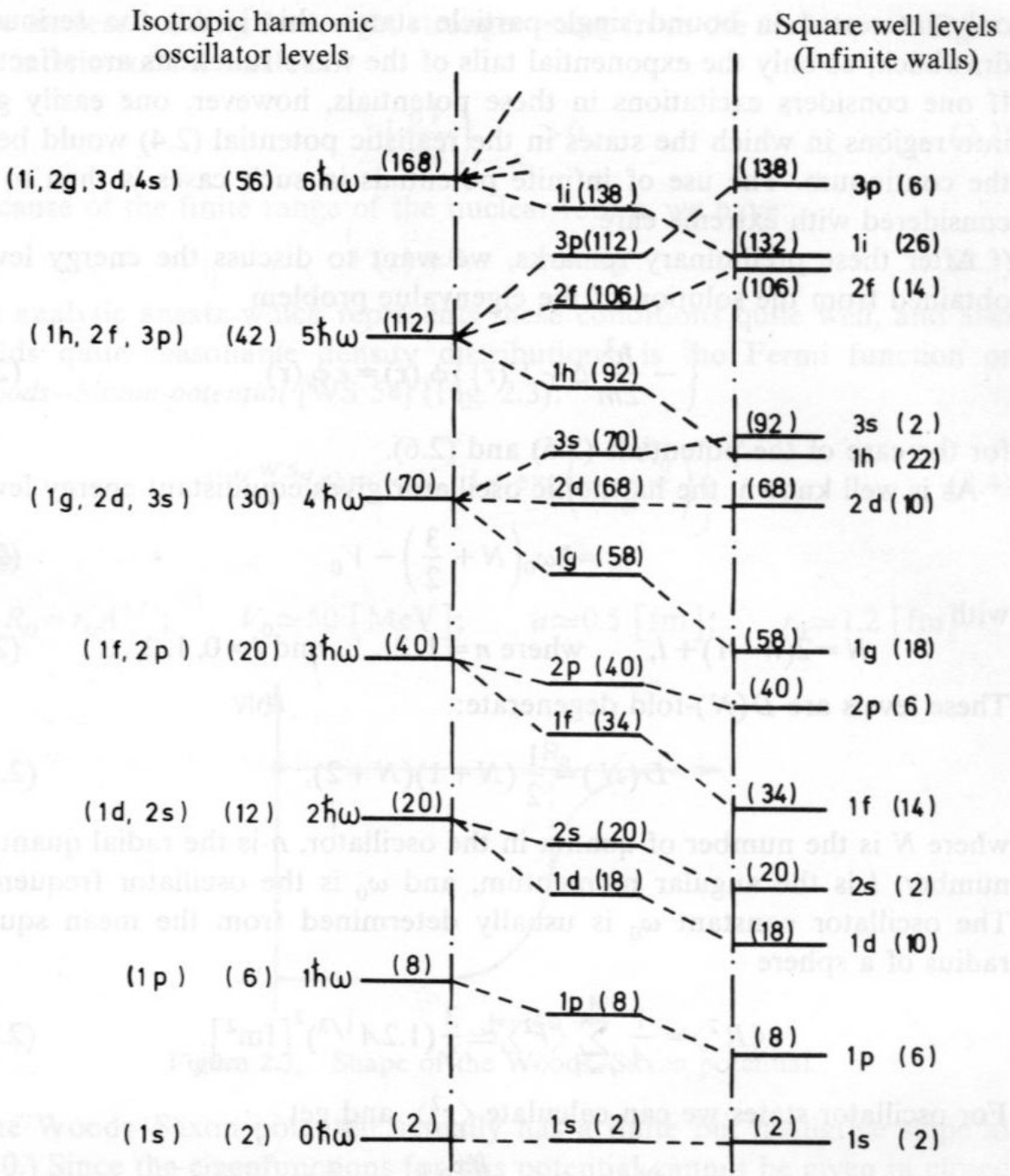


Figure 2.4. Level scheme of the isotropic harmonic oscillator (l.h.s.) and of the infinite square well (r.h.s.). (From[MJ 55]).

