

PHILAMATH

A JOURNAL OF
MATHEMATICAL
PHILATELY



Volume XXI, No. 4

April, 2000

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PHILAMATH is a publication of the Mathematical Study Unit of The American Topical Association And The American Philatelic Society

The MSU is pleased to welcome the following new members:

- 369. Paul G. Partington; 7320 South Gretna Avenue; Whittier, CA 90606
- 370. Ruud van Dam; Snipperthorst 17; 7531 DZ Enschede; THE NETHERLANDS

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- 319. Emmanuel Even; 7 rue Dautancourt; 75017 Paris; FRANCE
- 354. Alfred M. Barron; 150 Hillside Avenue; Metuchen, NJ 08840

DUES REMINDER

Membership renewal time is upon us. Please send your dues for 2000-2001 (\$10.00 North America; \$13.00 overseas) to:

Estelle A. Buccino
Secretary-Treasurer
5615 Glenwood Road
Bethesda, MD 20817-6727 U.S.A.

Note: Individual reminders are enclosed with this issue. If you did not get a reminder, that means you are paid through June 2001 and do not need to submit dues at this time.

REPORT FROM WASHINGTON

"A thousand years in fifty minutes" -- so began **Robin Wilson** by way of introduction to his special presentation, *Stamping through the Millennium*, at the Mathematical Association of America session on January 20, 2000. Although the slide-illustrated talk lasted slightly longer than his stipulated time, Professor Wilson met the challenge of documenting the past 1000-year history of mathematics via postage stamps. The slides were a visual treat in their color definition and the clarity of each reproduction. I wished that each one of you could have been there to experience it personally. However, since you were not, the next best thing is to wait for Professor Wilson's forthcoming book, of which this talk is just a part. His publisher, Springer, expects to have the volume available in time for Christmas.

Estelle A. Buccino (#21)
Secretary-Treasurer

From the Editor

- All members of the MSU should have a Belgian stamp celebrating the year 2000 as the World Mathematical Year included with this issue of Philamath. The stamp shows several aspects of mathematics. The row of marks at the bottom of the stamp represent the Ishango bone, one of the oldest mathematical finds. The marks are believed to represent various phases of the moon. Jean de Heinzelin discovered the bone in 1960 in Zaire and the name Ishango comes from the people who inhabited the area 6,000 to 9,000 years ago. However the bone may be 20,000 years old. The integral equation on the stamp represents 'an elegant final and unified version of infinitesimal calculus.' The bottom equation is a statement of Fermat's Last Theorem. A special thanks to Professor R. Vandevoorde for taking the time to quickly respond to the request for the stamps.
- I would like to continue the free gift of a mathematical related stamp in upcoming issues of Philamath. If you know of any new or older mathematical related stamps that can be purchased at or below face value please let me know. Include a description of the stamp if possible.
- The question below appeared in the January issue of Philamath:

Can anyone identify the following equation which appears on a recent (late 1999) People's Republic of China stamp:

$$P_x(1,2) \geq (.67x C_x) / (\log x)^2$$

Several members responded, all with similar answers. Mike Chappell was the first to respond and stated that the New Issues section of the UK Stamp & Postcard Gazette described the stamp as featuring "The best result for the Goldbach Conjecture".

I am again pleading for more articles for Philamath. The backlog is VERY low. Please help.



Special German cancellation of Georg Cantor. Thanks to MSU member Dr. Kurt Richter.

A is for Algebra

The history of Algebra can be traced through a collection of stamps

ALGEBRA:- The branch of elementary mathematics that generalises arithmetic by using Variables (symbols) to range over numbers, e.g. $x + y = y + x$

The first reference to the word *al-jabur* becoming the word algebraic was by the 9th century mathematician **Mohammed al-Khwarizmi (780c-850)** born in Persia but shown on a Russian stamp. Issued 1983 celebrating the 1200th anniversary of Mohammed al-Khwarizmi.



The second big advance in the use of symbols was in the 16th century by the French mathematician **Rene Descartes (1596-1650)** who introduces symbols for the unknown algebraic powers and operations. His birth is commemorated on a French stamp issued in 1996.



The 17th century was dominated by two giants of mathematics the English mathematician **Sir Isaac Newton (1643-1727)** and the German mathematician **Gottfried Wilhelm Leibniz (1646-1716)**. No English stamp carries a portrait of Newton, but several other countries do. The stamp I have chosen is a Bulgarian stamp showing a portrait of Newton and his equation in algebraic form of the force between large bodies. Leibniz is shown on several German stamps.



