Cambridge Examinations leads me erroneously to think that the proofs are expected to be given in the same order. In drawing this personal statement to a close, I may say that I am not singular in the view I took, as I learn from several gentlemen who have spoken to me on the point, and indeed, had it not been that the authorities* of University College School thought I had some ground for my views, I should have kept silence altogether. I believe the matter will come under the consideration of the proper authorities, and in their hands I am perfectly willing to leave the settlement of the question, if there be any need for a change.

R. TUCKER

University College School

### Science and the University of Cambridge

ONE of the last sentences in your paragraph concerning the report of the Syndicate for providing better opportunities for the study of physical science in the University of Cambridge, though founded upon a partial misconception of the state of affairs, suggests what is probably the best solution of the difficulty. The colleges, if polled upon the simple question, "Shall we aid in promoting the study of physical science?" would, I believe, reply by a considerable majority in the affirmative. It is upon the best mode of contributing that there is so much division of opinion; and this has caused the apparently "lame and impotent conclusion."

The question of taxing the college revenues is one of considerable difficulty; some colleges already support out of their corporate funds teachers of natural science, some have recently taxed themselves heavily to improve their buildings.

Most would think that non-resident fellows who do little for the college should be taxed more heavily than those who reside to do much work for no great amount of pay; but to bring about this would require much alteration of statutes. The question, therefore, being so complicated, and there being, as I believe, a general willingness to contribute, if only a just and equitable mode of raising the funds can be devised, and proper control retained over them (for the University is not generally considered to manage its property so well as the colleges), I believe that the difficulties would be most simply solved by the appointment of a commission composed of a few well-qualified persons, thoroughly acquainted with the University, to devise a scheme and to draw up an act for carrying it into effect.

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## EXPLORATION OF CAVES AT SETTLE, YORKSHIRE

IN the mountain limestone of the West Riding are many caves, some of which are empty, some traversed by water, which is silting up their lower chambers, while others are full up to the very roof with débris of various kinds. All have been, at some time or other, subterranean watercourses, and have been formed, partly by the friction of the substances set in motion by the current, but principally by the chemical action of the carbonic acid of the rain-water by which the insoluble carbonate of lime in the rock is converted into the soluble bicarbonate. Some have been inhabited, at various times, by man, and by wild beasts, and therefore may be expected to furnish valuable evidence of a condition of things that has now passed away. The last recorded case of their being used by man as a place of refuge was during the rebellion of 1745, when the eldest son of one of the gentlemen in the neighbourhood was hidden in a large cave, in the fear that the Scotch would pass southwards in that direction instead of by the Preston route.

The gentlemen of the West Riding have formed a committee for the systematic exploration of these caves, and will doubtless obtain from them evidence of the very highest archæological value, relating to a time of which we know next to nothing,—that begins with the disappearance of the mammoth, hyæna, and lion from Northern Europe, and extends as far down as the dawn of history in Britain, during which the neolithic and bronze-using races spread over Europe from the south-east. The older caves have been explored in many parts of Britain, while the pre-historic of the later have only been systematically examined in Somersetshire and Denbighshire by myself and Mr. Sanford. That the work in Yorkshire is planned well is clear from the following extracts from the Resolutions:—

That the following scheme, proposed by Sir James Kay-Shuttleworth (chairman), be adopted, viz.:—

1. To examine the ground around the mouth of the caves for signs of fire, implements, utensils, remnants of food, or traces of sepulture.
2. To make a survey of the caves in order to provide a plan of the interior drawn to scale, and of a sufficient size to enable a record to be made on it of the situation in which each thing is found.
3. To ascertain by one or more vertical excavations of limited extent what are the deposits chronologically arranged.
4. Then to proceed to examine these strata from the mouth of the cave inwards, so as to secure the discovery of all remains throwing any light on the history of each stratum.
5. To keep a record of the things discovered.

The first cave chosen by the committee is that found by Mr. Jackson, high up in a limestone cliff near Settle, on the coronation-day of our Queen, and which is therefore known as "the Victoria cave." It consists of a series of large chambers and passages, which are nearly filled to the roof with a reddish grey clay and stones. It must at one time have been of wonderful beauty, for there are the remains of massive stalactites, and of thick stalagmitic pavements; but now these are so decomposed by the carbonic acid that they are reduced to the condition of very soft mortar. Curiosity-hunters have also been doing their usual ruthless mischief. When it was first opened, Mr. Jackson obtained from a chamber at the original entrance a large series of ornaments and implements of bronze, iron, and bone, along with pottery and remains of animals. There are in his collection bronze fibulæ, iron spear-heads, iron nails, bone spoons, spindle whorls of stone and pottery, fragments of Samian ware, and other pottery turned in a lathe, cockle-shells, flint flakes, whetstones and stone balls. The remains found with these belong to the red deer, roebuck, pig, horse, and Celtic short-horn (*Bos longifrons*), sheep or goat, badger, fox, otter, and dog. There are also Roman coins of bronze and silver. All these were derived from a superficial deposit, and could not be assigned to an earlier date than that of the Roman occupation. The pottery was of the same kind as that so commonly found in the refuse heaps near Roman villas. It is worthy of note that the two domestic animals, the Celtic short-horn and the sheep or goat, were those that had been most abundantly used for food. The exploration committee resolved to follow up this discovery by a thorough examination of the cave, which they are able to undertake by the courteous permission of the owner, Mr. Stackhouse.

Outside the entrance of the cave, and at a lower level, is a small plateau composed of *débris*, which occupies the exact point where daylight could be seen through chinks, from the inside of one of the large chambers. As both the plateau and the chamber were undisturbed, the committee determined to begin work by removing the *débris* and making a new entrance into the cave. While this was being done, the following section was exposed. On the surface there was a layer of fragments of limestone that had fallen from the cliff above, two feet in thickness. Underneath was a layer of dark earth with stones about eighteen inches in thickness. It furnished large quantities of bones, nearly all of which had been used for food, and several articles of bronze, iron, or bone of the same kind and age as those I have already mentioned. The pottery is also of the same Roman character. Fragments of charcoal were also abundant, and stones bearing the

* What strong views in favour of the modern methods are held by Prof. Key, may be seen from Prof. Hirst's preface to our Geometry.