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*Allosaurus\_fragilis*

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*Sinraptor\_dongi*

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*Dromaeosaurus\_albertensis*

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Deinonychus\_antirrhopus

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000111000?0?0010000?000000000000101?0??00000?0?100000?000?000000000000000000000000?  
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Velociraptor\_mongoliensis

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Balaur\_bondoc

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Tsaagan\_mangas

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Bambiraptor\_feinbergorum

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Tianyuraptor\_ostromi

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Sinornithosaurus\_millenii

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*Microaptor\_zhaoianus*

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*Graciliraptor\_lujiatunensis*

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*Hesperonychus\_elizabethae*



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Buitreraptor\_gonzalozorum

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Neuquenraptor\_Unenlagia

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Austroraptor

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### Utahraptor

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### Adasaurus\_mongoliensis

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Sinornithoides\_youngi

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Mei\_long

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Jinfengopteryx\_elegans

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Anchiornis\_huxleyi

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Xiaotingia

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IGM\_100/1126

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IGM\_100/1323

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Archaeopteryx\_lithographica

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Confuciusornis\_sanctus

10010????????????1?000?00?0001??0?2?0?0?0?00?01??????000010000?10?0001?1????????0?????????  
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2000001101110?00??1100?10?0000?110?00000??1?00?0000?0?01?0?10100?00????????1??00?0??0000000??  
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10????????????0?????0001?000??0??0?00111?0?1?000?100?????0??0?1????????0??00?0??00?00?0?  
100000??0??1?0?0??0?0??0?00?????010?????0?????0?0000?0?0?????0?0?????0?0000100?0?0????  
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Jeholornis\_prima

10????0???????1??0??0??001?????????????????0?????????0000?1??00?00?1?1????????0????????  
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0101101003000000000?0?0?1000?00?010????1??000?1????0??0?0?0?0??12300?10010?????????????  
0????0?00000?00?000000100000?0??01??0000?00000?0?1000120001000?0010000?000?0000?  
00001000010110000?000000000000?00000?01000000001000001000?00000001100?????011?1110??1?1100?  
10?0000?110?00000????????0?0?????0????????????????????0?????????0?  
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00?0?0??100000?00??1?10??0?00?????00?????010?????0?????0??0?000?00??000?0??0?  
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Jixiangornis\_orientalis





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01?0??0????[01]??????2??20?1??01?????????????10?1??????1?0??1011?????0?000??  
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Patagopteryx\_deferrariisi

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1???0?????0?0?  
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Cathayornis

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[02]???????3?????2????4?????11?02?1031110?011?1300?0?0111?0?00?12000?201?1022?23??????1??0??  
[12]1[01]1?0?3000?0??00??0?1??0??0100??111?????????0??0?????2300[01]0?  
012????????????????????????????????0?????0??0111??0010?20??1??10110?101????010?01200010010110[01]?  
0102011110?[01]?1?????210120?11?01?0101011?0?000001???1?0?0?1[01]1?0?????????0?01110??????  
01??????01?????????0??110?00000? ??????0?0?0100?10100?000????????????0?????????0?  
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Pengornis\_houi

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Hesperornis

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1213110010??0?00?01?1?0000?000??00?2??1?1111????0??????10000??10?1?10?1121200110?1010??  
1110011100??00?0??1010121011000012?0?000100100?0??10?0??00011??0?????????0??0???  
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11??1?01?00000?0??????0?1?0100?0?0??00?0??0??0?0??0??0??0??0??0??0??0??0??0??0??0??  
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Baptornis

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Ichthyornis

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1213110??00?0?20????00??0?00??21????????0?0????????012300[12]0?11????????10[01]1?  
111011101001020??101?1200111?101[12]?211022010100001010?  
111101121101111001011011010000101[01]10112111123120110011?12001[01]0010?112110211110021111[12]2?  
100002?0?011?100?20??0110??1?00?00100?11?01?01????????????????????0?0?  
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0100?????0?00?0000?00????????000?0????00?000?0?01?0000?????0?00111?00100?0?10201??000???

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Iaceornis\_marshii

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Limenavis\_patagonica

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Lithornis

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2??????[67]?1????????????[12]??11000010311110011?13003??000210101?20200102??2102?????12?01000??  
11?12130100?????0?200?01?2010??0?  
0001111010110?11[01]1101?1111?01?10121012?0111[12]1211122110100?  
0101101111011210111100110001[12]1110000101010101111113130110[01]11102[01]0120110?



