

THURSDAY, JUNE 16, 1897

## THE ENJOYMENT OF RESEARCH

WE are authorized to publish the accompanying list of the names 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 Sandwich 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. Brown.—For Correction of the Errors in the published Observations of the Colonial Magnetic Observations. 1902.

Dr. Joly.—For Experimental Investigations into the Mechanical Equations of Heat. 1902.

Prof. Barker.—For Assistance in Researches on the Morphology of the Vertebrate Skeleton and the Relations of the Nervous to the Skeletal System, chiefly in the Head. 1902.

Mr. W. H. Dallinger.—For Microscopic Investigations of Animals, Bacteria, and other Low Forms of Life. 1902.

Mr. F. J. Hille.—For compiling and publishing a Synopsis of the British Fossil Coproliths. 1902.

Prof. A. H. Green.—For Aid in preparing the Preface to an Exhaustive Treatise on the Anatomy of Birds. 1902.

Dr. Moore.—For compiling and publishing three Manuals:—(1) "Anatomy of the English," also with five plates;—(2) "Anatomy of the Birds of Paradise," also, three plates;—(3) "Ornithology of the Birds of Paradise," also, three plates. 1902.

Dr. H. Woodhouse.—For Continuation of Work on the Food Crustacea, especially with reference to the Tethyan and other Fossil Crustacea, and their Publication in the Volume of the Palaeontographical Society. 1902.

Prof. Schuchman.—For Continuation of Researches into (1) the Normal Parasites, (2) Schistosoma, (3) Ascaris. 1902.

Dr. H. E. Armstrong.—For Continuation of Researches into the Fossil Sponges, and into the Effect of Nitric Acid on Metals. 1902.

Prof. King and Kenyon.—For Researches in Determining the Structural, Chemical, and Microchemical Characters of a Certain Group of Crystalline Rocks represented in Geyser. 1902.

Mr. J. J. Harrison.—Towards the Expense of collecting and Describing Specimens of the Rocks of Charnwood Forest. 1902.

## NON-PERSONAL PAYMENTS.

In aid of Apparatus, Materials, and Assistance.

Dr. J. Kerr.—For aid in Electro-Optic and Magneto-Optic Researches. 1902.

Mr. J. E. H. Gordon.—For Experimental Measurements of the Specific Inductive Capacity of Dielectrics. 1902.

Prof. Guthrie.—For Apparatus and Assistance in (1) the Determination of the Latent Heat of the Crystallization of the Vapour of Trinitro-Toluene, and (2) the Examination of Heat Spores and Bacteria Heat by means of varying Electrical Resistance in Thin Wires. 1902.

Mr. J. T. Rowlands.—To aid in carrying out a Series of Experiments on Determining the Conductivity for Heat of Various Liquids and Solutions of Salts. 1902.

Dr. William Thomson.—For Assistance and Materials

for a Continuation of Experiments on the Effects of Stress in Magnetics. 1902.

Mr. W. Graham.—For Assistance in conducting his Researches connected with "Population resulting from Radiation." 1902.

Messrs. Richter and Thoms.—For a Comparison of the Air and Mineral Thermometers. 1902.

Mr. F. D. Brown.—For an Investigation of the Physical Properties, the Specific Gravity, Expansion by Heat, and Vapour Pressure, of the Homologous and Isomeric Liquids of the Ca-Hexyl Series. 1902.

Prof. Rowan.—For Continuation and Extension of the Experiments on the Spectroscopic Method of measuring the Chemical Action of Light. 1902.

Dr. William Thomson.—For Investigation and Analysis of Tidal Observations and Periodical Changes of Sea Level. 1902.

Dr. J. B. Delfour.—For the Expense of Illustrations for a "Monograph of the Parasitology." 1902.

Mr. H. T. Spence.—For Aid in publishing the "Zoological Journal." 1902.

Dr. J. C. McWhinney.—For Apparatus for a Research into the Population of Fishes. 1902.

Prof. Compton.—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 best instance, of establishing a Physiological Classification of the Elementary Bodies. 1902.

Dr. Brown.—For Researches into the Physiological Action of the most important Compounds of Mercury, and into the Action of certain Poisons, and for Apparatus. 1902.

Mr. E. A. Sabine.—To pay the Salary of an Assistant to give Mechanical Aid in Micrological and Zoological Research. 1902.

Dr. Nathan Sarsenon.—For an Investigation of the Normal Relation between the Activity of the Heat-producing Processes, and the Temperature of the Body. 1902.

Prof. Schuchman.—For continuation of Researches into (1) the Normal Parasites, (2) Schistosoma, (3) Ascaris. 1902.