Fig. 5-6

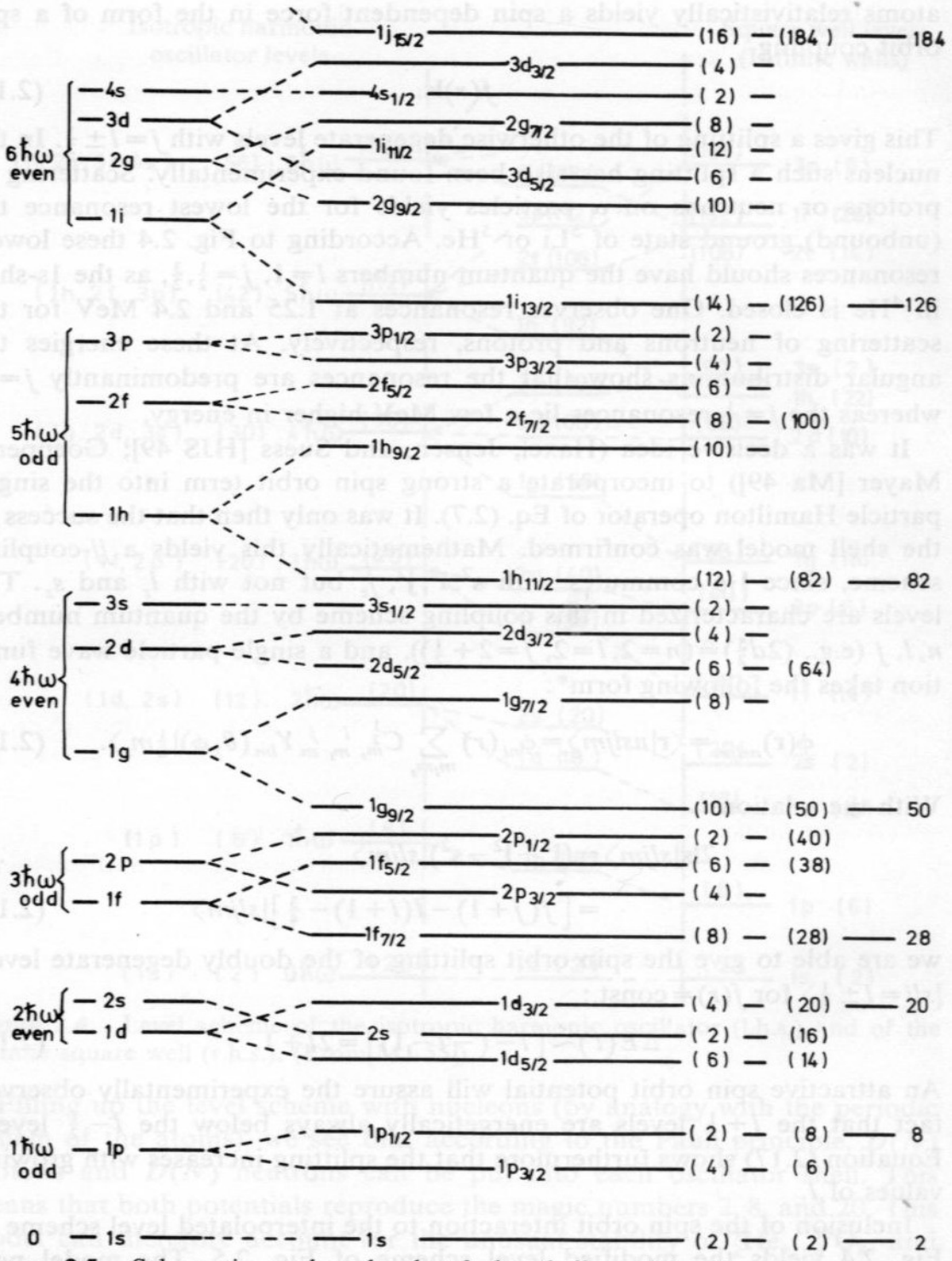


Figure 2.5. Schematic nuclear levels of the shell model with spin orbit term. (From [MJ 55].)

