man found it to exist. Professor Bischoff, however, mentions finding the uvula in the Orang.

The stomach of the Orang is not so human in its form as that of either the Gorilla or the Chimpanzee. Nothing peculiar was noticed about the spleen or pancreas.

The quadrate lobe of the liver was absent. In the small intestine five fine specimens of the *Ascaris lumbricoides*, and one in the large, were found, and in the cæcum a *Trichocephalus dispar*, perhaps the first time these entozoa have been found in the same anthropoid. Dr. Chapman did not notice anything special about the heart different from the human.

The brain was examined and described, but as the researches of Dr. Spitzka in this direction have been published in "SCIENCE," we need not here state the peculiarities which exist.

Dr. Chapman draws the following general conclusions respecting what can be inferred from the general organization of the Orang as to its relation to the primates.

The Orang, like man, has twelve ribs, whereas the Gorilla and Chimpanzee have thirteen; on the other hand the carpal and tarsal bones are nine in number in the Orang, while the Chimpanzee and Gorilla agree with man in having eight. The Chimpanzee and man are alike in this respect, at least the slip from the flexor longus digitorum in the former is functionally a flexor longus. In the absence of a flexor longus hallucis, and in the presence of an opponens hallucis, the Orang differs from man, the anthropoids and all monkeys. The great blood vessels arise from the arch of the aorta in the Gorilla and man in the same way; the same disposition is usually seen in the chimpanzee, rarely in the Orang. The lungs in the Orang are not divided into lobes as in the Gorilla, Chimpanzee and man. The stomach in the Gorilla and Chimpanzee is human in its form; in the Orang, however, it is quite different. The peritoneum in the Gorilla, Chimpanzee and Orang is like that of man; in the lower monkeys it is different. The brain of the Orang in its globular form, in the cerebellum being usually covered by the cerebum, and in the development of the first occipital gyrus, resembles man more than that of the Gorilla and Chimpanzee. On the other hand, the frontal and temporal lobes in the Orang are not as much convoluted as in the chimpanzee, and still less than in man, and the Island of Reil is not convoluted at all, at least in the Orang here described. It will be seen that from the above illustrations, of which many others might be given, that the gorilla and man, in some respects, agree with and differ from the Chimpanzee and Orang, while from other points of view the Orang approaches man more closely than either the Gorilla or Chimpanzee, and that as regards certain muscles, man and the lower monkeys agree in having them, while they are absent in the anthropoids.

From these facts we may reasonably infer that the ancestral form of man was intermediate in character as compared with the living anthropoids or lower monkeys, agreeing with them in some respects, and differing from them in others. The Orang is closely allied to the Gibbons, the Cnimpanzee to the Macaques, and the gap between these and the *Semnopithecus* is bridged over by the *Mesopithecus* of Gaudry. Until, however, the paleontologist will have procured more material like that from Pikermi, and interpreted it as ably, it seems to Dr Chapman premature to offer any detailed genealogical tree of the Primates.

Mr. A. D. Anderson, author of "The Silver Country or The Great South-West," has prepared a brief narrative of all efforts since the time of Cortez to effect interoceanic transit across the Isthmus of Tehuantepec. The book will be published at once by Messrs. A, S, Barnes & Co., of New York,

ON THE ORIGIN OF ANTHRACITE.*

BY T. STERRY HUNT, LL.D., F.R.S.

From my comparative studies of carbonaceous minerals I, as long ago as 1861, reached the conclusion that petroleum and anthracite form the extremes of a series, all of which may have been derived from organic matters, by natural processes at ordinary temperatures.†

To this is opposed the ordinary view that anthracite, on the one hand, and petroleum on the other, result from the action of heat on matters of intermediate composition, the one being a distillate and the other a residuum. Late geological studies, however, show that such an hypothesis is untenable for petroleum, and the author, while not denying that a local coking of bituminous coals must naturally result from the proximity of igneous rocks, has long taught that it is equally so for our anthracite fields. The prevalent notion has hitherto been that the difference between these and the bituminous coals farther West is in some way connected with the mechanical disturbance of the strata in the former region; but to this is opposed the fact that, while the undisturbed coals of Arkansas are anthracite, the highly disturbed coals of northeastern America, Belgium, and other regions are bituminous.

These considerations I have for many years presented to my classes in Geology, and have maintained that the change which results in the conversion of organic matters into anthracite was effected before the disturbance of the strata; that the hydrogen was removed, as ordinary vegetable decay, in the forms of water and marsh-gas; and that differences in aeration during the process of change and consolidation of the carboniferous vegetation are adequate to explain the chemical differences between anthracite and bituminous coals.

Prof. J. V. Lesley, to whom I have explained my views, has pointed out that there is an apparent connection in the great Appalachian coal-basin, between the more or less arenaceous and permeable nature of the enclosing sediments and the more or less complete anthracitic character of the coal, while Principal Dawson informs me that he has observed similar facts in the coal-measures of northeastern America. Inquiries which promise to throw farther light on this question are in progress, and the present note to the Academy is to be considered as only preliminary to a farther discussion of the subject.

NIMRAVIDÆ AND MIOCENE CANIDAE.*

PROF. EDWARD D. COPE.

The *Nimravidæ* is a new group resembling the cats, but differing from them in the presence of six pairs of foramina which are characteristic of other families of *Carnivora*. They are older than the *Felidæ* occuring in Miocene formations commencing with the lowest horizons. Some of the species are supposed to occur in the upper Eocene. The family includes the primitive cats, the false sabre-tooths, and the primitive sabre-tooths, which correspond respectively with the true cats, and the true sabre-tooths, forming heterologous terms of two homologous divisions.

The genera of Miocene *Canidæ* in North America are *Amphicyon Tennocyon*, and *Galecynus*, all distinguished by the presence of the epitrochlean foramen. Other genera are *Enhydrocyon* and *Ieticyon*.

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* Read before the National Academy of Sciences, N. Y., 1880.

†Canadian Naturalist, July, 1861, and Report Smithsonian Institution for 1862; also Chem. and Geol. Essays.