

of the "manufactured diamond," since it differed in some respects from the specimens I have since received direct from Mr. Mactear.

The diamond excels all substances in hardness. Its crystals belong to the cubic system, and should not, therefore, present the property of doubly refracting light. Frequently, however, from the influence of strains within the crystal due to inclosed gas bubbles, or other causes, diamonds are not entirely without action on a ray of polarised light sent through them. Finally, the diamond is pure carbon, and, as such, burns entirely away when heated to a sufficiently high temperature in the air, and more vividly so burns, or rather glows away, when heated in oxygen gas.

The specimens I had to experiment upon were too light to possess appreciable weight, too small even to see unless by very good eyesight or with a lens, yet were, nevertheless, sufficiently large to answer the three questions suggested by the above properties.

A few grains of the dust, for such the substance must be termed, were placed between a plate of topaz—a cleavage-face with its fine natural polish—and a polished surface of sapphire, and the two surfaces were carefully "worked" over each other with a view to the production of lines of abrasion from the particles between them. There was no abrasion. Ultimately the particles became bruised into a powder but without scratching even the topaz. They are not diamond.

Secondly, some particles more crystalline in appearance than the rest were mounted on a glass microscope slide and examined in the microscope with polarised light. They acted each and all powerfully in the manner of a birefringent crystal. It seemed even in one or two of them that when they lay on their broadest surface (it can scarcely be called a "crystal-face") a principal section of the crystal was just slightly inclined to a flattish side of it in a manner that suggested its not being a crystal of any of the orthosymmetrical systems. Be that as it may, it is not a diamond.

Finally, I took two of these microscopic particles and exposed them to the intense heat of a table blow-pipe on a bit of platinum foil. They resisted this attempt to burn them. Then, for comparison, they were placed in contact with two little particles of diamond dust exceeding them in size, and the experiment was repeated. The result was that the diamond particles glowed and disappeared, while the little particle from Glasgow was as obstinate and as unacted on as before. I had previously treated the specimen I have alluded to as the first on which I experimented by making a similar attempt in a hard glass tube in a stream of oxygen, and the result was the same. Hence I conclude that the substance supposed to be artificially formed diamond is not diamond and is not carbon, and I feel as confident in the results thus obtained from a few infinitesimal particles that can barely be measured and could only be weighed by an assay balance of the most refined delicacy, as if the experiments had been performed on crystals of appreciable size.

Not content with merely proving what these crystalline particles are not, I made an experiment to determine something about what they are.

Heated on platinum foil several times with ammonium fluoride, they became visibly more minute, and a slight reddish white incrustation was seen on the foil. At the suggestion of Dr. Flight, assistant in this department, a master in the craft of the chemical analyst, these little particles were left for the night in hydrofluoric acid in a platinum capsule. This morning they have disappeared, having become dissolved in the acid.

I have, therefore, no hesitation in declaring Mr. Mactear's "diamonds" not only not to be diamonds at all, but to consist of some crystallised silicate, possibly one resembling an augite, though it would be very rash to assert anything beyond the fact that they consist of a

compound of silica, and possibly of more than one such compound.

The problem of the permutation of carbon from its ordinary opaque black condition into that in which it occurs in nature, as the limpid crystal of diamond is still unsolved. That it will be solved no scientific mind can doubt, though the conditions necessary may prove to be very difficult to fulfil. It is possible that carbon, like metallic arsenic, passes directly into the condition of vapour from that of a solid, and that the condition for its sublimation in the form of crystals, or its cooling into crystal diamond from the liquid state, is one involving a combination of high temperature and high pressure present in the depths of the earth's crust, but very difficult to establish in a laboratory experiment.

NEVIL STORY-MASKELYNE

FURTHER NOTES UPON THE PAPUANS OF MACLAY COAST, NEW GUINEA

I.

HAVING recently received from my friend M. von Miklucho Maclay, by way of Singapore, some further notes upon the ethnology of the Papuans of Maclay Coast, in New Guinea, I herewith contribute the following abstract of them to the pages of NATURE, as the periodical in which they were published is not readily accessible to English readers.¹

The Daily Life of the Papuans.—With regard to the application of pigment to the face and body, the Papuans paint the face with red and black colours, the red being such usually used by the young (those from fifteen to thirty years "malassi"), and the black by those of riper years. The young further use the colouring agents in the form of various devices. On ordinary days they are unpainted, or confine themselves to a ring round the eyes or a line along the nose, which goes to join another running from the temple to the vertex, over the shaved eyebrows. On formal occasions, however, the whole face is smeared with a pigment over which white and black are drawn. Sometimes half of the face is painted black, while the other half is red, which gives a very remarkable appearance. The Tamo, or men over thirty years old, almost never employ the real colour, but substitute black instead. On important occasions the whole head is covered with the pigment; in fact, in certain districts, e.g., "Kar Kar," Dampier Island, where this is abundant, the inhabitants smear the whole body with it, and with such care that it would be readily taken for their natural colour.

