field is it unpaid; nor is it ever worth much if not paid for. It has hitherto been too much the custom to treat men of science as exceptions to all other professions; to assume that whilst it is quite proper to enrich and ennoble soldiers who fight for pay, lawyers who evade or apply the law according to circumstances; physicians who kill or cure as seemeth best to them; and even divines, whose mission to save souls might be deemed a sufficient privilege: the man of science who contrives the arms with which the soldier wins his fortune and his coronet, who surrounds the lawyer, the physician, and the divine with the luxuries which their superior privileges enable them to command, should work for love, and die, as he too often does, in poverty.

If the Council, the creation of which I now advocate, does its duty, it will confer benefits untold on every member of the community, from highest to lowest; from the military and naval appliances necessary to protect our unequalled national wealth, down to the smallest and least regarded necessaries of our ordinary life, the influence of this Council will be felt; and is it either just or wise to expect such benefits for nothing? . . . .

[The author then gives some indication of the mode of constituting the Council.]

IV. *What objections can be alleged against the proposed Council?*—Difficulties innumerable can of course be conjured up in this as in every case of reform, but I have only heard three definite objections raised that seem to me to deserve any notice. They are:—

1st. That this is a system of centralisation, and therefore objectionable.

2nd. That it will be liable to jobbery.

3rd. That it will be too costly.

I will touch on each of these briefly.

As to centralisation, I admit the impeachment, but claim it as an advantage, not an evil. Those who are scared by centralisation forget that it constitutes the very basis of civilisation and of stable efficient government. In primitive savage life there is no centralisation, no united effort for a common purpose. Each individual struggles single-handed for his rights. Civilisation teaches us to set apart certain members of the community for purposes beneficial to the whole, to form them into distinct bodies, having definite duties to be executed, under the direction of a head central authority. The army, the navy, the police, the post-office, are examples of such bodies, the animating and ruling law of which is centralisation. In the case of the police, we have local, in the other cases imperial, centralisation. The body we are considering will have to perform duties of a strictly imperial character, contributing directly to the efficiency of the defensive power of the empire, and to the security and well-being of every member of the community. It is a body which not only would not be effective, but which could not exist but in a centralised form.

As to the second objection, that the arrangement I have proposed would be liable to jobbery, I must own that, as I contemplate the employment of human beings only, I do certainly expect to see the operation of human motives. But if jobbery be a fatal objection to the scheme, then on the same principle we ought to have no army, navy, church, bench, magistracy, municipalities, or Parliament, for in each of these the discovery of some traces of jobbery will probably reward a diligent scrutiny. It is not apparent why a degree of purity not dreamt of in regard to any other profession should be insisted on when science is in question; nor is it clear why men of science should, *a priori*, be deemed more corrupt than their neighbours. Of course every precaution should be taken against corruption in so important a body, and the rest must be left to that sense of honour to be found in all other professions, and of which even men of science are perhaps not entirely devoid.

The third objection, undue costliness, is, in my opinion, as invalid as the other two. My proposal has two main objects—to increase efficiency, and to diminish blunders. Both are in the strictest sense economical objects. If it does not seem calculated to attain these objects, it should on no account be adopted. If it gives satisfactory promise of their attainment, no expenditure that it is likely to occasion will be too great in order to secure them. Let any one who is terrified by the cost, visit our ports, dockyards, and arsenals, and there see the ships that have been built which should not have been built, the cannons made that should never have existed, and the useless arms and equipments of the pre-scientific ages. Let him count the cost of these, and compare it with the probable cost of substituting for the reign of haphazard ignorance a reign of systematic intelligence. To take one example—that of Her Majesty's ship *Captain*. This vessel, with her armament and stores, probably cost the nation three or four hundred thousand pounds. Who shall assess in money the value of the 500 noble lives that perished with her? Would not the nation willingly give a million to have them back? If so, we have as the cost of one single blunder committed by one Department something like a million and a half of money, a sum that would go a long way to permanently endow a body which, had it existed a year ago, must have prevented that blunder. But if I dwelt on the preservation, prolongation, and increased comfort of civil life which such a Council would tend materially to secure, the cost of its maintenance would appear absolutely insignificant in comparison with the blessings it would shower on the nation. Against the cry of costliness I oppose the assertion, easily established, that nothing is so ruinous as disregard of the laws of nature, and nothing so profitable as intelligent obedience to them. Science, looked at in the dryest commercial spirit, must, in the long run, *pay*.

