

THURSDAY, JUNE 14, 1877

THE ENDOWMENT OF RESEARCH

WE are authorised to publish the accompanying list of the sums to be paid by the Government, on the recommendation of the Royal Society, during the present year in aid of Scientific Research.

We might well leave the list to speak for itself, but it would be ungrateful not to point out that the Duke of Richmond and Lord Sandon have by their action, beyond all doubt, inaugurated a new era in the scientific activity of our country, and one which is sure to be fostered by corporate bodies and individuals now that the Government has set so noteworthy an example.

PERSONAL PAYMENTS.

- Mr. J. A. Broun.—For Correction of the Errors in the published Observations of the Colonial Magnetic Observatories 150l.
- Dr. Joule.—For Experimental Investigations into the Mechanical Equivalent of Heat 200l.
- Prof. Parker.—For Assistance in Researches on the Morphology of the Vertebrate Skeleton and the Relations of the Nervous to the Skeletal Structure, chiefly in the Head 300l.
- Rev. W. H. Dallinger.—For Microscopic Investigations of Monads, Bacteria, and other Low Forms of Life 100l.
- Rev. F. J. Blake.—For compiling and publishing a "Synopsis of the British Fossil Cephalopoda" 100l.
- Prof. A. H. Garrod.—For Aid in preparing for Publication an Exhaustive Treatise on the Anatomy of Birds 100l.
- Dr. Murie.—For completing and publishing three Memoirs:—"Anatomy of the Kingfisher," 4to., with five plates; on "Extinct Sirenia," 4to., with six plates; "Osteology of the Birds of Paradise," folio, three plates 150l.
- Mr. H. Woodward.—For Continuation of Work on the Fossil Crustacea, especially with reference to the Trilobita and other Extinct Forms, and their Publication in the Volumes of the Palæontographical Society 100l.
- Prof. Schorlemmer.—For Continuation of Researches into (1) the Normal Paraffins, (2) Suberone, (3) Aurin 200l.
- Dr. H. E. Armstrong.—For Continuation of Researches into the Phenol Series, and into the Effect of Nitric Acid on Metals 300l.
- Profs. King and Rowney.—For Researches to Determine the Structural, Chemical, and Mineralogical Characters of a Certain Group of Crystalline Rocks represented by Ophite 60l.
- Mr. W. J. Harrison.—Towards the Expense of collecting and describing Specimens of the Rocks of Charnwood Forest 50l.

NON-PERSONAL PAYMENTS.

In aid of Apparatus, Materials, and Assistance.

- Dr. J. Kerr.—For aid in Electro-Optic and Magneto-Optic Researches 200l.
- Mr. J. E. H. Gordon.—For Experimental Measurements of the Specific Inductive Capacity of Dielectrics 50l.
- Prof. Guthrie.—For Apparatus and Assistance in (1) the Determination of the Latent Heats of the Cryohydrates and the Vapour Tensions of Colloids; and (2) the Examination of Heat Spectra and Radiant Heat by means of varying Electrical Resistance in Thin Wires 150l.
- Mr. J. T. Bottomley.—To aid in carrying out a Series of Experiments for determining the Conductivity for Heat of Various Liquids and Solutions of Salts 100l.
- Sir William Thomson.—For Assistance and Materials

- for a Continuation of Experiments on the Effects of Stress in Magnetism 100l.
- Mr. W. Crookes.—For Assistance in continuing his Researches connected with "Repulsion resulting from Radiation" 300l.
- Messrs. Rücker and Thorpe.—For a Comparison of the Air and Mercurial Thermometers 50l.
- Mr. F. D. Brown.—For an Investigation of the Physical Properties, the Specific Gravity, Expansion by Heat, and Vapour Tension, of the Homologous and Isomeric Liquids of the C_nH_{2n+1} Series 100l.
- Prof. Roscoe.—For Continuation and Extension of the Experiments on the Self-registering Method of measuring the Chemical Action of Light 100l.
- Sir William Thomson.—For Investigation and Analysis of Tidal Observations and Periodic Changes of Sea Level 200l.
- Dr. J. B. Balfour.—For the Expense of Illustrations for a "Monograph of the Pandanaceæ" 50l.
- Mr. H. T. Stainton.—For Aid in publishing the "Zoological Record" 100l.
- Dr. J. G. M'Kendrick.—For Apparatus for a Research into the Respiration of Fishes 75l.
- Prof. Gamgee.—For a more Complete Survey than has yet been made of the Physiological Action of the Chemical Elements and their more Simple Compounds, with the Object, in the first instance, of establishing a Physiological Classification of the Elementary Bodies 50l.
- Dr. Brunton.—For Researches into the Physiological Action of the most important Compounds of Nitrogen, and into the Action of certain Poisons, and for Apparatus 80l.
- Mr. E. A. Schäfer.—To pay the Wages of an Assistant to give Mechanical Aid in Histological and Embryological Research 50l.
- Dr. Burdon Sanderson.—For an Investigation of the Normal Relation between the Activity of the Heat-producing Processes, and the Temperature of the Body 70l.
- Prof. Schorlemmer.—For continuation of Researches into (1) the Normal Paraffins, (2) Suberone, (3) Aurin 100l.
- Mr. W. N. Hartley.—For Researches into the Photographic Spectra of Organic Substances, into the Phosphates of Cerium, the Conditions under which Liquid Carbonic Acid is found in Rocks and Minerals, the Double Salts of Cobalt and Nickel, and for other Investigations, and for Assistance 100l.
- Dr. Burghardt.—For a Research into the Origin of the Ores of Copper and (if possible) of Lead, their Mode of Formation, and the Chemical connection (if any) between the Ore and its Matrix 50l.
- Prof. Church.—For a Research into the colouring matters of Colein, of Red Beet, and for the Study of Plant Chemistry 50l.

