B.3 Other Additional Features

B.3.1 The __proto__ pseudo property

B.3.1.1 Object.prototype._proto_

The initial value of the __proto__ property of the Object prototype object is a data property whose initial value is null. This property initially has the attributes { [Writable]: true, [Enumerable]: true, [Configurable]: true }.

Manipulations of this property as tracked by the Boolean valued primordial internal variable UnderscoreProtoEnabled. The default initial value of UnderscoreProtoEnabled is true only if this property is initially present on the primordial Object prototype object.

NOTE  Any modification of this property or its attributes causes UnderscoreProtoEnabled to be set to false.

B.3.1.2 Changes To Internal Methods

The definition of the [[Get]] internal method given in 8.12.3 is replaced with the following:

1. If P is the string value "__proto__" and UnderscoreProtoEnabled is true, then
   a. Let desc be the result of calling the [[GetOwnProperty]] internal method of O with property name P.
   b. If desc is not undefined and was create by step 1a to describe the property defined in B.3.1.1 then
      i. Return the value of the [[Prototype]] internal property of O.
   2. Continue by executing the steps of 8.12.3 starting with step 1.

The definition of the [[Put]] internal method given in 8.12.5 is replaced with the following:

1. If P is the string value "__proto__" and UnderscoreProtoEnabled is true and O is not the standard built-in Object prototype object, then
   a. Let desc be the result of calling the [[GetOwnProperty]] internal method of O with property name P.
   b. If desc is not undefined and was create by step 1a to describe the property defined in B.3.1.1 then
      i. If the type of P is neither Object or Null, return
      ii. Set the value of the [[Prototype]] internal property of O to V.
      iii. Return
   2. Continue by executing the steps of 8.12.5 starting with step 1.

The definition of the [[Delete]] internal method given in 8.12.7 is replaced with the following:

1. If UnderscoreProtoEnabled is true and P is the string value "__proto__" and O is the standard built-in Object prototype object, then
   a. Set UnderscoreProtoEnabled to false
   2. Continue by executing the steps of 8.12.7 starting with step 1.

The definition of the [[DefineOwnProperty]] internal method given in 8.12.9 is replaced with the following:

1. If UnderscoreProtoEnabled is true and P is the string value "__proto__" and O is the standard built-in Object prototype object, then
   a. If any attribute contained in Desc is not present or has a different value from the corresponding attribute in { [Writable]: true, [Enumerable]: true, [Configurable]: true } then
      i. Set UnderscoreProtoEnabled to false
   2. Continue by executing the steps of 8.12.9 starting with step 1.
B.3.1.3  __proto___ Object Initialisers

Definitions of two algorithms in 11.1.5 are replaced with the following:

The production PropertyNameAndValueList : PropertyAssignment is evaluated as follows:

1. Let obj be the result of creating a new object as if by the expression new Object() where Object is the standard built-in constructor with that name.
2. Let propId be the result of evaluating PropertyAssignment.
3. If propId.name is the string value __proto__ and UnderscoreProtoEnabled is true and IsDataDescriptor(propId.descriptor) is true, then
   a. Let v be propId.descriptor.value.
   b. If desc be propId descriptor
      c. If the type of v is either Object or Null,
         i. Set the value of the [[Prototype]] internal property of O to V.
   i. Return.
4. Call the [[DefineOwnProperty]] internal method of obj with arguments propId.name, propId.descriptor, and false.
5. Return obj.

The production PropertyNameAndValueList : PropertyNameAndValueList , PropertyAssignment is evaluated as follows:

1. Let obj be the result of evaluating PropertyNameAndValueList.
2. Let propId be the result of evaluating PropertyAssignment.
3. Let previous be the result of calling the [[GetOwnProperty]] internal method of obj with argument propId.name.
4. If previous is not undefined then throw a SyntaxError exception if any of the following conditions are true
   a. This production is contained in strict code and IsDataDescriptor(previous) is true and IsDataDescriptor(propId.descriptor) is true.
   b. IsDataDescriptor(previous) is true and IsAccessorDescriptor(propId.descriptor) is true.
   c. IsAccessorDescriptor(previous) is true and IsDataDescriptor(propId.descriptor) is true.
   d. IsAccessorDescriptor(previous) is true and IsAccessorDescriptor(propId.descriptor) is true and both previous and propId.descriptor have [[Get]] fields or both previous and propId descriptor have [[Set]] fields.
5. If propId.name is the string value __proto__ and UnderscoreProtoEnabled is true and IsDataDescriptor(propId.descriptor) is true, then
   a. Let v be propId.descriptor.value.
   b. If desc be propId descriptor
      c. If the type of v is either Object or Null,
         i. Set the value of the [[Prototype]] internal property of O to V.
   i. Return.
5. Call the [[DefineOwnProperty]] internal method of obj with arguments propId.name, propId.descriptor, and false.
6. Return obj.