I must guard myself against the supposition that the proposal I have here advocated comprises all that is necessary for the efficient administration of scientific State affairs. It is only one part of a great system that has to be created. Other parts of the system will, no doubt, receive due attention from the Royal Commission now considering them. But there is one part so important that I feel called on to name it; I mean the appointment of a Minister of Science. He need not necessarily be exclusively devoted to science; he might, perhaps, with advantage, have charge of education and the fine arts also; but some one in Parliament directly representing the scientific branches of the national services has become absolutely indispensable. . . .

When we have all Scientific National Institutions under one Minister of State, advised by a permanent, independent, and highly qualified consultative body—when we have a similar body to advise the Ministers of War and Marine in strategical science—then the fact that, in accordance with our marvellous constitution, these Ministers must almost necessarily be men without pretension to a knowledge of the affairs which they administer, need cause us no alarm. When these combinations have been, as they assuredly will be, sooner or later, effected, the wealth, resources, and intelligence of the nation, having due scope, will render us unapproachable in the arts of peace, and unconquerable in war—but not till then.

In conclusion, I must claim for the proposal I have advocated that there is nothing revolutionary in its character.

I aim at creating no new principle. We have already, as an integral part of our administration, a body constituted on the very same principle as that now advocated. I allude to the Council of India. . . .

My proposal, therefore, I maintain aims at the creation of no new principle,—but only at the extension of one already existing, and universally approved after long experience. Nor do I aim at creating new labours. The work of which I have been speaking is now being done, or suppposed to be done, and it is paid for heavily by the nation, but it is not well done. I propose to improve its quality by improving the agency to which it is assigned. I propose to substitute concentration for scattered effort, system for chance, organisation for disorder. I propose neither to exact from the Queen's advisers new duties, nor to fix upon them new responsibilities. The end and aim of my proposal is to lighten their labours and anxieties by putting into their hands better arms than those with which they now vainly strive to uphold the power and glory of the nation.

A. STRANGE

SCIENTIFIC SERIALS

THE last part of the *Sitzungsberichte* of the Isis Natural History Society of Dresden contains the proceedings of the Society for the months of July, August, and September, 1870. In the section of Prehistoric Archæology, Dr. Mehwald described kitchen-middens on Zealand and Jutland, and on the Andaman Islands, and stated that M. Lorange of Fredrikshald, in Norway, has investigated a grave in that neighbourhood which he believes to have been a family grave, in which the bodies were deposited one above the other, the one first buried being probably at a depth of 600 to 700 feet.—Prof. Geinitz explained Delesse's Geological Map of the Department of the Seine, and remarked upon the occurrence in that district of the bones of extinct animals associated with artificial products and the remains of man. He also