Mr. W. S. Hamilton.—For Researches into the Photographic Spectra of Organic Substances, into the Photo-plates of Carbon, the Conditions under which Liquid Carbonic Acid is found in Rocks and Minerals, the Double Salts of Carbonic and Nitric, and for other Investigations, and for Assistance. 1902.

Dr. Hughark.—For a Research into the Origin of the Ore of Copper and (if possible) of Lead, their Mode of Formation, and the Chemical connection (if any) between the Ore and its Matrix. 1902.

Prof. Church.—For a Research into the colouring matters of Catein, of Red Beet, and for the Study of Plant Chemistry. 1902.

## 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 division of the scientific staff has been at great pains in endeavoring to secure the services of men most competent for the task, and we are sorry to hear 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 characterize as an unwarranted attack on Sir Wyville Thomson, and it is

with much regret that we observe an attitude of hostility to the mode of distribution which has been deemed most conducive to the separation 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 specialists in this country, a few have been placed in the hands of American and German workers; and it is this accumulation 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 as captivated with recent zoological research, must know that the foreign zoologists, to whom Sir C. Wyville Thomson has entrusted 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 unswerving naturalists 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 these 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 Editor of the *Journal* now in process of signature, which has already received the approval of the presidents and secretaries of the Royal, Linnean, and Zoological Societies, and of other leading men in the department of knowledge:—

"*Reply of the 'Challenger' Expedition.*"

"As in a letter upon this subject in the number of the *Journal of Natural History* for May last Dr. F. Martin Dumas, writing to the president of the Zoological Society, has stated that he speaks 'as the language of a very considerable number of members of learned societies,' we, the undersigned, wish to state that we do not agree to the statement issued by Dr. Dumas upon the manner in which Sir C. Wyville Thomson has distributed the specimens collected by the Challenger Expedition for distribution. In so far as we have had an opportunity of judging we are positively satisfied that Sir C. Wyville Thomson, in the arrangements which he has made as regards these collections, has acted conscientiously with the best interest of science.

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

" J. D. HOOKER,	W. H. FLORIN.
T. H. HUXLEY,	F. L. SILLIMAN.
CAROLUS DARWIN,	CAMERON SILLIMAN.
ST. GEORGE MUMFORD,	A. H. GARROD.
FRANCIS DART,	GEO. A. MENZIES.
EDW. HULL,	VERMICULET.
WILLIAM E. CHAPMAN.	

It is of importance that no misunderstanding should

arise 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. F. Martin Dumas before a word of hostile criticism had as yet shown itself in print.

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

"My DEAR Sir, WYVILLE THOMSON,

"You can hardly imagine the strong feeling of disappointment with which we are all, through a very large number of the naturalists and paleontologists 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 British, Canadian, and American, and a part of the Spanish collections in the expedition of the Challenger have been given to American and German naturalists for distribution, 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 friendly spirit of compromise. I need hardly state that I should not have taken this liberty if I had not been obliged to position which each nation is very deeply entitled to hold in the field of zoological science. Writing down as the part of every man whose capabilities as naturalist and paleontologist I am well aware of, I express that not my own opinion that in this distribution you certainly are not of personal acquaintance with English workers have led you astray. We recognize the great merits of those foreign gentlemen to whom you have sent collections and the resulting 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, when there is a vast of that power-accumulated English workers which will enable them to treat the subjects in the broadest sense, and to compare the recent and prehistoric fauna with history. There is no such delimitation. I am asked to urge upon you a reconsideration of the matter, and to leave a fair portion of work in the hands of Englishmen, giving the maximum of your own country. Assuring you that we appreciate your difficulties, and that we will stand by you in every way consistent with the dignity of English science, I am, Sir,

"Yours sincerely,  
(Signed) F. MARTIN DUMAS

"Sir C. WYVILLE THOMSON"

"My DEAR Sir, MARTIN DUMAS,

"I may ask you to consider this note as written in general personally, for I cannot, of course, in any way recognize the statement '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 solution.

