A P P E N D I X

MAIN SECTION OF THE FOURTH FAMILY OF NUMBERS THEORY BY H.POINCARE

IS UNIVERSAL SECTION FOR PROOFS FERMAT'S THEOREM AND CONJECTURE BEAL

The Chain of arithmetical and geometric forms,
described above, is necessary
to be closed on main section of the fourth family of Numbers theory
by H.Poincare, (refer to Journal de l'Ecole Polytechnique,1882,Cahier 51,
45 – 91, § 12, Forms of fourth family):

(74) $$H = 3X_1^{\ 2}X_3 + X_2^{\ 3}$$

having connected this section with natural base
of the numbers theory :

(75) 1, 2, 3, 4, 5, 6, 7, 8, 9,…

For this purpose it is necessary to use the following substitutions :

(76) $$\left| \begin{array}{l} X_1 = 1 \\ X_2 = 2 \\ X_3 = 3 \end{array} \right.$$

Form (74) in this case degenerates in fundamental amount of two
componentnumbers of the natural row,
which form the prime number :

(77) $$17 = 9 + 8$$

Herewith exist to be two fundamental numeric forms,
described in my articles:

(78)
$$\left| \begin{array}{l} X_1 + X_2 = X_3 \\ 1 + 2 = 3 \end{array} \right.$$

(79)
$$\left| \begin{array}{l} 9 = 1 + 8 = \\ = 1 + 2^3 \end{array} \right.$$

In accordance with theory of numbers by H.Poincare we can make a study of several mains of the given forms, which belong to numbers of corresponding class .

H.Poincare analyses one class of numbers, which contain the single maintransformation, determination of which is equal to one:

(80)
$$S_1 = \left| \begin{array}{ccc} ha_1 & ha_2 & ha_3 \\ kb_1 & kb_2 & kb_3 \\ lc_1 & lc_2 & lc_3 \end{array} \right|$$

The Substitutions (76) and the form (78) take us to the other class of numbers, (klass rational quantities) , which contains its single main form, determinant of which is equal to one :

81)
$$S^*{}_1 = \left| \begin{array}{ccc} 3/2 & 1 & 1/2 \\ -1/2 & 2/3 & -1/3 \\ -1 & -2/3 & 1/3 \end{array} \right|$$

The Elements of this form are built from two relative forms, which followfrom the form (78):

(82)
$$\begin{array}{l} 1/3 + 2/3 = 1 \\ 1/2 + 1 = 3/2 \end{array}$$

and which give us zero on the right and zero on the left:

(83)
$$1/3 + 2/3 - 1 = 0$$
$$1/2 + 1 - 2/3 = 0$$

(84)
$$0 = 1 - 1/3 - 2/3$$
$$0 = 3/2 - 1/2 - 1$$

From numbers of the natural row is formed an endless row of pairs of numbers v > u of different parity:

(85) $2 > 1$, $3 > 2$, $4 > 3$, $5 > 4$,……

These numbers form the endless rows of primitive Pythagora triads:

(86)
$$\left| \begin{aligned} \mathbf{a_0} &= \mathbf{v^2 - u^2} \\ \mathbf{b_0} &= \mathbf{2vu} \\ \mathbf{c_0} &= \mathbf{v^2 + u^2} \end{aligned} \right.$$

(87)
$$\left| \begin{aligned} \mathbf{2a_0} &= \mathbf{v^2 - u^2} \\ \mathbf{2b_0} &= \mathbf{2vu} \\ \mathbf{2c_0} &= \mathbf{v^2 + u^2} \end{aligned} \right.$$

which are a component element of the substitutions:

(88)
$$\left| \begin{aligned} \mathbf{(X - A)} &= \mathbf{a_0} \\ \mathbf{X} &= \mathbf{b_0} \\ \mathbf{(X + B)} &= \mathbf{c_0} \end{aligned} \right.$$

and accordingly:

(89)
$$\left| \begin{array}{l} (X - A) = a_0^{\,2} \\ X = b_o^{\,2} \\ (X + B) = c_0^{\,2} \end{array} \right.$$

According to endless row of numbers (85) , from substitutions (88), for form (86),
is calculated an endless row of simple (primes) numbers:

(90) A = 1 ; 7 ; 17 ; 31 ; 49 : 71 …..

and from substitutions (89) , for form (86) , is calculated other endless rowof simple (primes) numbers:

(91) A = 7 ; 119 ; 527 ; 1519 ; 3479 ; 6887 …

Accordance:

According to endless row of numbers (85) , from substitutions (88), for form (87),
is calculated an endless row of rational quantities:

(92) A = 0.5 ; 3.5 ; 8.5 ; 15.5 ; 24.5 ; 35.5 ;…

and from substitutions (89) , for form (87) , is calculated other endless rowof rational quantities:

(93) A = 1.75 ; 29.75; 131.75 ; 379.75 ; 869.75 ; 1721.75 ;

All these numbers are not divided on number 16.

Herewith if substitutions (86) are used, numbers B take negative meaning. If substitutions (87) are used, numbers B take positive imeaning.

So is fixed the direct relationship of main form (74) of the fourth family of H.Poincare numbers theory with equations of non-modular elliptical curves:

$$Y^2 = (X - A) \times X \times (X + B)$$

and system of the equations:

$$a^n + b^n = c^n$$

$$A^x + B^y = C^z$$

$$A^p x + B^q y = C^r z$$