Seyler-Blanchard effective nucleon-nucleon force. We fitted five of the six adjustable parameters of the force to nuclear binding energies corrected for shell and pairing effects and for the Wigner term, using the sixth parameter to keep the width of the surface diffuseness at $b_0 = 1.0$ fm. The resulting RMS error in the mass fit was 0.711 MeV, comparable to the fit obtained with the shape-dependent Droplet Model of [26]. Using the resulting parameter set, we found that the sizes of nuclear charge distributions were in agreement with measurements and that fission saddle point energies of elements down to Z = 71 could be reproduced with only relatively minor (though systematic) discrepancies. The extrapolated binding properties of neutron matter turned out to be in striking correspondence with the theoretical estimate of [1]. Introducing a seventh (density-dependence) parameter in the effective interaction, we were able to give a fair account of the nuclear optical model potential.

On a finer scale there are, to be sure, systematic discrepancies in the trends of fission barriers, density distribution profiles and the optical model potential. Some might be due to imperfections in the effective interaction, some are surely due to the approximate nature of the Thomas-Fermi treatment. But overall we now have available a robust statistical model that shows a good correspondence with a large and varied amount of data on finite nuclei. We believe that the resulting predictions for the bulk and surface properties of nuclear matter, listed in Section 4, should be quite reliable as regards the principal (liquid drop) parameters r_0, a_1, a_2, J, and to provide fair estimates of the remaining more subtle (Droplet Model) quantities.

We will continue studying nuclei under extreme conditions of charge, isospin and, especially, angular momentum, using, as Fermi would have said, "Un metodo statistico per la determinazione di alcune proprietá del nucleo."

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