Carnegie Institution of Washington.[1]

THE year 1921 marks the completion of the twentieth year of organised research conducted by the Carnegie Institution. The original aim of the Founder was to give encouragement and support to investigations or to constructive thought in any department of science, literature, or art, and it is gratifying to record the fact that at the end of this second decade, the function of research as an activity indispensable to civilisation and as a necessary prerequisite of progress, seems to have come into fuller recognition than at any previous time in history. Industrial and government agencies, as well as academic interests, have given to fundamental investigation a high place in the list of elements essential for advance. To-day one may say with confidence that no investment of funds or of personal effort can find a work of greater dignity and worth, or one which offers a future giving clearer evidence of abundant and continuing reward, than is open in the field of research.

The work of the Institution touches in one way or another upon nearly all of the principal fields of research, and the investigations have been very fruitful. They have been not merely contributions to knowledge, but they are also the basis for much research of application which goes immediately into human use. It is not necessary in a preliminary statement to do more than direct attention to some of the most significant results which have signalised certain phases of the work of the Institution in the past year.

It is doubtful whether any recent discovery in the physical sciences has attracted wider interest or has contributed more to the ultimate possibilities of astronomical and physical science than the measurement of diameter of a fixed star carried out at Mount Wilson Observatory three days after the annual meeting of the Institution last year. This long-desired result was made possible by many years of development of plant and technique, together with the extraordinary skill of Dr. A. A. Michelson and his associates and the clear vision of Dr. G. E. Hale in bringing together all of the elements required for this particular task. Measurement of the diameter of the star Betelgeuse once accomplished, the dimensions of other stars followed quickly. More recently, by a refinement of the original method, Dr. Michelson has opened the way for corresponding observations on a group of stars which seemed to be entirely out of range in the first use of the interferometer on the 100-inch telescope. The results already achieved give confirmation of much important work done by other astronomers and furnish a new starting-point for a great variety of investigations concerning the nature of the universe. In consideration of the critical problems involved, provision has been made for securing assistance and co-operation of other investigators, and Dr. H. N. Russell, of Princeton University, who has added much to our knowledge of the evolution of the stars, is now associated with Dr. Michelson and others in helping to solve the special problems to which Mount Wilson Observatory has given attention.

A significant event in the operations of the Institution is the completion within this year of a survey of the seas of the world by the non-magnetic ship *Carnegie*. Launched in 1909, this unique vessel has voyaged nearly 300,000 miles, covering the principal areas of the great oceans and securing data on magnetic conditions previously unavailable, which, with those obtained by concurrent studies on land, give a map of magnetic variations not hitherto possible. With the completion of the year's cruise by the *Carnegie*, and the summing up of its results, attention may be directed more particularly to land observations, to critical studies of terrestrial and atmospheric electricity, to experimental studies bearing upon the nature of magnetism, and to the assembly and interpretation of the great mass of data made available from all sources through many years of field work.

Beginning with the year 1921, the Department of Experimental Evolution and the Eugenics Record Office have come to function as an administrative unit known as the Department of Genetics. By this change, the biological studies of inheritance, based upon investigation of many groups of plants and animals, are brought to bear more directly on studies of human genetics conducted through the Eugenics Record Office. Important as knowledge of heredity is in its application to the development of the animals and plants which contribute to our needs, there is no group of questions more significant in the complicated organisation of human society than those concerning the meaning and the possibility of direction or control of inheritance in man. Without full understanding of the biological factors concerned, it might appear that intelligence and social organisation have brought relatively large opportunity for degeneration. On the other hand, adequate understanding of the principles governing the course of descent may give to mankind opportunity for more rapid and more advantageous development than has been known in the past lines of evolution of other organisms.

During the past year a modest chemical laboratory has been erected for the Department of Botanical Research at Carmel, California. This department has carried its work farther into the field of physical and chemical research in the effort to secure more information concerning the basis of plant activities. The new laboratory offers improved opportunity for fundamental work on photo-synthesis or the chemistry of compounds arising under the influence of light, and it is hoped that with present facilities a nearer approach to the solution of this difficult but fundamental problem in the physiology of plants may be obtained.

An important project in the purely humanistic field is that concerning the ancient Maya civilisation of Central America. The expedition of 1921, led into this region by Dr. S. G. Morley, has secured most significant new material by the study of the ancient monuments and the excavation of building sites. The story of this people contributes much that may become critical or determinative in the interpretation of early American history; the great bulk of this record still remains unread. In the past year the Institution has had the benefit of effective co-operation in this work by Mr. William Gates, whose study of both the modern and the ancient Maya language involves lines of investigation which should relate themselves closely to the archæological studies.

The more noteworthy of the allotments made by the Executive Committee during the past year were as follows: 14,000*l.* for the Department of Botanical Research, 25,000*l.* for the Department of Genetics, 28,000*l.* for the Geophysical Laboratory, 42,000*l.* for the Mount Wilson Observatory, and 46,000*l.* for the Department of Terrestrial Magnetism.

In addition, there were minor grants aggregating 30,000*l.*, and 20,000*l.* was allotted for the production of publications. The total allocations amounted to more than 250,000*l.*

[1] Extracts from the Report of the President of the Carnegie Institution of Washington, Year-book No. 20, 1921.