The women of Maclay coast are seldom to be seen painted, and, when they are, in not so elaborate a mode as are the men. A description has been already given of the *coiffure*. Before the arrival of Maclay bamboo knives and fragments of flint were used for the removal of the hair; but during his stay sherds of glass collected in the neighbourhood of his hut were substituted. Another method was also employed for the removal of single hairs by means of a noose made with a stalk of grass, in which the hair was twisted out of its follicle. Although this operation would seem to be a painful one, a Papuan has been seen engaged for three or four hours on this occupation, without a shade of an expression of pain being seen to pass over his features. Although the Papuans of this region are not conversant with the art of tattooing, they are accustomed to burn rows of scars in lines upon the skin. The operation is thus performed:—The patient having been placed either upon his back or belly, a red-hot fragment of dry bark is laid

¹ "Ethnologische Bemerkungen über die Papuas der Maclay-Küste in Neu Guinea—Alltägliches Leben der Papuas" (Fortsetzung). Reprinted from the *Natuurkundig Tijdschrift voor Nederlandsch Indië*, Zevende Serie, Deel vi. p. 294. (Batavia, 1876.) This abstract may be regarded as a continuation of two articles by me upon the same subject, which were published in NATURE, vol. ix. p. 323, vol. xiv. pp. 107, 136.—J. C. G.

upon the skin until it is entirely consumed to ashes, and so on with each mark. This procedure, too, must demand great patience and self-control. The women, curiously enough, ornament their bodies much less than do the men, their costume being not infrequently reduced to a minimum. In Billi-Billi, Maclay saw a marriageable maiden in the most singular costume that could possibly be conceived, consisting, as it did, of a single large shell (a white *Cypræa*) upon the lower part of the *mons Veneris*.

The men employ four or five hours in the combing of their hair and in smearing it with a decoction of the fruit of the *Súbari* (*Calophyllum inophyllum*), also in adorning it with feathers and flowers, and in painting their faces and backs. The only decorations, on the other hand, in which the females indulge on festal occasions is in a little dye with which they smear their hair, cheeks, and forehead, and a number of necklaces composed of shells of various sizes and gaily-coloured fruit kernels.

With regard to the social position of the women. Although it can hardly be said that the Maclay Coast Papuans ill-treat their wives, or that these latter have no influence upon the men, it is nevertheless the case that the women in almost every particular play an inferior rôle; for even when they are not overworked they have always enough employment throughout the year, while the men, with the exception of a few weeks spent in heavy work—the laying-out of plantations and cultivation of the ground—can for three-fourths of the time enjoy a *dolce far niente*. The women, moreover, have a worse diet, and dare not take their meals in company with the men, and in comparison with the latter wear scarcely any ornaments, nor do they take any part in their feasts.

Neither the marriage nor the birth of children are celebrated with any particular festal observance. Circumcision, on the other hand, is a somewhat important rite. This is performed at the age of twelve years, in the forest, at a distance from the village, and, as Zipporah did it, with a sharp flint, and after the ceremony the neophyte is escorted with songs back to the village. He is now no longer regarded as a boy, but as having come to man's estate, and enjoys, accordingly, many privileges which are not accorded to mere children.

The mode of salutation is somewhat laconic. When a neighbour comes into a village he says to the children, "*E-Wau!*" "Hey, children!" while the men and women are greeted respectively with a "*E-Nangeli!*" and "*E-Mem!*" "Hey, you women!" and "Hey, fathers!" The greeting of the Tamo among themselves is "*E-Aba!*" "Hey, brothers!" Relations, however, and friends are not accustomed to greet one another. The Papuans reach out their hands one to another, with a kind of movement, but without any mutual pressure. On departure the guest says "*Adi-angarmem,*" "I am going," to which the host and any others who may be present reply "*E-Aba,*" or "*E-Mem,*" and the guest answers in corresponding terms. Upon this the host says, "*Glembe*"—"Depart, then"—and escorts his guest as far as the entrance of the village, carrying with him the presents and the remnants of the feast. Hereupon the guest frequently remarks, "Stay you here, but I must be off." If the parting be of a particularly feeling character, one presses the other on the left side of the breast, embracing him at the same time with one arm, while with the other hand he pats him gently on the back. In the village Bogat, and in the Archipelago of Contentment, Maclay remarked that the people greeted a particularly honourable guest by squatting in a particular position on the ground.¹

The custom of mutual exchange of names is pretty widely spread throughout the coast, and Maclay was

¹ "Niederhocken." This position has been already described in the first paper on the Papuans of Maclay coast. NATURE, vol. ix. p. 329.

frequently begged to change his name with that of one of the natives whom he might have distinguished in some way or other. In order, however, to avoid any misunderstanding, he always refused this request, and only as a particular favour allowed his name, "Maclay," to be borne by the newly-born boys, whose fathers regarded themselves as his special friends. He was, moreover, frequently requested to choose a name for newly-born boys and girls.

