Pure Mathematics

1895 [c.] | On Quantity, with special reference to Collectional and Mathematical Infinity | MS [R] 14:4

There is *pure* mathematics and *applied* mathematics. Pure mathematicians should strenuously object to a definition which should limit their hypotheses to such as are subservient to the discovery of objective truth. A romancer who draws any necessary deductions from the situations he creates (as every romancer does) is beyond doubt doing mathematical work; and the charm of romance is in part due to the natural interest we have in tracing necessary consequences. But this is applied mathematics for the reason that the hypotheses are clothed with accidents which are not relevant to the forms of deduction. Mathematical hypotheses are such as are adapted to the tracing of necessary conclusions; the hypotheses of *pure* mathematics are stripped of all accidents which do not affect the form of deduction, that is, the relations of the conclusions to the premises.

We thus finally reach this definition. *Mathematics* is the study of the substance of hypotheses with a view to the tracing of necessary conclusions from them. It is *pure* when the hypothes[e]s contain nothing not relevant to the forms of deduction.

In the original, the last line reads "It is *pure* when the hypothesis contain nothing not relevant to the forms of deduction"

1895 [c.] | On Quantity, with special reference to Collectional and Mathematical Infinity | NEM 4:267-268

…the distinguishing characteristic of mathematics is that it is the scientific study of hypotheses which it first frames and then traces to their consequences. Mathematics is either *applied* or *pure*. Applied mathematics treats of hypotheses in the forms in which they are first suggested by experience, involving more or less of features which have no bearing upon the forms of deduction of consequences from them. Pure mathematics is the result of an afterthought by which these irrelevant features are eliminated.

1902 | Truth and Falsity and Error | CP 5.567

Projective geometry is not pure mathematics, unless it be recognized that whatever is said of rays holds good of every family of curves of which there is one and one only through any two points, and any two of which have a point in common. But even then it is not pure mathematics until for points we put any complete determinations of any two-dimensional continuum. Nor will that be enough. A proposition is not a statement of perfectly pure mathematics until it is devoid of all definite meaning, and comes to this – that a property of a certain icon is pointed out and is declared to belong to anything like it, of which instances are given. The perfect truth cannot be stated, except in the sense that it confesses its imperfection. The pure mathematician deals exclusively with hypotheses.

1903 | Lowell Lectures. 1903. Lecture 3 | MS [R] 459:4

…I would define Pure Mathematics as the science of pure hypotheses perfectly definite in all respects which can create or destroy forms of necessary consequences from them and entirely indeterminate in other respects.

1903 | Useful for 3rd or 4th? | MS [R] 466:10-11

I […] define *Pure* Mathematics as that Mathematics which leaves its assumptions entirely indeterminate in respects which have no bearing upon the manner in which they can be combined to produce conclusions.

1903 | Lecture 5,. Vol. 2 | MS [R] 470:132

Pure mathematics differs from mathematics in general in not admitting into its hypotheses any element that does affect their logical possibility or impossibility.

1903 [c.] | On Dyadics: the Simplest Possible Mathematics | MS [R] 3:1

Mathematics will here be understood to be the science which sets up hypotheses with a view to doing what it proceeds to do, namely, to deduce their consequences, and to study the methods of doing so. Pure Mathematics will be understood to be a kind of mathematics which, as far as possible, eliminates from its hypotheses all that does not concern the forms of deduction of consequences from them.

1906 [c.] | L [R] | MS [R] 601:21-22

… pure Mathematics […] is simply the science of the necessary and definite results that would flow from the truth of propositions, as to whose actual truth the group of mathematicians, as such, professes neither responsibility nor interest.