glanced at the well-known phenomena of the same kind at St. Acheul and Schussenried, and gave a list of articles received by the Museum of Dresden from the pile-buildings of Robenhausen, in the Pfaffikon Lake. Prof. Geinitz also noticed the contents of some recent anthropological publications.—M. Klemm exhibited a ring of serpentine, measuring about two inches in diameter, found in the year 1835, in an urn in Lower Lusatia. —In the mineralogical and geological section, M. C. Bley noticed the occurrence of roestone in the neighbourhood of Bemburg, and ascribed the peculiar structure of the stone to the great amount of salt contained in the water from which the carbonate of lime for its formation was precipitated.—Prof. Geinitz referred to the discovery of a well-preserved molar of *Elephas primigenius* in the bed of the Elbe below Kötschenbroda, and also exhibited a great number of marly concretions and transported blocks from the loam pits between Strehlen and Mockritz. He also noticed some of the localities in which fossils are to be found in the Loess. M. H. Engelhardt communicated notices of some plants from the brown coal of Saxony, namely, *Anona cacaoides* Zenk. sp., *Gardenia pomaria* Schl. sp. (=*G. Wetzleri* Heer), *Livistona Geinitzi* n. sp., *Glyptostrobus europæus* Brongn. sp., and a species of *Carpolithes*.—Prof. Geinitz communicated a list of some corals from the Lower Pläner of Plauen, which had been determined by Dr. W. Bölsche; eleven species are enumerated of which six are indicated as new, namely, *Montlivaltia* (?) *tourtiensis*, *Thecosmilia* (?) *Geinitzi*, *Latimæandra*, *Fromentali*, *Psammohelia granulata*, *Thamnastræa tenuissima*, *Dimorphastræa Dunkani*, and *Astrocœnia tourtiensis*.—M. Engelhardt communicated a paper on the Loess in Saxony, in which he described the general nature and mode of occurrence of the deposit, and the special peculiarities presented by it in particular localities. In connection with this paper and the concretions from the Loess exhibited by Prof. Geinitz at a previous meeting, M. Klemm presented a memoir on concretions and on the globular forms occurring in the minerals and rocks.—Dr. O. Schneider noticed the minerals occurring in the granite of the Königshayner mountains, and in the Zechstein of Niederludwigsdorf near Görlitz, and described some crystals of zircon received from Haddam in Connecticut.—Prof. Geinitz reported upon some fossils from a sandy deposit of Cretaceous age at Château de Meauene near Angers. The predominant form is *Siphonia pyriformis* Goldf. Three species of *Palmacites* are noticed, and one of them is described as a new species under the name of *P. Boxbergæ*— In the mathematical, physical, and chemical section, the only paper of which particulars are given is a description by Prof. Klein of an apparatus invented by him to enable the magnetic needle to be employed on board of armour-plated ships. The arrangement consists of a compass placed at the mast-head and connected with an electro-magnetic apparatus, by which an index is moved.—In the Zoological Section Prof. Günther gave a short exposition of the comparative anatomy of the brain in mammalia. —M. Engelhardt exhibited some corals and shells obtained from Guano.—Dr. Ebert remarked upon Huxley's *Bathybius*.—M. C. F. Seidel described the excrescences and other deformities produced on the stalk of the common cabbage by a small weevil, *Baris cuprirostris*.—Dr. Ebert referred to the support afforded to the theory of the evolution of organic types by the discovery of the curious lizard, *Hatteria punctata*, upon the anatomy of which Dr. Günther has given us such interesting information. Dr. Ebert tabulates the characters of the orders of reptiles to show in what a singular manner *Hatteria* combines their peculiarities.— Dr. Schneider noticed the scorpions collected by him in Egypt.— Dr. Mehwald noticed the occurrence of a snake (*Coronella lævis*) and of a lizard (*L. agilis ?*) as far north as 62° and 63° in Norway; and M. Kirsch gave some account of experiments with vipers and the common snake. According to the latter the bite of a new-born viper, five inches long, killed a mouse in a short time; snakes killed by decapitation exhibit irritability by galvanism for a very much longer time than those destroyed by poison; and the common snake (*Tropidonotus natrix*) is the only snake indigenous to Bavaria that attacks frogs.—The Botanical Section received from M. C. Wilhelmi an account of those Australian plants which may furnish nourishment to man. The abstract of this paper here published enumerates a considerable number of plants, parts of which are used as food chiefly by the natives.— The rest of the communications to this section require no mention, except a report by M. F. A. Weber upon Hildebrand's work on the sexual relations of the Compositæ.—At one of the general meetings Prof. Hartig reported upon the applicability of various kinds of wood to the manufacture of paper.