Fig. 5-7

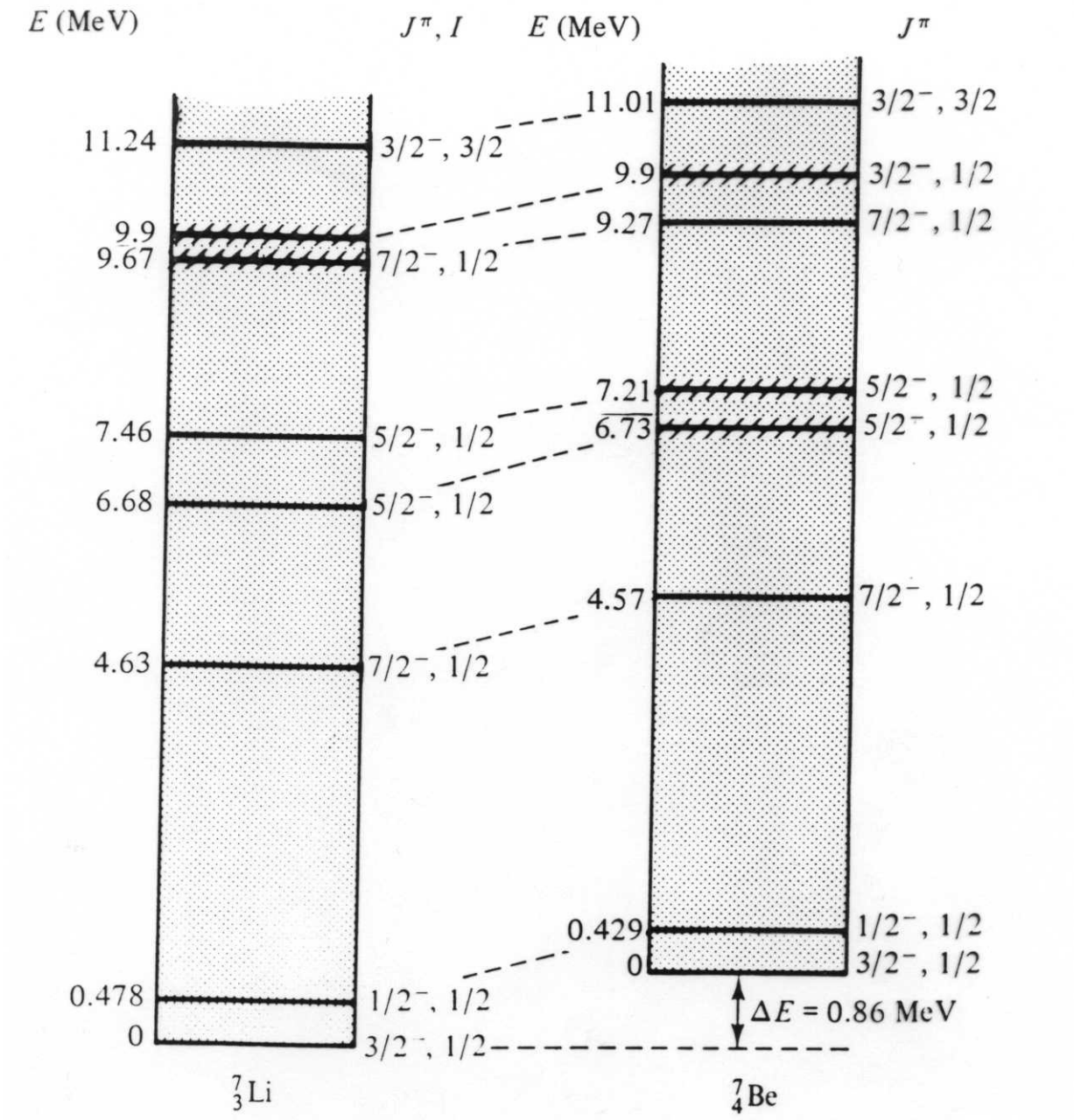

E (MeV)
J^π, I
E (MeV)
J^π
11.24
3/2⁻, 3/2
9.9
9.67
7/2⁻, 1/2
7.46
5/2⁻, 1/2
6.68
5/2⁻, 1/2
4.63
7/2⁻, 1/2
0.478
1/2⁻, 1/2
0
3/2⁻, 1/2
11.01
9.9
9.27
7.21
6.73
4.57
0.429
0
ΔE = 0.86 MeV
$^7_3$Li
$^7_4$Be