In the 18th century the development continued. Two young mathematicians. **Niels Henrik Abel (1802-29)** Norwegian mathematician made significant contributions to algebra and to analysis. **Évariste Galois (1811-32)** French Mathematician wrote several papers on the theory of function, the theory of equations and number theory. Both died relatively young, both are commemorated on stamps of the country of their birth.



The development continued in to the 19th century. The work of French mathematician **Baron Louis Augustin Cauchy (1789-1857)** introduced rigor to virtually all branches of mathematics. The French stamp showing a portrait of Cauchy also has an algebraic formula for the curves on a graph. **Sir William Rowan Hamilton (1805-65)** the Irish algebraist completes the history up to the 20th



century. **Hamilton** is commemorated by the Irish from a bust designed by Hogan in the library of Trinity College Dublin. The modern mathematicians are unlikely to be depicted on stamps until some years after their death.



PURE INVESTIGATION WITH STAMPS By D.WILLIAMS

The British Post Office is to issuing several sets for the Millennium. Suppose the Post Office decided to issue only two values of stamp. This ceated a simple problem. What values would be required to obtain a consecutive run of prices?. The first table gives three examples, 5p and 7p, 6p and 8p, 3p and 8p. The number of stamps is given along the top and down the side of each table. In the case of 5p, and 7p, the price becomes consecutive at 24p, 3p and 8p at 14p. In the case of 6p and 8p no odd values can be obtained.

stamps		5p								6p						3p									
		No	0	1	2	3	4	5	6	7	8	No	0	1	2	3	4	5	No	0	1	2	3	4	5
7p	0		5	10	15	20	25	30	35	40		0	6	12	18	24	30		0	3	6	9	12	15	18
	1	7	12	17	22	27	32	37			1	8	14	20	26	30	36	1	8	11	14	17	20	23	27
	2	14	19	24	29	34	39	44			2	16	22	28	34	40	2	16	19	22	25	28	31		
	3	21	26								3	24						3	24	27	30	33	36	39	
	4	28	33								4	32						4	32	35	38	41			
	5	35	40																						



Now consider 4p and 9p, some values are missing so the sequence can not be continuous

stamps		4p					
		No	0	1	2	3	4
9p	0		4	8	12	16	20
	1	9	13	17	21	25	29
	2	18	22	26	30		
	3	27	31	35	39		
	4	36	40				
	5	45					

- What conclusions can we draw from this investigation
1. The price chosen must include an odd number, not a multiple of any other number i.e. A prime number (one that is devisable by its self and one).
 2. If the Post Office choose a price for second class mail of 24p and using two stamps 5p and 7p any value above this up to £1 can be obtained
 3. This can also be used for values above £1.
 4. To find the point at which the prices become consecutive a simple formula can be used $\{(stamp\ value\ 1)-1\} \times \{(stamp\ value\ 2)-1\}$
 6. The envelope must be large enough to take all the stamps!!

North Korea's Newton Stamps

With a Checklist of all Newton Stamps Known to Man

by

Craig Smoryński

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In the May 1990 issue of *Michel Rundschau*, there appeared an announcement that the Peoples' Democratic Republic of North Korea would be issuing a set of 4 stamps and 1 souvenir sheet in July of that year to celebrate Sir Isaac Newton's 350th birthday. Anyone familiar with North Korea's other scientific offerings— the Madame Curie, Kepler, Mendeleev, or Halley's Comet issues— looked forward to seeing their commemoration of Newton. The wait was a bit longer than anticipated, but perhaps not longer than should have been expected, as Isaac Newton's 350th birthday did not come round until 1993, when the stamps finally appeared. Now, in 1997, I have photographs of the stamps and readily declare that they are well worth the wait.

In 1993, North Korea issued not 4, but 5 stamps, and not one, but 2 souvenir sheets. While the sheets are little more than strips of 3 stamps apiece with a common, lightly decorated border, the stamps themselves are magnificent and form the finest philatelic tribute to Sir Isaac yet offered by any postal authority. I venture to say that, had CPOSSU been aware of this set in early 1994, the North Korean Newtons might

very well have edged out Madagascar for the Most Significant Chemistry or Physics Postal Issue of 1993!

Each stamp bears the inscription "Newton. Sir Isaac/1642 – 1727". Newton's birthdate is, of course, a complicated matter. He was born on Christmas Day in 1642 according to the Julian Calendar then in force in England. According to the Gregorian Calendar, however, he was born on 4 January 1643, thus both making the inscription correct and 1993 his 350th birthyear. [Newton died on 31 March 1727 (Gregorian). The Nicaraguan Copernicus set nominated for one of CPOSSU's awards for 1994 bears the dates 1642–1726. This is not entirely incorrect, for, as any reader of Pepys will tell you, in those days the new year bore a double date for its first few months. Thus, March of 1727 was March of 1726/1727.]

