

Did Roger Bacon Have a Telescope?—Continued

examined under a magnifying glass, proved to be made up of a great number of short strokes of the pen. These short strokes were the short hand characters, and so, in what seemed to be a single letter, there might be concealed an entire sentence.

The "michiton olabadas" key at the end proved to be made up of such characters in part, and Dr. Newbold found that when fully deciphered, it gave a short Latin verse:

"Rogerus Bacon
Adiens coelum
Hilaris festum
Cum sanctis coenarit."

Or, in English:

"I, Roger Bacon,
Drawing nigh heaven,
Gladly would feast with
The saints at their banquet."

This might have been put there, Dr. Newbold suggested, as a mnemonic rhyme, to aid in remembering the key.

With such a complicated cipher, and with such juggling required to make it into plain language, it might be thought that any gibberish might be turned into something sensible, but that the result would be from the mind of the translator, and not in the original. Those who knew Dr. Newbold testify to his high moral character, so, of course, there is no suggestion of wilful deceit. But the subconscious mind of the translator might put meaning into it. There is evidence, however, that this is not the case, and that the

cipher methods as worked out by Dr. Newbold are actually correct.

In the French National Library, at Paris, there is a manuscript written by Bacon which is possibly the long-lost work that he sent to Pope Clement IV. It purports to be a medical treatise, but Dr. Newbold found that it was also in cipher and that, when deciphered, it contained some alchemical writings. The problems of alchemy, the art of changing baser metals into valuable ones, engaged the attention of many in the Middle Ages.

Part of the text which Dr. Newbold deciphered by the two-letter equivalent method that he had employed in the Voynich manuscript, proved to be a formula for preparing metallic copper. The method given is a most unusual one, one that modern chemists to whom he showed it had never heard. But Prof. Newbold's colleague in the chemistry department of the University of Pennsylvania, Prof. Hiram S. Lukens, tried it, and found that it actually worked. Since Prof. Newbold was not a chemist it is hardly possible that he could have thought, consciously or subconsciously, of this unusual method.

It is the illustrations that are most interesting, however for they together with the text accompanying them, when deciphered, may indicate that Bacon was possessed of optical aid in the form of powerful telescopes and microscopes, at least

three centuries before these instruments are supposed to have been invented.

One of these drawings is of a structure consisting of two concentric rings, and connected by spiral arms. In it are a number of stars, and a cipher inscription accompanies it.

The inscription was extremely difficult to translate, wrote Dr. Newbold, but his first attempts interpreted it as telling that the object was between "the navel of Pegasus, the girdle of Andromeda and the head of Cassiopeia," and that it was seen in a concave mirror. Of course, that was long before the days of modern methods of designating stars, and the usual way was like this, from parts of the imaginary constellation figures.

Now, it happens that in this part of the constellation of Andromeda there is a spiral nebula, one of the great group of celestial objects that have within the last few years been shown to be systems of stars. They are like the system of which the sun, the Milky Way, and all the stars that we can see are part, but far outside its confines. They all have a characteristically spiral structure, but in some it is much more evident than in others. The one in Andromeda is one of the largest and nearest of these. It can just be seen with the unaided eye on a dark night, and is the only one that can be seen without (*Turn to next page*)

Astronomical Meeting Here

Astronomy

The International Astronomical Union, at which astronomers from all parts of the world meet every three years, will be held in the United States in September, 1932. This decision was reached at the meeting in Holland. The meeting will be held in 1932 instead of 1931, when three years will have elapsed, in order to accommodate astronomers from other countries who wish to view the total eclipse of the sun that will be visible in New England and eastern Canada on the afternoon of August 31, 1932.

So far the place of meeting has not been determined. Sir Frank Dyson, British Astronomer Royal, who is in charge of the Greenwich Observatory, will preside over the American meeting.

Science News-Letter, September 1, 1928

Totems Showed Trades of Clan

Anthropology

An Indian belonged to the bear or beaver clan, not so much because of a mystic brotherly affinity with that particular wild creature, as because the animal was a simple symbol of the Indian's economic class. This new interpretation of the Indian clan system has won for Dr. E. A. Bates, of Cornell University, the award of the Tyler medal, which will be presented to him in London next April.

The beaver clan drew its name from the skillful carpenters of the animal world, because these Indians wished to be known as good home builders. The wolf was the group symbol of a hunting class of Indians. The bear was the farmer's symbol.

This explanation is further borne out by the return of the Berlin African Expedition. It has found that the elephant clan of the African tribes

originated similarly in the economic status of the people who dealt in transportation.

Dr. Bates will sail shortly for Europe, with the paradoxical aim of investigating there what the Indians contributed to American culture. In the attempts of scientists to reconstruct the dawn period of American history, it has been hard to distinguish what the Indians taught the white men, and what the white men taught the Indians.

Dr. Bates will trace the heritage of some of the oldest white families that came to this country, in the hope of finding out what customs of farming and housekeeping they would have brought to the new world. This will show more definitely what the typically Indian customs must have been.

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