As regards the treatment of the dead, the news of the death of a man is announced to the surrounding villages by a fixed succession of strokes on the *barum*. On the same or the next day the whole male population assembles in complete war equipment in the neighbourhood of the village. To the sound of the *barum* the guests stream into the village, and are awaited in the neighbourhood of the hut of the deceased by a crowd, likewise in warlike accoutrements. After a short palaver those present divide into two opposite camps, after which the performance of a sham fight takes place. They go to work, however, somewhat carefully in that they make no use of their spears; dozens of arrows, however, are shot off, so that not a few are somewhat seriously wounded in this make-believe encounter. The relations and friends of the deceased seem in particular to get excited and behave like madmen. After all are tired out, and all arrows have been shot away, the *quasi* enemies sit down in a circle and comport themselves merely as lookers-on. The nearest relations of the deceased then bring a pair of mats and the sheaths of the petioles of the fronds of the sago-palm, and lay them in the midst of the open space. Next they bring the corpse out of its hut, maintained in the stooping posture, with the chin resting upon the knees, and the arms embracing the legs, by means of strips of rattan. Close to the corpse are placed its property, gifts of its neighbours, and a couple of bowls (*tabir*) full of freshly-cooked food, while the men sit in a circle round the open space, the women, but only those nearest related to the deceased, merely look on at a distance. The corpse is then, with great neatness and art, wrapped in the mats and palm leaves, and tied up fast with a quantity of rattan and lianas, so that the whole finally resembles a well-made parcel. This, after being fastened to a strong stake, is brought into the hut and the stake is fastened under the roof; finally, after arranging all the property, presents, and food in the neighbourhood of the corpse, the guests leave the hut and return to their respective villages.

Some days later, when the corpse has become very decomposed, it is buried in the hut itself, a proceeding which in no wise hinders the relations from continuing to use it as a dwelling-place. About a year afterwards the skull is dug up and separated from the body of the corpse; but it is not the whole skull, but only the lower jaw which is preserved, and that by the nearest relation of the deceased, being carried, not infrequently, in the *gun*, or worn as a kind of armband.² This bone is most carefully preserved as a *souvenir* of the deceased, and it was only by the help of much persuasion, backed by numerous presents, that Dr. M. Maclay prevailed upon its possessor to part, under the seal of secrecy, with this treasured memento. The burial of a child or of a woman is attended with much less ceremony, being heralded by the sound of no *barum*, and accompanied by no assembly of neighbours, nor martial pomp and circumstance.

² This is not the only instance of the bones of the dead being worn by their surviving relatives. For instance, the Tasmanians (*vide* NATURE, vol. xiv. p. 211), according to Dr. Barnard Davis, carry as necklaces fragments of the bones of their relatives; and it is moreover stated by Prof. Allen Thomson, that the widows among the Andaman Islanders—the Mincopies according to Dr. B. Davis—actually wear the skulls of their late husbands upon their shoulders (NATURE, vol. xiv. p. 489). Prof. Flower, in a recent lecture on ethnology at the Royal College of Surgeons, showed the skull of an Andamanese man, to which was attached a very elegant webbed sling by which it had been suspended from the neck of the widow.—J. C. G.

With regard to the language and dialects. This study was attended with great difficulty because there was at hand no go-between who could play the part of a mutual interpreter, for the terms which were required could only be learnt either by pointing to the corresponding object, or through such signs as would be employed in barter. These two methods were, however, the source of many misunderstandings and mistakes, for the same object was variously named by different people, and for weeks Maclay was uncertain as to which term was the correct one. Here is an instance of what frequently happened. Dr. Maclay showed a leaf, hoping to arrive at its name, a native mentioned a name, which was forthwith written down; another Papuan gave another name on being shown the same thing; a third, fourth, and fifth, each gave a different word. Which out of all these was the proper name of the leaf in question?

