Figure 4.1: Subclass relationships between OWL2 and RDF/RDFS

between some modeling primitives of OWL2 and RDF/RDFS.

The advantage of this limited expressiveness is that it permits efficient reasoning support. OWL2 DL can make use of a wide range of existing reasoners such as Pellet, FaCT, RACER, and HermiT. The disadvantage is that we lose full compatibility with RDF. An RDF document will in general have to be extended in some ways and restricted in others before it is a legal OWL2 DL document. However, every legal OWL2 DL document is a legal RDF document.

One of the main motivations behind the layered architecture of the Semantic Web (see figure 1.4) is a hope for downward compatibility with corresponding reuse of software across the various layers. However, the advantage of full downward compatibility for OWL2 (any OWL2-aware processor will also provide correct interpretations of any RDF Schema document) is only achieved with OWL2 Full, at the cost of computational intractability.

In section 4.5 we will continue this discussion in relation to three additional *profiles* of OWL2, each of which seeks a different trade-off between expressiveness and efficient reasoning.