The 10 Ch stamp of the set features Godfrey Kneller's portrait of 1702 of Newton at the age of 59. Kneller (1646 – 1723) was the leading portrait artist of the day and did several portraits of Newton, the first of which (reproduced in part on Russia *Scott* 5601) is the earliest (1689) extant portrait of the scientist. Kneller's 1702

portrait, however, is the philatelically most popu-



lar and has been several times reproduced. It hangs in the National Portrait Gallery in London.

The 20 Ch stamp repeats Kneller's second



portrait of Newton in cameo, but is otherwise devoted to gravitation— and a bit of biography. The Law of Gravitation is represented by the formula and an apple tree in front of Woolsthorpe Manor, Newton's birthplace.

The 30 Ch stamp again repeats the cameo. Newton's telescope, the first successful reflec-



tor and a common theme in Newton stamps, occupies centre stage. It is surrounded by the cameo and three space themes, the most relevant being a Korolev fuselage representing Newton's Third Law of Motion. There are also a radar antenna, the relevance of which escapes me, and a satellite, perhaps intended to represent orbits and Newton's derivation of Kepler's Laws of Planetary Motion???

The 50 Ch stamp is a bit of a mystery. It has the cameo and a globe with two orbiting objects, one fancy artificial satellite (perhaps the Soviet space station) and a dot (a more primitive satel-

lite no doubt). The centrepiece is a formula—the *Finite Binomial Theorem*. This is an unfortunate error. Newton's contribution to the Binomial Theorem was the infinite series representation for exponents other than positive integers; the form presented was known already to Blaise Pascal some years earlier. The notation is also certainly not Newtonian. The symbol C_n^k is the familiar binomial coefficient, which is usually written $\binom{n}{k}$ and occasionally ${}_n C_k$ or C_k^n . Thus, the notation is slightly incorrect.



The real mystery of the fourth stamp is not what the space symbols represent or how the super- and sub-scripts in the binomial coefficients got switched, but what is lurking in the background. Hiding behind the Binomial Expansion are a geometric diagram that I couldn't find in my copy of the *Principia* and a handwriting sample I similarly could not identify. I would

be grateful to anyone who can clear this up for me.

The 70 Ch stamp does not bear Kneller's portrait in cameo. Instead it features the statue of Newton from his tomb at Westminster Abbey, minus some of its kitschier surroundings. The



statue deserves some comment. It depicts Newton reclining on a stack of 4 books, his *Divinity*, *Chronology*, *Opticks*, and *Principia*. It is not clear from the reproduction on the stamp just how many books there are, or, indeed, that his support consists of books. Westfall's description of the whole reveals not only what is left out of the philatelic reproduction, but why it was left out. It is, according to the famous Newton scholar, "a baroque monstrosity with cherubs holding emblems of Newton's discoveries, Newton himself in a reclining posture, and a female figure representing Astronomy the Queen of the Sciences, sitting and weeping on a globe that sur-

mounts the whole. Twentieth-century taste runs along simpler lines, and the monument is now roped off in the Abbey so that one can scarcely even see it." Maria Mitchell, America's first woman astronomer, has also left us a description of the statue:

The base of Newton's monument is of white marble, a solid mass large enough to support a coffin; upon that a sarcophagus rests. The remains are not enclosed within. As I stepped aside I found I had been standing upon a slab marked 'Isaac Newton', beneath which the great man's remains lie.

On the side of the sarcophagus is a white marble slab, with figures in bas-relief. One of these imaginary beings appears to be weighing the planets on a steel-yard. They hang like peas! Another has a pair of bellows and is blowing a fire. A third is tending a plant.

On this sarcophagus reclines a figure of Newton, of full size. He leans his right arm upon four thick volumes, probably 'The Principia', and he points his left hand to a globe above his head on which the goddess Urania sits; she leans upon another large book.

Newton's head is very fine, and is probably a portrait. The left hand, which is raised, has lost two fingers. I thought at first that this had been the work of some 'undevout astronomer',

but when I came to 'read up' I found that at one time soldiers were quartered in the abbey, and probably one of them wanted a finger with which to crowd the tobacco into his pipe, and so broke off one.

The missing fingers offer an alternative to Westfall's Art-Critic Theory of the roping off of the monument.

The elements of the background of the 70 Ch stamp are these: A geometrical diagram from the proof of Proposition LXXI, Theorem XXXI, of the *Principia* is fairly faithfully reproduced: a capital "I" has been changed into a lower case "i". The proposition in question asserts that a particle external to a homogeneous spherical body can be taken to be attracted to the centre of the sphere. Behind this diagram are the title pages from the first editions of Newton's works. Clearly discernible are those of the *Opticks* (1687) and *Principia* (1704). Behind these are more title pages, and it is entirely possible that a Newton scholar can identify the two sticking out from behind the *Principia* by the single letters visible on them.