After a time and by degrees it was discovered that the word first mentioned was the proper name of the plant to which the leaf belonged, the second betokened its colour, e.g., *green*, the third *dirt* or *useless*, probably because the leaf had been picked up from the ground, or belonged to a tree not turned to account by the Papuans. And so it came to pass with many words with abstract expressions and such as could not be explained by signs. Maclay, too, had obviously greater difficulties, for instance, how to inquire the equivalent word for "friend," and that for "friendship," and it was only after the lapse of four months that the corresponding word to "seeing" was arrived at, but as to the equivalent of "hearing," this was never come upon. The writing down of words was involved in further difficulties; there were certain tones of the Papuan language which were absolutely impossible to imitate. This Maclay rightly attributes to fundamental differences in the anatomical structure of the larynx and the whole muscular system of the organ of speech in the two races. Not only the organ of speech but also that of hearing plays an important part, for the same word may be heard in a totally distinct manner by different individuals. There is, too, in the denotation of the words of such a tongue quite a series of sources of fallacy—(1) the aborigines have not the same pronunciation; (2) the translator hears the words with his individual organ of hearing; (3) previously to writing it down he pronounces it with his individual organ of speech; (4) and finally, after pronunciation, the foreign word must be expressed in the characters of a known language. Nearly every village on Maclay Coast has its peculiar dialect, and these vary so much, that when making an excursion of two or three days, M. Maclay required the assistance of two, and even three, interpreters. It is only the old who understand two or three dialects, and it not infrequently happens that young persons do not know words of their own dialect, in which case they resort for information to some old Papuan. From this it may come to pass that upon the death of elders new words must be brought out by the young and introduced into the vocabulary. On the other hand the Papuans are fairly quick at learning a new language, consequently there are now to be heard on Maclay Coast a number of Russian equivalents for such words as axe, knife, nail, &c. The names of various birds are founded upon the cry which they utter. There are, moreover, among the dialects of Maclay Coast a number of Malayo-Polynesian words.

J. C. GALTON

(To be continued.)

JAMES R. NAPIER, F.R.S.

MANY cultivators of science, both at home and abroad, more especially those engaged in engineering and shipbuilding, will deeply regret to learn of the decease of Mr. James R. Napier, F.R.S., the eldest son of the late Mr. Robert Napier of Shandon, the eminent pioneer of the shipbuilding and marine engineering industries of the Clyde. The sad event occurred on Saturday, the

13th ult., at his house in Glasgow, after an illness which had confined him to his room for about three weeks. His health had been very unsatisfactory, however, for a number of years, and, with the view in a great measure of securing a better bodily condition, he had travelled a good deal—to Australia, twice to America, several times up the Mediterranean, wintering once at Malta, and on another occasion at Madeira, where he had the melancholy satisfaction of having as a brother invalid the late Prof. W. K. Clifford.

Born in the year 1821, and educated at the High School of Glasgow, Mr. Napier studied mathematics under Dr. James Thomson (Sir William Thomson's father), natural philosophy under Dr. W. Meikleham (Sir William's immediate predecessor), and practical astronomy under the late Prof. J. P. Nichol.

When quite a young man he was installed in his father's shipbuilding yard at Govan in a responsible position, having had, however, an excellent practical training in the workshop under the late David Elder, a man who did much to train the present race of mechanics who have since secured prominent positions in their profession. By and by the firm of Robert Napier and Sons was constituted, the sons being the deceased and his brother John; and the firm eventually attained a position in connection with marine engineering and naval architecture that has never been excelled in the annals of steam navigation. About twenty years ago Mr. James R. Napier retired from the firm, and for a time he conducted a shipbuilding business of his own, when he availed himself of the opportunity of putting into practice a number of his most advanced notions in ship construction. But it would seem as if he was not destined to shine as a man of business, being very unlike his father in this respect. During his subsequent career he occasionally executed a number of commissions in connection with matters in which his special knowledge could be profitably turned to account, and much of his time was devoted to scientific pursuits.

From time to time Mr. Napier communicated many interesting papers to learned societies with which he became connected. One of those bodies was the Philosophical Society of Glasgow, which he joined in the year 1850, when its presidential chair was filled by Dr. Thomas Thomson, F.R.S., the eminent chemist and mineralogist. In 1855 he became a life member of the British Association, on the occasion of its second meeting in Glasgow, and he long took a deep interest in its affairs, by serving on special committees, and otherwise. He was one of the founders, and subsequently president, of the Institution of Engineers in Scotland (now Institution of Engineers and Shipbuilders), the birth of which took place in 1857, with Prof. Rankine as the first president. When the Institution of Naval Architects was formed in the year 1860, he became a member, and was honoured by a seat in its first council.

Following the example of Prof. Roscoe in Manchester, a number of people of scientific proclivities, a few years ago, originated the Glasgow Science Lectures Association, the first lecture of which was, appropriately, delivered by Roscoe himself. The movement in Glasgow met with very hearty co-operation from the deceased. His sympathy with scientific progress was shown in a great variety of ways; and as an inventor who had often to apply to the Patent Office, he was leagued with Sir William Thomson and others in the recent movements for bringing about a comprehensive reform of the patent laws.

One of the leading features of Mr. Napier's career was the unbroken intercourse, personal and professional, which was maintained between him and Prof. Rankine. They had numerous joint undertakings in experimental investigation, and each was of very great service to his fellow, and in the end to science. As might well be understood, to no person was Rankine's too early decease a greater loss than to James R. Napier. JOHN MAYER