least one prominent authority thinks that this man had quite as much gray matter as the average modern man.

Another striking thing to be seen at the back of the skull is the evidence (in the size of the ridges and the contrasting deep impressions), of the tremendous and powerful mass of neck muscles the creature must have had. This is one of the points upon which is based the opinion that the skull is the most primitive yet found.

But to get back to the face! Dr. Smith-Woodward pointed out the fact that the suture of the nasal with the frontal bone is in a straight line rather than at a definite angle as in the apes; he also called attention to the small tubercle of bone in the mid-line of the nasal fossa which he says is distinctly a human trait. The zygomatic process is small. All of the bone of the face below the orbit is relatively undeveloped, but the *length* from the floor of the orbit to the alveolar border of the maxilla is phenomenal, as is also the length from the floor of the nasal cavity to the alveolar border of the maxilla. The palate is beautifully arched, and the teeth form a perfect horseshoe at its border. The wisdom tooth is reduced in size—another point in common with modern man and never found before in a fossil skull.

Unfortunately, the mandible was not found; the closest approach that could be found in the British Museum to the type this man had, was the Heidelberg jaw, but it is a bit too short and too narrow, though the ramus is too broad.

Another thing that has shocked the anthropologists is the unmistakable evidence of dental caries, and even of abscesses at the roots of the teeth. Now I guess we will have to lift the blame for caries off the shoulders of modern civilization. Won't we?

In contrast to the Neanderthal man who is supposed to have walked in a crouching position (because of the rather curved femur and other bits of evidence), this man is believed to have maintained the upright position, because the femur is relatively straight and when fitted to the tibia (which was also found) presents a perfectly good, straight leg.

But it would be altogether foolish for me to attempt any speculation on what I've seen! Of course, the scientific world here is much excited and many of its members are in danger of letting their imagination run away with them, but Dr. Eliot Smith at least is quoted as leaning to the belief that further study will reveal the fact that "the missing link" in the ancestry of man is represented in this individual—referring, of course to European man. The Neanderthal man would then represent a branch off of the main ancestral tree.

SPECIAL ARTICLES

A PRELIMINARY ATTEMPT TO TRANSMUTE LITHIUM

IF an electron could be introduced into the nucleus of a lithium atom, a nucleus would be obtained which would possess the same resultant charge as a helium nucleus; if two electrons were introduced the nucleus that resulted would have the same charge as a hydrogen nucleus. Both of these products are gases the spectroscopic tests for which are of exceeding delicacy. It consequently does not appear entirely futile to subject lithium to bombardment by a stream of electrons traveling with a high velocity in the hope of causing some of them to penetrate the lithium nucleus. Experiments to this end were undertaken by the writer three years ago in the laboratory of Inorganic Chemistry of the Department of Chemistry, Cornell University. At that time it was hoped to be able to pursue the subject further with more powerful apparatus; that possibility now seems far distant so that it may not be amiss to record briefly the results of the preliminary experiments then made.

The experiment consisted essentially of bombarding either metallic lithium or some salt of lithium with as powerful as possible a stream of electrons, absorbing all of the gases present after the bombardment except hydrogen and helium, compressing this unabsorbed residue into a capillary Plücker tube and examining it spectroscopically. Such a procedure introduced many serious experimental difficulties. In the first place if metallic lithium was used, it is so readily volatile that

it could not be subjected to more than momentary bombardments. If, on the other hand, a salt of lithium was employed, it evolved gas rather copiously so that these experiments likewise had to be intermittent. At the time these experiments were made the writer did not have at his disposal either an alkaline earth oxide electrode nor a tungsten spiral to serve as source of electrons. As a consequence the pressure of gas in the bombardment tube had to be maintained within rather narrow limits. The procedure finally adopted as most satisfactory under the existing conditions consisted in introducing the requisite amount of oxygen gas into the thoroughly evacuated tube containing the lithium, which was present as oxide, and subsequently absorbing the oxygen in heated copper. Small quantities of other gases found to be present were absorbed by suitable reagents. The voltage then available, which was obtained from a very large spark coil, probably did not exceed 150,000 volts. With a bombardment chamber so designed that metallic lithium could be cooled by liquid air, or other refrigerant, while being subjected to a less concentrated beam of electrons from a tungsten filament electrode, it is probable that the bombardment could proceed indefinitely.

As a result of these bombardments a small unabsorbed residue showing strongly the spectrum of hydrogen always remained. Because of the excessive difficulty of removing last traces of water vapor from the surface of glass, there is no good reason for supposing that the hydrogen came from another source than water liberated and decomposed as a result of the bombardment. On the other hand it must be remarked that in view of the well known masking effect which hydrogen possesses over the development of the spectrum of helium, small quantities of helium that might have been present would not have been detected. Means were not at hand for entirely separating this hydrogen from any helium and searching for the latter by itself.

The purpose of this discussion is to suggest that with improved and more powerful apparatus there would be considerable hope of pursuing them to some sort of a definite conclusion.

For much advice in its design and for blowing many of the more difficult parts of the glassware of this apparatus, the writer was under great obligation to Dr. Harold S. Booth.

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THE EFFECT OF SODIUM HYDRATE UPON THE DIGESTIBILITY OF GRAIN HULLS

NUMEROUS experiments have been made during the last few years, particularly by German investigators, in attempts by various treatments to render more digestible the straws of the different cereals, legumes and cruciferæ. Among the methods employed for this purpose may be mentioned (*a*) the heating of finely ground straws under atmospheric pressure, (*b*) the treating of the fine straw with 3½ and 7 per cent. of sodium hydrate under 5 atmospheres, (*c*) cooking the straw in open kettles or cement ovens with 8 per cent. sodium hydrate for 12 hours, and (*d*) the treating of ground straw with cold sodium hydrate of various strengths for different lengths of time. The action of sodium hydrate as well as of calcium hydrate has proved effective, and the

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	DRY MATTER	ASH	CRUDE PROTEIN	FIBER	EXTRACT MATTER	FAT
Oat hulls untreated	36	00.00	0.00	53	34	0.00
Oat hulls treated	81	65	0.00	91	79	0.00
Rice hulls untreated*	5	10	0.00	12	5	0.00
Rice hulls treated	29	?	0.00	28	38	0.00

*One sheep only.