SOCIETIES AND ACADEMIES

LONDON

Zoological Society, June 6.—Mr. G. Busk, vice-president, in the chair. Prof. Owen, F.R.S., read a paper on Dinornis, being the seventeenth of his series of communications on these extinct birds. The present paper gave a description of the sternum and pelvis, and an attempted restoration of the whole skeleton of *Aptornis defossor*.—Prof. Flower, F.R.S., gave a description of a specimen of the so-called Risso's Dolphin which had been taken in a mackerel-net near the Eddystone Lighthouse, and of a second specimen of the same dolphin subsequently purchased in Billingsgate Market. After a searching investigation of the history of this supposed species, Prof. Flower came to the conclusion that the differences usually held to separate it from the *Delphinus griseus* of Cuvier were untenable, and that the species should be correctly designated *Grampus griseus*.—A second paper was read by Prof. Flower on a specimen of the Ringed or Marbled Seal, which had been obtained on the coast of Norfolk, being the first certain instance of the occurrence of this seal in the British seas. To this was added some remarks on the difficult questions presented by the synonymy of this species, which, after full consideration, Prof. Flower came to the conclusion ought to be called *Phoca hispida*.—A paper was read by Prof. W. Peters, giving a description of the Bats collected by Mr. F. Day, in Burmah. The collection contained a very interesting new form of *Rhinolophi*, which Dr. Peters proposed to call *Phyllorhina trifida*.—A communication was read from Dr. A. Günther, F.R.S., containing the description of a new species of Teius (*Teius rufescens*) from Mendoza, founded on five specimens of this lizard living in the Society's Gardens.—Mr. A. G. Butler communicated a Monograph of the Lepidoptera hitherto included in the genus *Elymnias*.—A second communication was read from Mr. Butler, containing a revision of the species of Butterflies formerly included in the genus *Terias* (*Pierinæ*).—A paper by Dr. J. E. Gray was read, containing a reply to Mr. Theobald's observations on Dr. Gray's paper on the families and genera of Tortoises, printed in a recent part of the Society's "Proceedings."

Chemical Society, June 1.—Prof. Frankland, F.R.S., president, in the chair.—The following gentlemen were elected Fellows: H. Adrian, H. Durham, G. Martineau, E. Neison.— Dr. Debus, F.R.S., delivered a lecture "On Ozone." The first who had observed that the passage of electric sparks through oxygen brings about a change in the properties of this gas was Van Marum. The next to take up the subject was Schönbein, in 1840. He ascribed the peculiar odour and the more energetic oxidising properties of the altered oxygen to a substance which he termed ozone. He also found that ozone may be prepared by many other methods. His experiments, however, led to no positive results, as regards the nature of ozone. It was through the researches of Marignac and De la Rive that ozone was shown to be nothing but an allotropic modification of oxygen. Dr. Debus then discussed the question whether there existed another modification of oxygen, called antozone, and answered the proposition negatively—the substance called antozone was only peroxide of hydrogen. The lecturer concluded by calling special attention to one of the characteristic reactions of ozone, viz., the decomposition of potassic iodide, which reaction is differently explained by the various observers. Schönbein has shown that potassic iodide protects free iodine against the action of potassic hydrate. It may be assumed that potassic hydrates and an iodine solution react upon one another thus:

$$KHO + I_2 = KIO + HI, \text{ and then } KHO + HI = KI + H_2O;$$

if now an excess of potassic iodide be added, the potassic hypoiodite and potassic iodide produce again potassic oxide (which becomes in its turn a hydrate) and iodine, and the excess of iodide prevents the action of KHO on the iodine, but not that of the latter on starch.

Society of Biblical Archæology, June 6.—Mr. Samuel Birch, LL.D., F.S.A., president, in the chair. The following ladies and gentlemen were proposed by the council for ballot at the next meeting:—Rev. A. H. Sayce, Queen's College, Oxford, E. R. Hodges, late of Jerusalem, Mrs. J. W. Bosanquet, and Miss Dorothy Best, of Maidstone. Mr. George Smith (British Museum) read an elaborate and interesting paper "On the Early History of Babylonia." Commencing with a *résumé* of facts already ascertained by the labours of Sir Henry Rawlinson and