The sheets, as I said, offer no great additions. Each contains the 10 Ch stamp bearing Kneller's portrait. One also includes the 20 and 70 Ch stamps, while the other has the 30 and 50 Ch ones. The identical borders, in blue, have various line drawings, mostly devoted to space travel. The exceptions are another drawing of Newton's telescope, Woolsthorpe Manor seen from another perspective, and the title page of *Principia*.

At the time of writing, no *Michel* numbers are available for the stamps or sheets.

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The Latest Newton Stamp

Newton Checklist

Country	Year	Michel Number	Scott Number	Short Description
Ajman	1971	994 A,B	—	tiny cameo
Ascension	1971	142	142	Newton, telescope, apple
Ascension	1986	394	385	telescope; Halley's comet issue
Benin	1977	117	C276	portrait,
Bulgaria	1993	4079	3793	Newton medallion
Central Africa	1985	1188, 1189	780, 781	w. Halley; Halley's comet issue
Central Africa	1985	Bls. 359, 360	—	contain stamps 1188, 1189, respectively
Chad	1983	961	440B	partly gold foil; issued only in Bl. 151
Chad	1983	Bl. 151	—	contains stamp 961
Congo (pop)	1977	588	C238	portrait,
Dubai	1971	398	C57	portrait
England	1987	1101-1104	1172 - 1175	misc.
England	1990	1297	1337	telescope, gravity; from astronomy set
Fiji	1986	545	551	telescope; Halley's comet issue
France	1957	1171	861	portrait
Ghana	1987	1158	1031	Wedgewood plate; Halley's comet issue
Ghana	1989	1276	1130	stamp 1158 w. new value
Ghana	1989	1280	1128c	stamp 1276 w. official overprint
Grenada	1987	1687	1535	portrait, apple
Grenada	1989	1974	B14	w. Halley & Principia
Grenada/Grenadines	1987	914	C1509	medallion
Grenada/Grenadines	1993	1711	1539	telescope
Guinea	1986	1110	988	w. Halley; Halley's comet issue
Guinea	1986	Bl. 212	990	in margin; Halley's comet issue
Guinea	1986	Bl. 217	—	contains stamp 1110
Guinea	1994	1483	—	portrait, satellite
Hungary	1977	3199	2485	portrait, tab
Laos	1984	770	581	cameo
Lesotho	1987	630	578	portrait, telescope
Madagascar	1992	—	1100b	portrait, telescope
Maldiv Islands	1988	1279	1268	portrait, prism

Newton Checklist

Mali	1977	570	C301	portrait, apple,
Mauritius	1986	622	626	telescope; Halley's comet issue
Mexico	1971	1336	C377	portrait
Monaco	1987	1837	1601	portrait, orbits (sun not at foci)
Mongolia	1977	1047 - 1055	951a - 951i	portrait; misc.
Nagaland	1973	—	—	telescope,
Netherlands	1988	1345	731	"World of William & Mary", prism
Nicaragua	1971	1614	878	Law of Gravity
Nicaragua	1985	2626	1489	Halley's comet issue
Nicaragua	1994	3295	—	portrait, telescope
Niger	1970	249, 267	C124, C141	cameo; 267 is overprinted 249
N. Korea	1993	—	—	portrait; misc.
N. Korea	1993	Bls. —	—	contain 3 stamps each
Paraguay	1965	1431, 1434	871, 874	portrait
Paraguay	1965	1439, 1442	—	imperf re-colourings of 1431, 1434
Poland	1959	1136	884	portrait
Redonda	1921	—	—	small oval portrait, Royal Society
Russia; Sov. Union	1987	5758	5601	portrait, tab
St. Pierre & Miq.	1974	501	C56	small portrait in Copernicus stamp
San Marino	1982	1253	1023	portrait
Staffa	1817	—	—	telescope
Togo	1986	1948, 1994	1365, 1409	w. Halley; 1994 is overprinted 1948;
Togo	1986	Bls. 286, 292	1365, 1409	Halley issue
Togo	1986	Bls. 286, 292	1365, 1409	Bl. 292 is overprinted 286
Uganda	1987	556	566	cameo, optics
Uruguay	1996	1198, 1188	180, 181	portrait
Vietnam	1986	1658	—	portrait; Halley's comet issue
W. Germany	1993	1646	1771	portrait, 2nd law
Yemen (Kingdom)	1969	863	—	portrait, telescope
Yemen Arab Republic	1969	909, 916	—	portrait, satellite; 916 is imperf 909