THE "CHALLENGER" COLLECTIONS

THE preliminary steps have been taken for the completion of the great work of the *Challenger*, and the vast collections made during the voyage are now being distributed among experienced workers for determination and description.

The director of the scientific staff has been at great pains in endeavouring to secure the services of men most competent for the task, and we are sorry to see that some of our English naturalists, and notably the president of the Geological Society, have thought it necessary to remonstrate against the course which the director has taken in the selection of the men to whom he is about to entrust the examination of the collections. We have already had occasion to refer to what we felt obliged to characterise as an unwarranted attack on Sir Wyville Thomson, and it is

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with much regret that we observe an attitude of hostility to the mode of distribution which has been deemed most conducive to the reputation of the expedition and to the interests of science.

It would seem that while almost all the great zoological groups which the *Challenger's* dredges have brought to light have been handed over for examination to naturalists in this country, a few have been placed in the hands of American and German workers; and it is this association of foreign zoologists with the men to whom in this country by far the largest portion of the work has been assigned that has excited the indignation of the individuals referred to.

Now every one who has kept himself *en rapport* with recent zoological research, must know that the foreign zoologists, to whom Sir C. Wyville Thomson has intrusted these collections, stand before all others in the amount and thoroughness of their work in the special departments of zoology for which their aid is asked, and the narrowest nationalism cannot deny that it was the duty of the director to see that the specimens were placed in the hands of men most competent to secure for science the results which have been obtained at the cost of so much labour, skill, and public expenditure.

If this country can be shown to enjoy the unique distinction of possessing in every department of zoological research men at least as good as can be met with elsewhere, the advocates of a national science may find an argument in favour of having the work absolutely confined to Englishmen; but if we cannot assume a position which no other nation in the world would think of claiming, it is plainly for the interests of science that we should supplement from abroad those departments of research in which foreign workers may excel us.

That the naturalists to whom we have referred will not receive much support from their fellow-workers will be evident from the subjoined letter to the Editors of the *Annals* now in process of signature, which has already received the adhesion of the presidents and secretaries of the Royal, Linnean, and Zoological Societies, and of other leading men in this department of knowledge:—

"Zoology of the 'Challenger' Expedition.

"As in a letter upon this subject in the number of the *Annals of Natural History* for May last Dr. P. Martin Duncan, writing as president of the Geological Society, has stated that he speaks 'at the instance of a very considerable number of members of learned societies,' we, the undersigned, wish to state that we do not agree in the strictures passed by Dr. Duncan upon the manner in which Sir C. Wyville Thomson has distributed the specimens collected by the *Challenger* Expedition for description. So far as we have had an opportunity of judging we are perfectly satisfied that Sir C. Wyville Thomson, in the arrangements which he has made as regards these collections, has acted consistently with the best interest of science.

"It was, in our opinion, Sir C. Wyville Thomson's duty to secure the aid of the most competent naturalists without regard to their nationality; and, even if it were proper that national jealousies should be imported into science, Sir C. Wyville Thomson can hardly be reproached on this score, when it is considered that two-thirds at least of the naturalists whose aid he has obtained are Englishmen.

J. D. HOOKER.	W. H. FLOWER.
T. H. HUXLEY.	P. L. SCLATER.
CHARLES DARWIN.	OSBERT SALVIN.
ST. GEORGE MIVART.	A. H. GARROD.
FRANCIS DAY.	GEO. A. ALLMAN.
GEO. BUSK.	TWEEDDALE."
WILLIAM B. CARPENTER.	