Since the foundation of the Institution in 1902 there has been distributed, chiefly by gifts to libraries and to authors, but to a noteworthy extent also by sales, a total of no less than 226,039 volumes of publications of the Institution. During the past year the publication of 23 volumes has been authorised by the Executive Committee at an aggregate estimated cost of 12,000*l.*, and 18 volumes, with an aggregate of 4068 octavo and 1398 quarto pages have been issued. Twenty additional volumes are now in press.

Melanesian Witchcraft.

AT a meeting of the Royal Anthropological Institute on Tuesday, May 23, Dr. B. Malinowski read a paper on Melanesian witchcraft. The natives of the Coral Archipelagoes surrounding New Guinea, where Dr. Malinowski carried out his researches, have no idea of natural death or disease. If undisturbed by sorcery, a man would, they believe, live in perpetual good health to an old age, in fact there is no reason why he should ever die.

When a sorcerer wishes to destroy a man, either as an act of personal hate or professionally for a payment, he first administers a small dose of black magic and produces a slight disorder. A spell in which the victim's name is mentioned is chanted over his house or garden, or into some leaves which are buried near his doorstep. The man sickens and is made more susceptible to further evil magic, which is now made stronger by the application of a more dangerous spell, and the pernicious substance must be administered by mouth or else burnt in the victim's hut. At this stage the patient takes all sorts of precautions; his house is guarded by relatives, his food is under control and, last though not least, he engages the services of another professional man—a sorcerer is always also a healer—who tries to undo by magical means all the evil done by his colleague. The sorcerer is most dreaded at night when he prowls round the victim's house, surrounded by night birds, his assistants, and tries to enter the hut and to burn the deadly substance.

If he succeeds, the patient may die, provided the good magic has not proved more effective than the evil. If he fails, the sorcerer may have recourse to the final rite of pointing the bone. A regular witch's cauldron is prepared and boiled somewhere in the jungle, and into its seething contents the sorcerer chants a most deadly spell, uttering the victim's name. Then he dips into the mess a pointed bone, a stingaree spine, or a short wooden dagger. Afterwards he steals to the village and tries to get sight of the victim without being seen himself. Pointing the dagger towards the man he jerks and twists it in the air, muttering the final incantation. The man to whom this is done will invariably die, unless a more effective magic has been used for his protection.

The sorcerer firmly believes in the powers of his black art. When he undertakes professionally to conduct a case, whether of killing or curing, he will carry out the various rites scrupulously, often risking his life in the attempt to kill by magic, for, if caught *in flagrante delicto*, he would be mercilessly speared.

It has to be realised that sorcery is almost invariably used to avenge some real injury or to punish some one who has broken the tribal law. The victim feels the weight of public opinion against him and this enhances greatly his natural fear of magic. It is important also to realise that black magic is generally used in carrying out the decrees of tribal law and usage, and that it is mainly at the disposal of the chief, the man of rank, and the man of wealth. It thus supplies savage society with the wholesome, though undoubtedly unpleasant element of fear, without which no social stability or order can exist in a primitive community. It is always a conservative force, which ranges itself on the side of existing order, authority, law, and custom. It is most unfortunate, therefore, that whenever European civilisation comes in contact with savages, the first thing done is to destroy, or at least undermine, the power of the black magician. It is one of the many cases where a mistaken zeal for giving savages that for which they are not yet ripe results in the disruption of their own social order and in paralysing their own powers, without the substitution of any effective means of control.

The late Dr. Rivers, in opening the discussion which followed the reading of the paper, referred to the value of Dr. Malinowski's investigations in indicating in particular the place taken by sorcery in the social complex as a whole. When examined in this relation, the resemblance which the sorcery of the Trobriands offers to the sorcery of other peoples as, for example, in the Western Solomon Islands, is merely superficial. Sir James Frazer pointed out the parallelism in the development of the arts and of witchcraft in the Trobriands, and indicated further that the theory which underlies this system of sorcery is mechanical in that the spirit acts upon, but did not enter into, the body.

New Buildings of University College, Nottingham.

THE foundation stone of the new buildings of University College, Nottingham, was laid on Wednesday, June 14, by Lord Haldane, in the presence of a large company from all parts of the East Midlands. The site is situated at the highest point of the Highfields estate, being about 2½ miles distant from the centre of the city. The present proposals include the central building, which provides accommodation for the faculties of arts and economics and also for the administrative offices. The library adjoins. There is also provided a block for the departments of chemistry and physics with room for extensions. The departments of biology and geology will be temporarily accommodated in the central building. The departments of engineering, mining, technology, and the evening work of the College will continue to be carried on in the present buildings in Shakespeare Street.

The new buildings at Highfields have been designed on the unit system in such a way that future development of the University is rendered possible. Provision is thus made for the ultimate transference of all departments to the new site. The erection of the new buildings has been made possible by the great generosity of Sir Jesse Boot. About two years ago he gave to the College the sum of 50,000*l.*, of which 20,000*l.* was to be devoted to the endowment of the chair of chemistry and 30,000*l.* to the building fund. He has now added a further sum of 120,000*l.* towards the latter purpose. At the ceremony on June 14, Lord Haldane announced that Sir Jesse Boot had sent a further cheque for 10,000*l.*, and that an anonymous donor had forwarded a cheque for 100,000*l.* in aid of the movement. These two cheques were put by Lord Haldane in the hands of the chairman of the University College. With this