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Hongshanornis\_longicresta

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21[23]0100000000?000?01?1??????0?0????1?1?0??????????0????0000?1?300??  
012????????????????????000?????1????0????110??????01?0??11??0?10??21000111??110??2???  
0??????????1??2000?000100?0?0?000??????1??1100??[01]?00?2?0??1????????????????  
0100?11?001?11?????0?????????0?????????0?????????0?????????0?????????0?  
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Liaoningornis\_longidigitris

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Crypturellus\_undulatus

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1110111122100?01107?110??12?24??121?1101001031101101113003??001210001?202201120021023?23?12?  
01000100110121301?0??01000200001?20000200?0?001021???120??01?????0???  
00000103002112121[01]01000111110101100110111111110010101210101121121211112?  
10100021011010111112100111110110001201100001110101011111031401011111020?120110?  
11211020211002111122210010110?011?10102000001111110000??1100?10?01??  
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Gallus\_gallus

100???102?021002?2000010100?00?111?120021?0001?1000001???1?100100000000021101?1?????????  
101[01]1111221?0?01007?120??12?24??1[12]1?11012010311020011113003??00121111?2?2001120021023?23?  
12?0100011011??213010010001000200100?20100200?0?0??21???121??01???0?00??  
00000103001102121211112211011111111111011000110101112101011201112111121101000210111111112100  
111110110001201100001011101011111131401001211021?121111?112110202110021111322200111?00?  
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Crax\_pauxi

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1000111122100?111?7?120??12?24??121?11002010311121011113003??0002100?1?2?2001120021023?03?12?  
0100011011?12130100100010002001?1?20100200?0?0??21???121??01?????00??  
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Chirostenotes\_pergracilis

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12????1?12??0?????????????101?1?????????00?100021?00101022120201110?111[01]?01??100??00?

100000200000?000?0?1??20?0?000?0?00100????????????????????000?????[12]????10????????001????

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Avimimus\_portentosus

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Erlikosaurus\_andrewsi

?0012??2?0?1?1??1010011100?0001?100000100001000000000??11112100100000020001?

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Alxasaurus\_elsesitaiensis

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Neimongosaurus





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Therizinosaurus

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Haplocheirus

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0??0000000?0?0?0000?000?000?0??0?0????????????20000?000000010101?????100??000?00????????0??  
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00001?0?000000?0?01000000?0??11??0?0?01??01?0????000001000000??00??100?0000000000?000???  
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Alvarezsaurus\_calvoi



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Mononykus\_olecranus

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11102001????2?10?2?????1???1000?000200030210?02201100??1????1?201000?2?????3?0??  
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11100101111111101011?????010000000000?000?0000?000010000?000?10???????100?10100?0?01???1??

Shuvuuia\_deserti

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0210100111011212000030000001100000110000010000?00?00100000001?010?00000000?00010000000?  
101000?10000110?0111000?0[12]0???0100?0010000[01]0?0210?0?00?????20010?000?0101011?0?0001000?  
00100000?000?0?0?0000?0000?000?000?00?102000000000000?0000000?00100000?0000020?0001?01?  
1010001??????1110200?000?000?0?1?0000?0?00000?00000100?????0?00?001?0????0?????0?000?00?  
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Parvicursor

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Ceratomykus

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Linhenykus

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Ornithomimus\_edmonticus

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Archaeornithomimus\_asiatius

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Anserimimus\_planinychus

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Struthiomimus\_altus

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Gallimimus\_bullatus

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Garudimimus\_brevipes

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Pelecanimimus\_polydon

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Harpymimus\_okladnikovi

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Sinornithomimus

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Qiupalong

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Kinnareemimus

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Huaxiagnathus\_orientalis

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Sinosauropteryx\_prima

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Compsognathus\_longipes

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000100000000001100?00??0?0?0?00?0?0010001100000001?00000000?0?000?020000?0000?0?0?0?0?????  
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Juravenator\_starki



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Sinocalliopteryx

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Mirischia

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*Ornitholestes\_hermanni*

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*Coelurus\_fragilis*

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*Tanycolagreus*

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Tugulusaurus

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Zuolong

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Bicentaria

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Kileskus

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Guanlong

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Xiongguanlong



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Albertosaurus\_sarcophagus

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Gorgosaurus\_libratus

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Tyrannosaurus\_rex

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Tarbosaurus\_baatar

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Merchantville\_taxon

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