It is of importance that no misunderstanding should

exist as to the real state of the controversy which has arisen on a subject in which zoological science is so deeply interested, and we believe we cannot do better than lay before our readers the correspondence which had taken place between Sir Wyville Thomson and Dr. P. Martin Duncan before a word of hostile criticism had as yet shown itself in print.

"Scientific Club, Savile Row, London, W.
"24th March, 1877

"MY DEAR SIR WYVILLE THOMSON,

"You can hardly imagine the strong feeling of disappointment which has arisen amongst a very large section of the naturalists and palæontologists who study the invertebrates, in consequence of a letter which was published in the *Ann. and Mag. of Nat. Hist.* for March, 1877. In this letter the scientific world is informed by our mutual friend, A. Agassiz, that the Echini, Ophiurans, Radiolaria, and a part of the Spongida collected in the expedition of the *Challenger* have been given to American and German naturalists for description, and that the United States have a 'fair share' of the work. So great is the feeling that English workers should have been thus passed over, that a conference has been held on the subject, and I have been asked to write to you in the friendliest spirit of remonstrance. I need hardly state that I should not have taken this liberty did I not happen to hold a position which entails action in everything relating to the progress of geological science. Writing then on the part of many men whose capabilities as naturalists and palæontologists I am well aware of, I express their and my own opinion that in this distribution your amiability and want of personal acquaintance with English workers have led you astray. We recognise the great merits of those foreign gentlemen to whom you have sent collections and the exceeding liberality of A. Agassiz; but we do not think that you are justified in giving them the results of the greatest natural history expedition which has ever sailed from this country, unless there is a want of that power amongst English workers which will enable them to treat the subjects in the broadest sense, and to compare the recent and geological faunas satisfactorily. There is no such deficiency. I am asked to urge upon you a reconsideration of the matter, and to leave a fair portion of work in the hands of our friends, giving the rest to men of your own country. Assuring you that we appreciate your difficulties, and that we will assist you in every way consonant with the dignity of English science, I remain,

"Yours sincerely,
(Signed) "P. MARTIN DUNCAN

"SIR C. WYVILLE THOMSON"

"MY DEAR DR. MARTIN DUNCAN,

"I must ask you to consider this note as written to yourself personally, for I cannot, of course, in any way recognise this nameless 'Conference.' I may mention, however, at starting, that in this matter I have consulted several of the first English naturalists, and that they entirely approve of my selection.

"I take up my pen rather hopelessly, for your letter does not touch any of the considerations on which I have acted. My duty was to have prepared an official account of the voyage to the best of my power within a certain time. I endeavoured to select to assist me in this (1) those who had most successfully made certain branches their special study and were generally regarded as *authorities*; and (2) those whom I knew by experience to be likely to do the work within the time to which I was tied down, and to return the specimens in good order to be lodged in the British Museum. In all cases where I considered that these conditions were fairly fulfilled by Englishmen I at once and fully recognised the great advantage of avoiding the risk of sending things abroad, but except for this consideration I confess I saw and see no objection, but rather the reverse, to making a great work of this kind somewhat more catholic. The result has, however, been, that by far the greater part of the work will be done in England. I do not mean to go into special cases, but I give a general sketch of the arrangements as they now stand:—

Sea Mammals	...	...	Prof. Turner.
Birds	...	...	Dr. Sclater.
Fishes	...	...	Dr. Günther.
Cephalopoda	...	...	Prof. Huxley.
Gastropoda	...	...	} Rev. R. E. Watson.
Lamellibranchiata	...	...

Brachiopoda	Mr. Davidson.
Higher Crustacea	Probably Prof. Claus.
Ostracoda	} Prof. G. Brady.
Copepoda	
Isopoda	Mr. Henry Woodward.
Cirripedia	Mr. Darwin.
Annelida	Dr. McIntosh.
Gephyrea	Prof. Ray Lankester.
Bryozoa	Mr. Busk.
Echinoidea	Mr. A. Agassiz.
Ophiuridea	Mr. Lyman.
Crinoidea	Dr. Carpenter and myself.
Hydromedusæ	Prof. Allman.
Corals	Mr. Moseley.
Sponges	Prof. Oscar Schmidt and myself
Rhizopods	Mr. Henry Brady.
Radiolarians	Prof. E. Haeckel.

"Now the only foreigners in this list are Dr. Günther, Prof. Claus, Prof. Agassiz, Mr. Lyman, Prof. Oscar Schmidt, and Prof. Haeckel. If there is a better English authority than Dr. Günther on fishes, I beg his pardon for having overlooked him. The crustaceans were to have been done by the late Dr. v. Willmøes-Suhm and certain considerations come in as to the use of his plates and notes, which I need not discuss. I am not aware that there is any one in this country who can be considered at present an authority on recent Echinoidea. The choice perhaps lay between Agassiz and Lovén, but the reference collection at Cambridge is the best in the world in this department. There is, so far as I know, no English authority on Ophiurids at present. I prefer Oscar Schmidt's mode of treating the sponges to that of any other author. I am not aware that any Englishman knows the Radiolarians so well as Haeckel. There are a good many departments not yet settled, and one or two other foreigners may be added to the list. I should of course have most heartily asked your assistance with the corals had Moseley not undertaken them, but he has the preference as one of our staff, and he has done excellent work.