Fig. 5-8

Spaltung von ^{235}U nach Neutroneneinfang

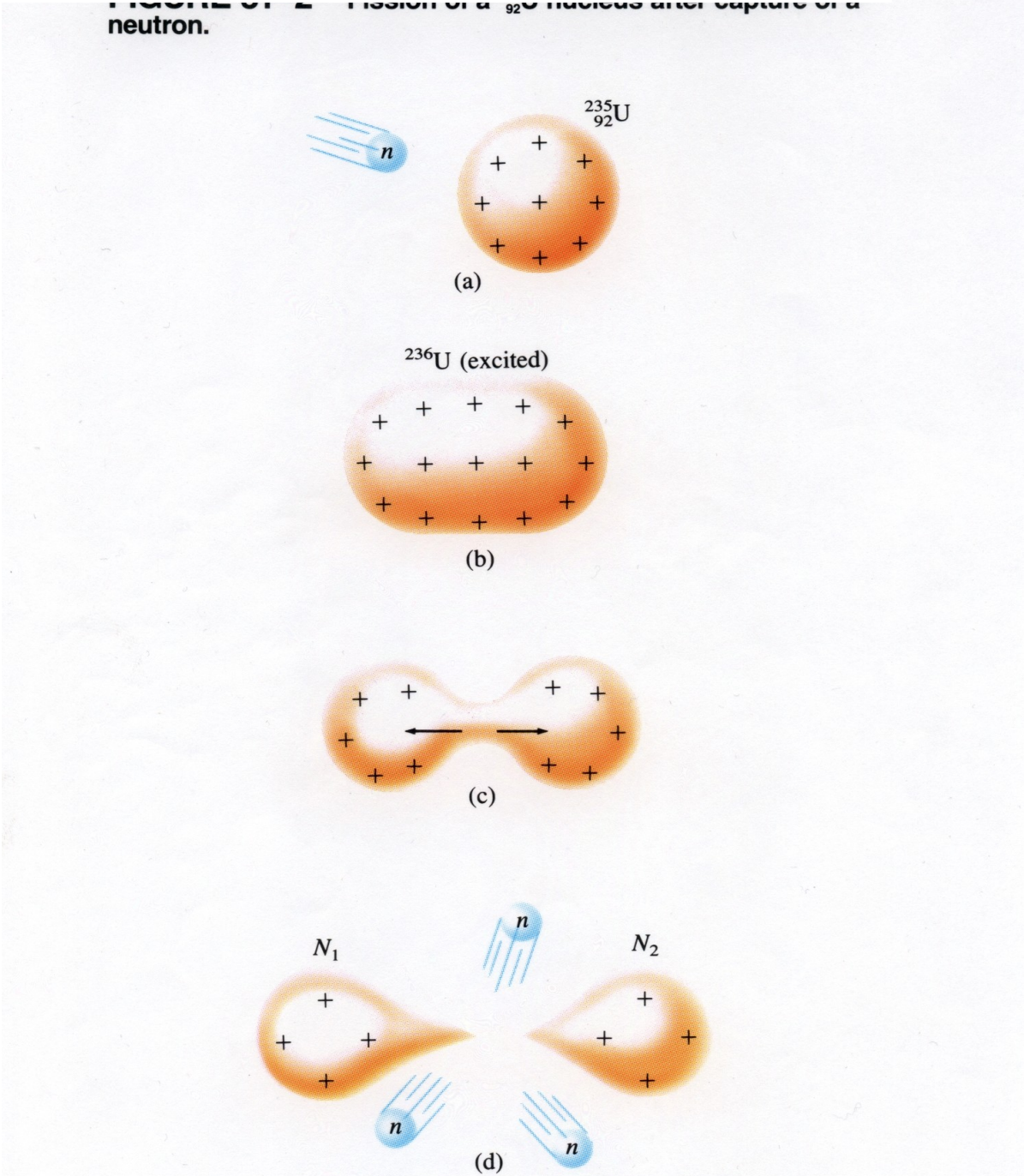
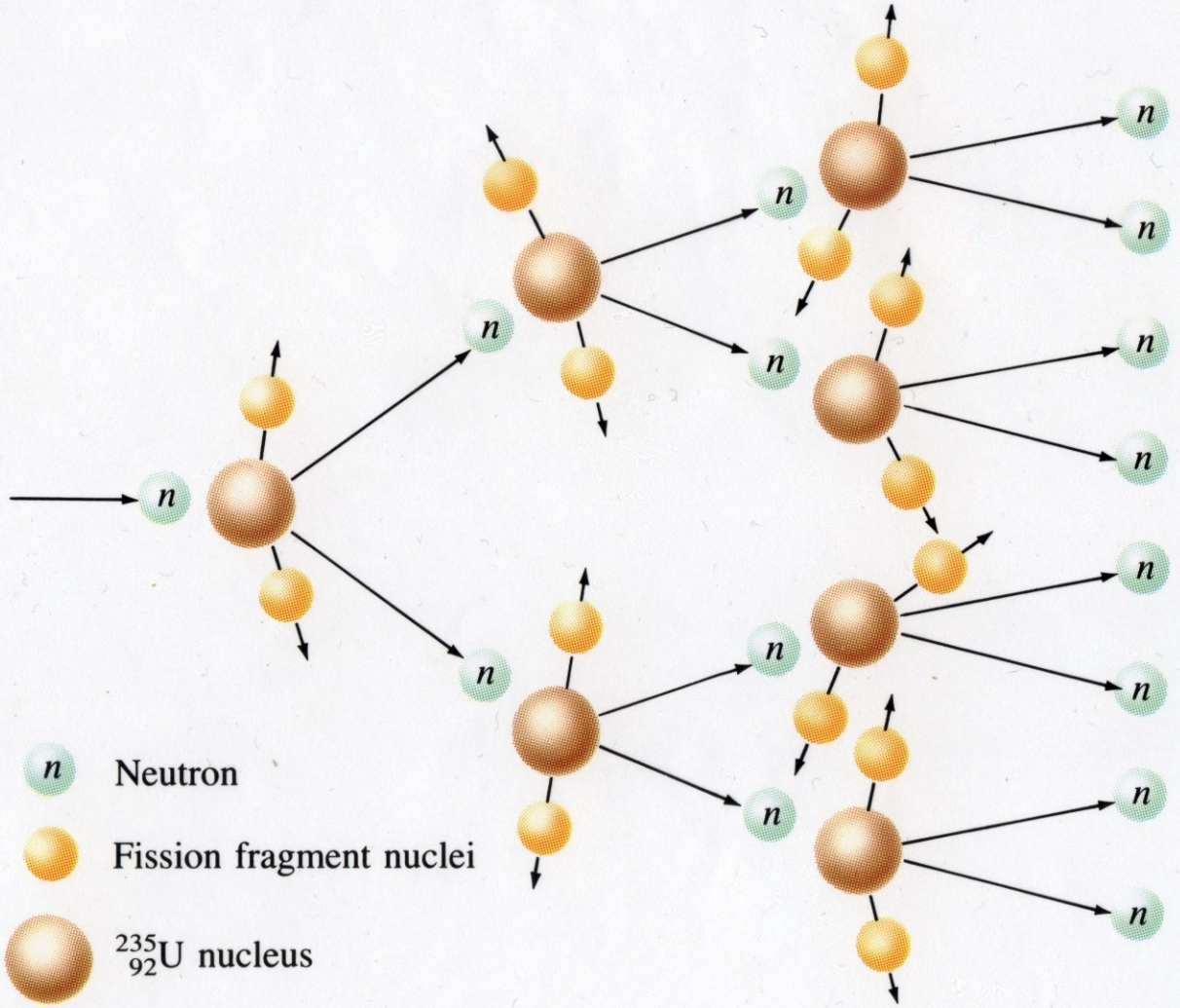