"I take up my pen rather hesitatingly, 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 receipt and distribution of my goods within a certain time. I endeavoured to do so, and send me this (13th Nov.) which had most successfully satisfied me because their special study and were generally reported as satisfactory; and yet those within I know by experience to be likely to do the work within the time for which I was paid there, and to secure the specimens in good order to be lodged in the British Museum. In all cases where I considered that two conditions were likely fulfilled by Englishmen I so acted and fully recognized the great advantage of avoiding the risk of losing things abroad, but except for this consideration I could not see and see an objection, but rather the reverse, in making a great work of this kind entrusted more widely. The result, however, here, 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 Animals	—	—	Prof. TAYLOR
Birds	—	—	Dr. SOLMAN
Fishes	—	—	Dr. GILBERT
Cryptopods	—	—	Prof. HANLEY
Coelenterata	—	—	
Laminiferous	—	—	Bar. R. B. WATSON

Medicines .. .. .	Mr. Dardieu.
Higher Courses .. .. .	Probably Prof. Chau.
Germany .. .. .	Prof. G. Lindy.
France .. .. .	Mr. Henry Woodard.
Belgium .. .. .	Mr. Durin.
Sweden .. .. .	Dr. Holmberg.
Denmark .. .. .	Prof. Ray Lankester.
Spain .. .. .	Mr. Bosc.
Italy .. .. .	Mr. A. Agazzi.
Poland .. .. .	Mr. Lyman.
China .. .. .	Dr. Depierre and myself.
Hydroponics .. .. .	Prof. Albeau.
Japan .. .. .	Mr. M. Saito.
India .. .. .	Prof. Omer Steudt and myself.
Australia .. .. .	Mr. Hogg Smith.
South Africa .. .. .	Prof. R. Haasliel.

\* For the only foreigner in this list see Dr. Günther, Prof. Chau, Prof. Agazzi, Mr. Lyman, Prof. Omer Steudt, and Prof. Haasliel. It shows to a certain English authority than Dr. Günther on fishes, I beg his pardon for having overlooked him. The preference was to have been done by the late Dr. v. Willdenow-Rohr and certain considerations came in view thereof of his plans 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 animal zoözoölogy. The choice perhaps is between Agazzi and Lyman, but the references collected at Cambridge is the best in the world in this department. There is no one as I know, so English, authority on Ophiurida at present. I quote Omer Steudt's mode of treating the subject to the best of any other author. I am not aware that any Englishman here the Radiolarians so well as Haasliel. There are a good many departments not yet settled, and more two other foreigners may be added to the list. I should of course have more liberally cited your assistance with the most kind Ministry not understanding this, but he has the preference in one of our staff, and he has the greatest merit.

I have estimated the privileges on which I am working to the best of my ability in the Treasury, and they have received the sanction and that of the Council of the Royal Society. I must recognize the importance of the geographical distribution of minerals, and with all respect for the dignity of Britain since I must say I think that in this relation, which I considered entirely open, I have done it simply justice.

— Sir John Lubbock, 25, Whitehall Terrace.  
 \* in, Palmerston Place, Edinburgh, March 27.

To this letter an reply has been received, and the subject might well have ended here.

The objection to the course pursued by Sir Wylie Thomson would hardly advocate our assumption of a spirit more narrow and selfish than that of any other nation, 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 "Albatross" and the Expedition 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 manufacturing of the very rich collections made during the Gulf Stream Expedition. These collections have been allocated as follows:—

Albatross .. .. .	A. Walker .. .. .	Washington.
Albatross .. .. .	R. Edmon .. .. .	Philadelphia.
Spain (part) .. .. .	H. Schmidt .. .. .	Stromboli.
Albatross .. .. .	R. Hancock .. .. .	Paris.
Albatross .. .. .	R. Schmidt .. .. .	London.
Spain .. .. .	F. A. Suter .. .. .	Stockholm.
Albatross .. .. .	L. G. Jefferys .. .. .	London.
Albatross .. .. .	G. I. Alford .. .. .	London.
Albatross .. .. .	R. Parry .. .. .	Paris.
Albatross .. .. .	Alph. Milne Edwards .. .. .	Paris.
Albatross .. .. .	E. Deshayes .. .. .	Vienne.

Albatross .. .. .	J. P. Steenstrup .. .. .	Copenhagen.
Albatross .. .. .	H. M. Dall .. .. .	Washington.
Canada .. .. .	L. F. Peurichen .. .. .	Cambridge, U.S.
Albatross .. .. .	T. Lyman .. .. .	Cambridge, U.S.
Albatross .. .. .	A. Agazzi .. .. .	Cambridge, U.S.

It will be first 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

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

THE recent appearance of a volume 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 curiously 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 a hundred questions which might be framed (without "dodge" or "trap") by a qualified examiner, already from the text of the volume. It is true that such questions would be artificial rather than natural-looking (more upon old and centuries-degustic traditions 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 above, 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. There 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 out-of-date; but it is hardly to be imagined that the best book of that sort very distant future will differ from Clerk-Maxwell's in anything like the extent to which it differs from its competitors. At least if there be anything like so great a distance 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 discipline