"I have submitted the principles on which I am working to the best of my ability to the Treasury, and they have received their sanction and that of the Council of the Royal Society. I cannot recognise the importance of the geographical distribution of naturalists, and with all respect for the dignity of British science I must say I think that in this selection, which I considered entirely open, I have done it ample justice.

"Believe me, very truly yours,

"C. WYVILLE THOMSON

"20, Palmerston Place, Edinburgh, March 27"

To this letter no reply has been received, and the subject might well have ended here.

The objectors to the course pursued by Sir Wyville Thomson would hardly advocate our assumption of a spirit more narrow and illiberal than that of any other country, and they will perhaps be interested in knowing how a foreign Government has acted under quite similar circumstances.

The results of the two great recent scientific expeditions fitted out in the United States, that of the "Haslar," and the Exploration of the Gulf Stream, have been distributed among special workers without any regard to nationality. Of this we need no further evidence than that afforded by the arrangements which have been adopted for the examination of the very rich collections made during the Gulf Stream Expedition. These collections have been allocated as follows:—

Halcyonaria	A. Kölliker	Würzburg.
Annelides	E. Ehlers	Göttingen.
Sponges (part)	O. Schmidt	Strassburg.
Sponges (part)	E. Haeckel	Jena.
Holothurians	E. Selenka	Leiden.
Polyzoa	F. A. Smitt	Stockholm.
Mollusca	J. Gwyn Jeffreys	London.
Hydroids	G. J. Allman	London.
Starfishes	E. Perrier	Paris.
Crustacea	Alph. Milne Edwards	Paris.
Fishes	F. Steindachner	Vienna.

Cephalopods	J. P. Steenstrup	Copenhagen.
Brachiopods	W. H. Dall	Washington.
Corals	L. F. Pourtales	Cambridge, U.S.
Ophiurans	T. Lyman	Cambridge, U.S.
Echini	A. Agassiz	Cambridge, U.S.

It will be thus seen that out of the twenty-two zoologists among whom the collections of the *Challenger* have been distributed *seventeen are English*; while out of the sixteen to whom the American collections have been assigned, *four are American*.

ELEMENTARY PHYSICS

Matter and Motion. By J. Clerk-Maxwell. (Society for Promoting Christian Knowledge. London, 1876.)

THE recent appearance of a swarm of elementary books on physics, some of which at least are written by well-known authors, leads to some very curious inquiries and speculations: for, though treating in the main of the same parts of the same subject as does the work we are specially dealing with, and addressed professedly to the same class of readers, they have comparatively little in common with it. To a certain, even a considerable, extent, this difference is of course due to the idiosyncrasies of the authors; but, after all allowance is made for these, there is still a most notable divergence. It will be both interesting and profitable carefully to consider in what this divergence consists, and what is its probable origin. For it is not too much to say that an intelligent reader of Clerk-Maxwell's book, had he no other source of information, would be utterly unable to answer any one of hundreds of questions which might be framed (without "dodge" or "trap") by a qualified examiner, *directly* from the text of the others. It is true that such questions would be artificial rather than natural—bearing more upon old and cumbrous dogmatic fallacies than upon the actual facts of science. But if the reader of Clerk-Maxwell's book would be at a loss when examined from any of the others, the student who relies merely upon one (or even *all*) of these would hardly even understand the meaning of a question put directly from Clerk-Maxwell's. The main origin of this divergence is to be found in the steady progress of knowledge in all departments of true science; even the most elementary. And, bearing this in mind, we may give an almost complete statement of the case by saying that Clerk-Maxwell's book properly belongs to the second half of the present century, while his rivals give us that of the first half only. These give us again the elementary "*Mechanics*" of our student days (more than a quarter of a century ago) very little changed—though where changed, often changed for the better—the first gives us what is emphatically the science of *to-day*. Possibly enough, in the beginning of the twentieth century even Clerk-Maxwell's book may appear a little antiquated; but it is hardly to be imagined that the text-book of that not very distant future will differ from Clerk-Maxwell's to anything like the extent to which that differs from its competitors. At least if there be anything like so a great difference it will depend upon some wholly new information as to the intimate nature of matter or energy, certainly not upon a mere difference in the mode of treatment.

The immense steps taken by Galileo and Newton (to mention only two of the chief workers) in the simplifi-