

materially to the evidence that the deposits in the two regions were cotemporaneous, a fact hitherto suggested only by the common occurrence of the genus *Edaphosaurus* (*Naosaurus*).

It has been shown by me⁴ that North America was probably isolated from the Old World in Permo-Carboniferous time, at least for such forms as the Amphibia, and the suggestion arises of the great antiquity of the embolomeroous type permitting such a distribution, a suggestion borne out by Moodie's find of an embolomeroous form, *Spondylirpeton spinatum*, in the Mazon Creek beds of Illinois.

Further work suggested by the facts here stated is in progress.

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A SIMPLE METHOD OF INDICATING GEOGRAPHICAL DISTRIBUTION

IN a recent number of SCIENCE a method of showing geographical distribution is suggested.¹ All who have to work with these problems will agree that political boundaries are unsatisfactory in such work, and also that the system of geographic coordinates (parallels and meridians) is often too exact for the information in hand, and, moreover, does not give a very clear idea of the location to most readers. Although there are obvious disadvantages in the use of rectangular areas such as those suggested, it is probable that their advantages are even greater.

A modification of the boundaries suggested seems desirable from the point of view of uniformity among the sciences. After thorough discussion at several international geographic congresses the government surveys have undertaken the preparation of an international map of the world on a scale of 1 to 1,000,000. The quadrangle adopted for this map seems nearly if not quite as well suited for showing distribution as that suggested recently. If this quadrangle can be adopted there will be a single system of areas for the topographic map of the world and for the purpose of stating distribution, and this has the great advantage of simplicity. There is the further advantage

that the statement of the location in the new system will show directly what topographic sheets will give the actual physical environment of the species under discussion.

The quadrangle of the international map is 4 degrees of latitude by 6 degrees of longitude; these quadrangles are designated by a system of letters beginning at the equator and numbers beginning at longitude 180°. The surface of the earth is divided into zones bounded by parallels of latitude, each zone is 4 degrees wide and extends around the earth. Zone A extends from the equator to latitude 4°, zone B from latitude 4° to latitude 8°, and so on; there are separate sets of zones north and south of the equator, that north of the equator designated by the word "north" and that south of the equator by the word "south." There are also north polar and south polar sheets, each circular and 4 degrees in diameter. The quadrangles of each zone are numbered from longitude 180° eastward around the earth. Thus the two sheets of the international map already published for the United States are *Boston*, North K 19 (latitude 40° to 44° N., longitude 72° to 78° W.) and *San Francisco*, North J 10 (latitude 36° to 40° N., longitude 120° to 126° W.).

The only disadvantage of the international map quadrangle, when compared with the "merospheres" suggested by Adams, is their somewhat smaller size. This is slight when compared with the gain in uniformity secured by the use of the quadrangle already adopted for mapping the world. It is to be hoped that any system of dividing the surface of the earth into quadrangles will in the future be based on the international map.

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NEW JERSEY CETACEA

APROPOS of Mr. Fowler's note in the August 13, 1915, issue of SCIENCE, I wish to add another New Jersey record for the dolphin, *Delphinus delphis*; early in May of this year I found a dead specimen on the beach at Sea

⁴ Publication 207, Carnegie Institution.

¹ Adams, J., "A Simple Method of Indicating Geographical Distribution," SCIENCE, N. S., Vol. 42, pp. 366-68, September 17, 1915.

Isle City, in Cape May County. Owing to decomposition the bones were not obtained then, and on later visit to the locality the specimen could not be found.

In addition to the above species I have secured since 1908 the following cetaceans at or near Sea Isle City; these are now in the collections of the Academy of Natural Sciences of Philadelphia: *Globicephala brachyptera* Cope, *Kogia breviceps* DeB., *Mesoplodon densirostris* DeB., and *Tursiops truncatus* Mont.

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Note.—Since the above was written one of the fish-pound crews at Sea Isle City brought in on September 25, 1915, seven live specimens of *Delphinus delphis*.

THE FUR SEAL REPORT

TO THE EDITOR OF SCIENCE: At pages 41, 44 and 57 of the fur seal report of Messrs. Osgood, Preble and Parker for 1914, Senate Document No. 980, recently published, occur important statistical tables giving enumerations of the different classes of seals for 1912, 1913 and 1914, conclusions and inferences from which affect vitally the report as a whole. The source of the figures for 1912 and 1913, which could only have been obtained from the field notes and unpublished reports of the writer now in the hands of the commissioner of fisheries at Washington, is not indicated and in the paragraph of general acknowledgment at page 17 credit to former workers is limited to "printed reports."

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November 19, 1915

ROGER BACON AND GUNPOWDER

IN his paper "Roger Bacon and Gunpowder" contributed to the "Roger Bacon Commemoration Essays" (edited by A. G. Little, Oxford, 1914), Colonel Hime tries to prove Roger Bacon the inventor of gunpowder by the method employed to prove Francis Bacon the author of Shakespeare's plays—a cipher. Since other contributors to the same volume refer favorably to this effort (Mr. A. G. Little, p. 395, calls it an "ingenious

explanation" and Mr. Patterson Muir, p. 301, says that "Colonel Hime establishes a large probability" in its favor), it may be well to note some points against it quite apart from the merits of the cipher itself.

In the first place, the cipher is based upon chapters of the "Epistola de secretis operibus naturæ et de nullitate magiæ" not found in the early manuscript of that work and considered doubtful by Charles in his work on Roger Bacon. Indeed, the opening phrases of two chapters, "Transactis annis Arabum sexcentis et duobus," and "Annis Arabum 630 transactis" suggest their source.

Secondly. Roger Bacon openly alludes to gunpowder in 1267 in his "Opus Tertium" as already in common use in children's toy explosives. Therefore Colonel Hime has to date the "De secretis" at 1248, and to hold that Bacon was at that time "driven to employ cryptic methods by fear of the Inquisition" (p. 334), but that by 1267

circumstances had totally changed in the lapse of years; the composition of gunpowder . . . had been divulged, and the first use made of the deadly mixture was for the amusement of children (p. 321).

But is there any good reason for dating the "De secretis" in 1248? Much of it sounds like a brief popular compilation from Bacon's three works of 1267-8 concocted by some one else later; compare, for instance, the first paragraph of the sixth chapter of the "De secretis" with Duhem, "Un fragment inédit de l'Opus Tertium," pp. 153-4 and Little, "Part of the Opus Tertium," 50-51. The dedication of the "De secretis" to William, Bishop of Paris, who died in 1249, occurs first in the late edition of 1618 and has not been found by Little in any manuscript.

Then the inquisition bug-a-boo is negligible. Has any one ever shown that the inquisition punished a practical invention? It was not for having invented the telescope that Galileo was persecuted. Moreover, Galileo's was an exceptional case, and it can not be shown that in the thirteenth century the church persecuted men of science. Rather, popes and prelates were their patrons.