Fig. 5-9

Prinzip der Kettenreaktion:



GIANCOLI'S PHYSICS:
PRINCIPLES WITH APPLICATIONS, 3/E

Fig. 5-10

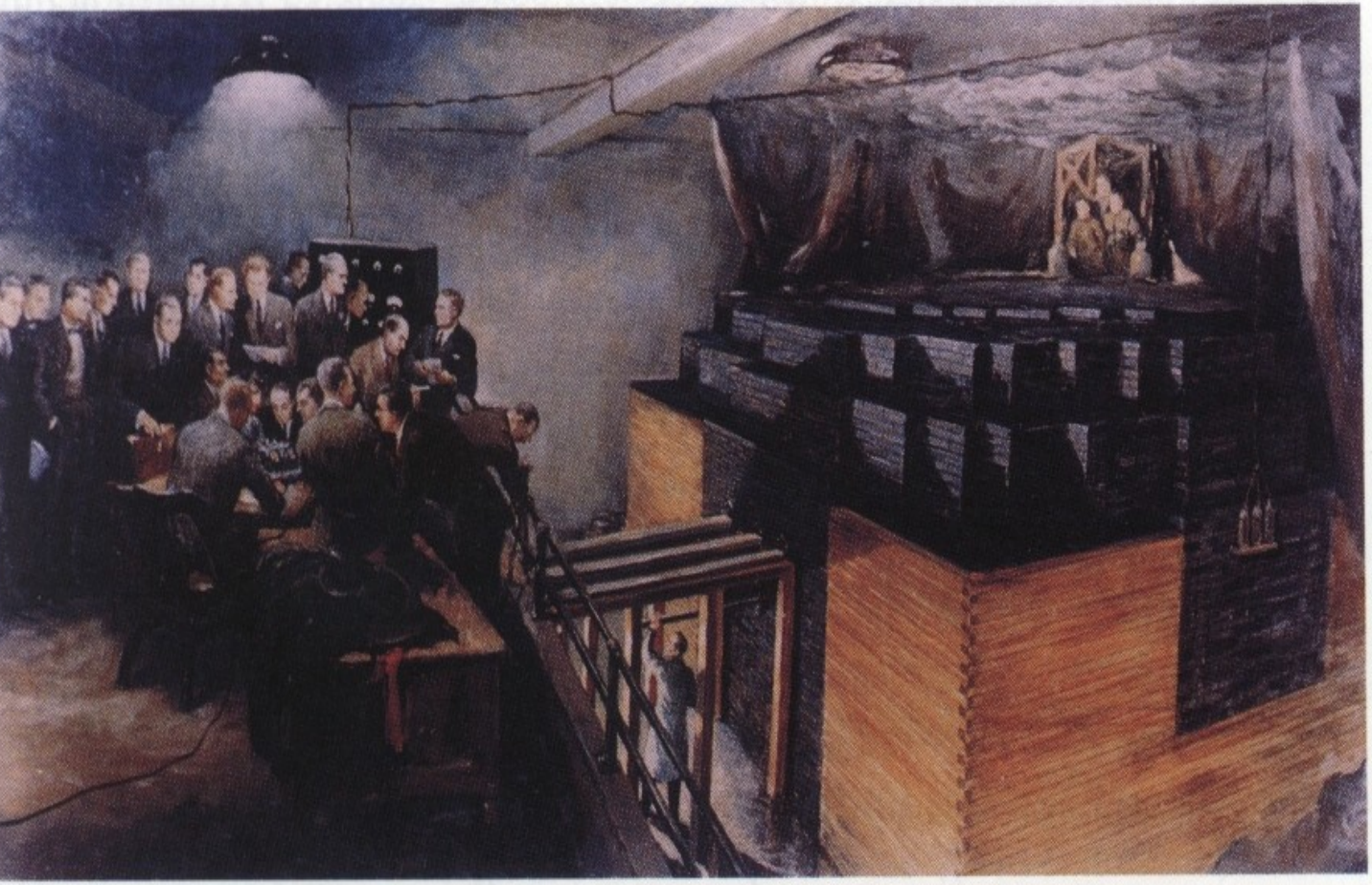
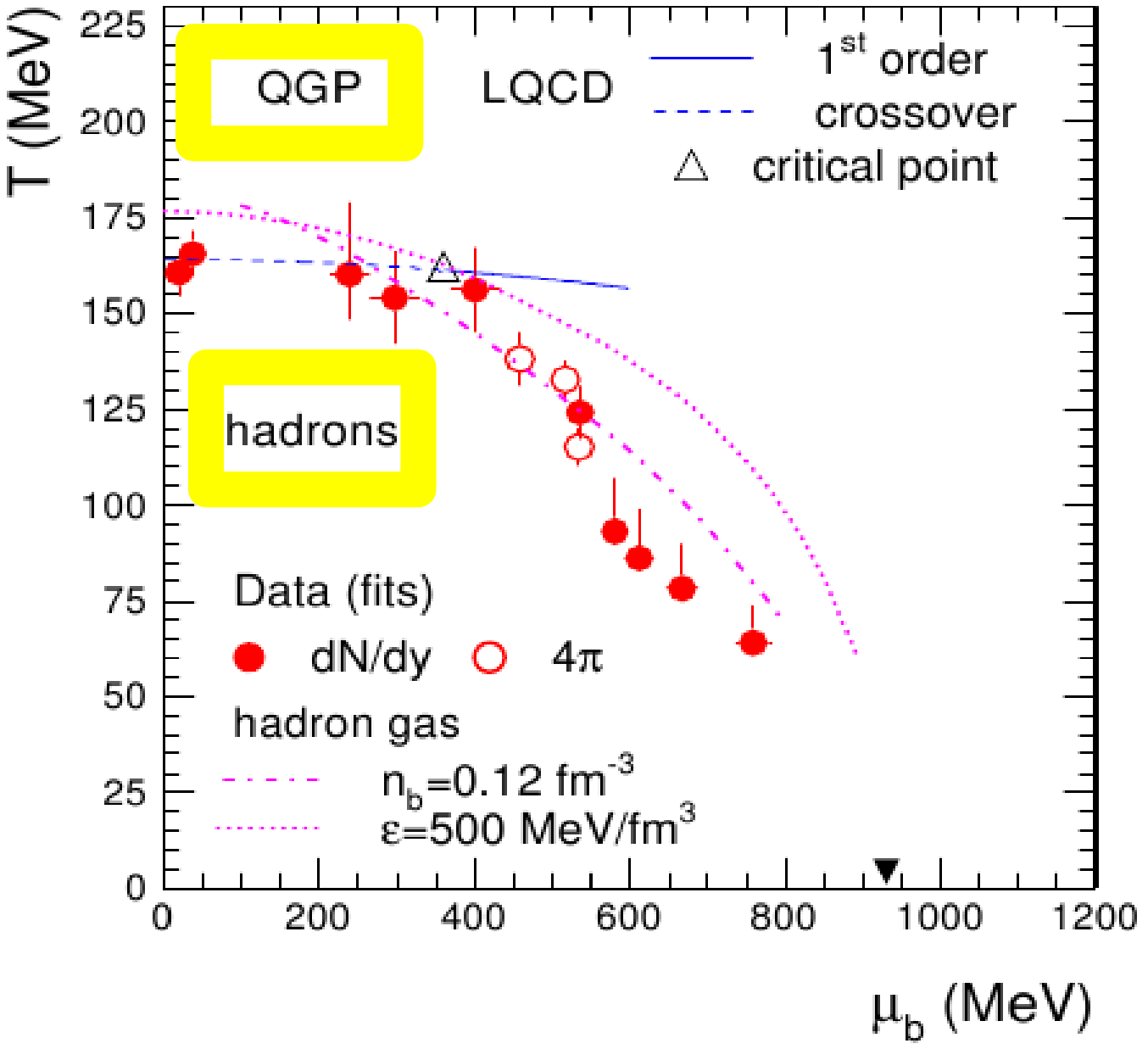


FIGURE 31–4 Color painting of the first nuclear reactor, built by Fermi under the grandstand of Stagg Field at the University of Chicago. (There are no photographs of the original reactor because of military secrecy.) Natural uranium was used with graphite as moderator. On December 2, 1942, Fermi slowly withdrew the cadmium control rods and the reactor went critical. This first self-sustaining chain reaction was announced to Washington, by telephone, by Arthur Compton who witnessed the event and reported: "The Italian navigator has just landed in the new world."

Fig. 5-11


T (MeV)
225
200
175
150
125
100
75
50
25
0
0
200
400
600
800
1000
1200
μb (MeV)
QGP
LQCD
1st order
crossover
critical point
hadrons
Data (fits)
dN/dy
4π
hadron gas
nb=0.12 fm-3
ε=500 MeV/fm3